Critical Release Notice

Publication number: 297-5161-022
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The content of this customer NTP supports the SN07 (DMS) software release.

Bookmarks used in this NTP highlight the changes between the baseline NTP and the current release. The bookmarks provided are color-coded to identify release-specific content changes. NTP volumes that do not contain bookmarks indicate that the baseline NTP remains unchanged and is valid for the current release.

Bookmark Color Legend

Black: Applies to new or modified content for the baseline NTP that is valid through the current release.

Red: Applies to new or modified content for NA017 that is valid through the current release.

Blue: Applies to new or modified content for NA018 (SN05 DMS) that is valid through the current release.

Green: Applies to new or modified content for SN06 (DMS) that is valid through the current release.

Purple: Applies to new or modified content for SN07 (DMS) that is valid through the current release.

Attention!
Adobe® Acrobat® Reader™ 5.0 or higher is required to view bookmarks in color.

Publication History

August 2005

Standard release 11.05 for software release SN07 (DMS).

Volume 1

Modified Chapter 20, new section 20.5, for CR Q00986216-01.

December 2004

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Volume 1

Modified Chapter 2 for CR Q0823552-02.

Volume 2

Modified Chapter 40 and Chapter 43 for CR Q0823552-02.

September 2004

Standard release 11.03. This issue is valid for software release SN07 (DMS), although no changes have been made for SN07 (DMS) features.

Changes with respect to standard release 11.02 are as follows:

Volume 1

Chapter 4, Agent support modified according to CR Q00893694

Volume 2

No changes

Volume 3

Chapter 13, OM group AIN modified according to CR Q00765666.
Chapter 14, OM group AINICOFF modified according to CR Q00765666.
Chapter 15, OM group AINICSUB modified according to CR Q00765666.
Chapter 17, OM group AINOGOFF modified according to CRs Q00765666 and Q00527425-04
Chapter 19, OM group AINOGSB2 modified according to CRs Q00765666 and Q00527425-04
Chapter 21, AIN message tracing tool, 21.3 Supported messages and parameters, Table 913 modified according to CR Q00527425-04.

Chapter 23, TSTQUERY tool, 23.3 Supported messages and parameters, Table 933 modified according to CR Q00527425-04.

March 2004

Standard release 11.02 for software release SN06 (DMS). Changes were made to the following sections:

Volume 1

Chapter 2, Development Summary
Chapter 3, Call Model
Chapter 4, Agent support
Chapter 5, Functional overview
Chapter 6, Generic SSP procedures
Chapter 8, Originating call model events
Chapter 9, Terminating call model triggers
Chapter 14, STR processing with an SSP resource
Chapter 16, STR connection to a remote IP
Chapter 17, Connect_to_Resource
Chapter 19, Error handling
Chapter 20, Limitations
Chapter 22, AIN/DMS-100 interactions (A and B)
Chapter 23, AIN/DMS-100 interactions (C)
Chapter 24, AIN/DMS-100 interactions (C)

Volume 2

Chapter 1, AIN/DMS-100 interactions (I to R)
Chapter 2, AIN/DMS-100 interactions (S to Z)
Chapter 4, Other interactions
Chapter 8, Engineering considerations for PRI looparounds
Chapter 10, Data schema
Chapter 11, Software optionality control
Chapter 12, Datafilling for the general office
Chapter 14, Trigger group provisioning interface
Chapter 15, Trigger item provisioning interface
Chapter 39, Trunk Group Trigger
Chapter 41, Analyze_Route response
Chapter 46, Forward_Call response

Volume 3

297-5161-022

DMS-100 Family

Advanced Intelligent Network Service Enablers

Service Implementation Guide Volume 1 of 3

SN06 (DMS) Standard 11.02 March 2004

NORTEL NETWORKS™

DMS-100 Family

Advanced Intelligent Network Service Enablers

Service Implementation Guide Volume 1 of 3

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March 2004

Version 11.02 represents the second issue of the standard version of the SN06 AIN Service Enablers Service Implementation Guide (SIG).

September 2003

Version 11.01 represents the standard version of the SN06 AIN Service Enablers Service Implementation Guide (SIG).

December 2002

Version 10.01 represents the standard version of the NA018 AIN Service Enablers Service Implementation Guide (SIG).

July 17, 2002

Version 09.02 (revision AJ01) represents the Gate 2 standard version of the NA017 AIN Service Enablers Service Implementation Guide (SIG).

Note that there was no version of this document released for NA016. NA016 material is incorporated in this version.

March 2, 2001

Version 08.01 (revision AI01) represents the Gate 2 draft version of the NA015 AIN Service Enablers Service Implementation Guide (SIG).

September 5, 2000

Version 07.02 (revision AH02) represents the Gate 3 standard version of the NA014 AIN Service Enablers Service Implementation Guide (SIG).

May 4, 2000

Version 06.02 (revision AG06) represents the Gate 3 final standard version of the NA013 AIN Service Enablers Service Implementation Guide (SIG). Version 06.02 includes design and test verification team updates, and Gate 3 ProSTAR solutions.

September 17, 1999

Version 05.03 (revision AF11) represents the Gate 3 final standard version of the NA012 AIN Service Enablers Service Implementation Guide (SIG).

Version 05.03 includes design and test verification team updates, and Gate 3 ProSTAR solutions.

About this document

When to use this document

This document is the primary source of information for the DMS-100 SSP AIN Service Enablers product.

The document is a response to a customer request that Nortel Networks consolidate descriptive information into one document. This document maintains the nature of the documents most frequently used in the past, especially those related to provisioning the AIN Service Enablers SSP for triggers, responses, and post-response translations.

Electronically stored documents

For each electronically stored version of this document, there is one electronic master copy that is accessible to all approved users. All other copies, hard or soft, are considered uncontrolled.

How to check the version and issue of this document

The version and issue of the document are indicated by numbers, for example, 01.01.

The first two digits indicate the version. The version number increases each time the document is updated to support a new software release. For example, the first release of a document is 01.01. In the next software release cycle, the first release of the same document is 02.01.

The second two digits indicate the issue. The issue number increases each time the document is revised but released again in the same software release cycle. For example, the second release of a document in the same software release cycle is 01.02.

To determine the version of this document that applies to the software in your office and how documentation for your product is organized, check the release information in *Product Documentation Directory*, NTP 297-8991-001.

Structure of this document

The document is structured as follows:

Volume 1, Part I: Introduction. This part provides an overview of the AIN Service Enablers product, including the call model and agent support. This part also provides a product developments summary since NA007.

Volume 1, Part II: Functional Description. This part provides a functional overview of:

- AIN Service Enablers
- the generic SSP procedures
- supported triggers and events
- the Send_To_Resource interface to the Intelligent Peripheral (STR-IP)
- SCP messaging
- use of AIN Service Enablers for toll-free service

Volume 1, Part III: Interactions. This part lists and describes general trigger and event interactions, and AIN Service Enablers interactions with AIN Essentials, STR-IP, toll-free service, and Automatic Code Gapping (AGC).

Volume 2, Part I: Planning and Engineering. This part describes AIN hardware requirements and outlines the technical specification such as standards, performance measurements, capacity allocation, messaging requirements, and error handling.

Volume 2 Part II: Provisioning. This part contains the provisioning information that was formerly in the Provisioning Cookbook and the Response Translations Guide. These documents were incorporated into the same format for this document. The chapters in this section provide examples of trigger, response, and post-response translations datafill.

Volume 3, Part I: Billing. This part describes Automatic Message Accounting (AMA) as it applies to AIN and illustrates the module codes.

Volume 3, Part II: Operations, administration and maintenance. This part describes OMs and logs that are supported by AIN Service Enablers, and also describes the network management feature called Automatic Call Gapping. Several chapters in this part provide information on the command interface (CI) tools for this product.

Volume 3, Part III: Requirements. This part presents the mapping of AIN Service Enablers to the Bellcore specifications, and describes some elements of product support.

Document scope

This document describes AIN Service Enablers in terms of Functional Sets (FS) and Functional Subsets (FSS).

FS and FSS example

The following example illustrates how FS and FSS definitions help describe AIN Service Enablers functionality.

The Network_Busy Event FS represents the function of a particular event, the Network_Busy (NB) event, and consists of the following FSSs:

- NB Event Detection and Processing FSS, to let the SSP detect the event
- Network_Busy Event Request Message and Processing FSS, to let the SSP generate a query message to the SCP
- Generic Analyze_Route Message and Processing FSS, to let the SSP process one of the possible responses from the SCP
- Disconnect Message and Processing FSS, to let the SSP process another of the possible responses from the SCP

Notice that the NB Event Detection and Processing FSS is specific to the FS. It provides an integral unit of AIN functionality that enables a unique service-related feature.

Other FSSs, such as the Generic Analyze_Route Message and Processing FSS and the Disconnect Message and Processing FSS, are used by other FSs.

FS and FSS definitions

FSs and FSSs are groups of functionally associated requirements for the Service Switching Point (SSP), the SSP/SCP interface, and the SSP/IP interface. The elements of an FSS or FSSs contribute to a common purpose or action (functionality). FS and FSS definitions comply with Bellcore documents GR-1298, GR-1299 and GR-1129, as well as toll-free service document GR-2892.

An FSS possesses an integral unit of AIN functionality that either enables a unique service-related feature on an SSP, or provides a common base for other functional groups. Each FSS is a group of specifically related Bellcore requirements.

An FS consists of several FSSs and represents a stand-alone function, such as an event, or a building-block used to create a stand-alone function, such as a generic message processing.

Document structure and organization

Major sections or chapter titles in this document comply with the FS that is being implemented. Subsections comply to the FSSs within that FS. Subsections can also contain additional information that is not included in the FSSs.

Structure and organization example

In keeping with FS definitions, this document describes events in two chapters; one for the originating call model and one for the terminating call model.

Section 8.3 , "Network_Busy event," on page 383 describes the Network_Busy event, which implements the Network_Busy Event FS. Chapter 8 contains one section for each event it describes. Since each event implements an FS, the chapter has a section for each FS.

The Network_Busy event section contains six subsections:

- Arming the Network_Busy event
- NB event detection and processing
- Network_Busy event request message and processing
- Analyze_Route message and processing
- Disconnect message and processing
- Send_To_Resource message and processing

Each subsection represents either an FSS that makes up the FS, or additional information.

References in this document

The following documents are referred to in this document:

- 297-1001-455, *Office Parameters Reference Manual (volumes 1, 2)*
- 297-1001-825, *DMS-100 Glossary*
- 297-1411-350, *E911 Emergency Service*
- 297-1421-010, *Subscriber Services Product Guide*
- 297-2051-104, *MDC SMDI Setup and Operation*
- 297-2401-360, *ISDN Primary Rate Interface Translation Guide*
- 297-5161-021, *Advanced Intelligent Network Essentials Service Implementation Guide*
- 297-5161-510, *AIN Release 0.1 SSP Complete Maintenance Guide*
- 297-8003-350, *North American DMS-100 Translations Guide*

- 297-8003-808, *North American DMS-100 Service Order Reference Manual*
- 297-8003-814, *North American DMS-100 Operational Measurements Reference Manual*
- 297-8003-840, *North American DMS-100 Log Reports Reference Manual*
- 297-8003-855, *NA DMS-100 Office Parameters Reference Manual*
- 297-8981-021, *DMS-100/200 LRN-LNP Service Implementation Guide*

What precautionary messages mean

The types of precautionary messages used in Nortel Networks documents include attention boxes and danger, warning, and caution messages.

An attention box identifies information that is necessary for the proper performance of a procedure or task or the correct interpretation of information or data. Danger, warning, and caution messages indicate possible risks.

Examples of precautionary messages follow.

ATTENTION Information needed to perform a task

> **ATTENTION**
> When the unused DS-3 ports are not de-provisioned before a DS-1/VT Mapper is installed, the DS-1 traffic will not be carried through the DS-1/VT Mapper, even though the DS-1/VT Mapper is properly provisioned.

CAUTION Possibility of service interruption or degradation

> 
>
> **CAUTION**
> Possible loss of service
> Before continuing, confirm that you are removing the card from the inactive unit of the peripheral module. Subscriber service is lost when you remove a card from the active unit.

DANGER Possibility of personal injury

DANGER
Risk of electrocution
Do not open the front panel of the inverter unless fuses F1, F2, and F3 have been removed. The inverter contains high voltage lines. Until the fuses are removed, the high voltage lines are active, and you risk being electrocuted.

How commands, parameters, and responses are represented

Commands, parameters, and responses in this document conform to the following conventions.

Input prompt (>)

An input prompt (>) indicates that the information that follows is a command:

>BSY

Commands and fixed parameters

Commands and fixed parameters that are entered at a MAP terminal are shown in uppercase letters:

>BSY CTRL

Variables

Variables are shown in lowercase letters:

>BSY CTRL ctrl_no

The letters or numbers that the variable represents must be entered. Each variable is explained in a list that follows the command string.

Responses

Responses correspond to the MAP display and are shown in a different way:

FP 3 Busy CTRL 0: Command request has been submitted.

FP 3 Busy CTRL 0: Command passed.

The following excerpt from a procedure shows the command syntax used in this document:

Busy the CTRL on the inactive plane by typing the following

>BSY CTRL ctrl_no

and then press the Enter key.

where

ctrl_no is the number of the CTRL (0 or 1)

Example of a MAP response:

```
FP 3 Busy CTRL 0: Command request has been submitted.
FP 3 Busy CTRL 0: Command passed
```

Part I Introduction

Part I: “Introduction” consists of the following:

Chapter 1:“Product overview”

Chapter 2:“Development summary”

Chapter 3:“Call model”

Chapter 4:“Agent support”

1 Product overview

This document refers to two of Nortel Networks' AIN products for the DMS-100 service switching point (SSP):

- AIN Essentials
- AIN Service Enablers

This chapter defines each of these products in terms of the Bellcore specifications they implement.

1.1 AIN Essentials

AIN Essentials is a Nortel Networks AIN DMS-100 SSP product used to offer AIN Essentials functionality to operating companies. Most of the AIN Essentials functionality complies with the following:

- *Advanced Intelligent Network (AIN) 0.1 Switching Systems Generic Requirements.* TR-NWT-001284, Issue 1. Bellcore, August 1992.
- *Advanced Intelligent Network (AIN) 0.1 Switch—Service Control Point (SCP) Application Protocol Interface Generic Requirements.* TR-NWT-001285, Issue 1. Bellcore, August 1992.

Product release BCS36 introduced the AIN Essentials product.

1.2 AIN Service Enablers

AIN Service Enablers is another AIN DMS-100 SSP product that offers AIN 0.2 functionality to operating companies. Most of the AIN 0.2 functionality complies with the following:

- AIN Telcordia specification GR-1298-CORE Issue 7 (GR1298) and GR-1299-CORE Issue 7 (GR1299)
- GR-1298-CORE, *AINGR: Switching Systems*, Issue 5, Bellcore
- GR-1298-CORE, *AINGR: Switching Systems*, Issue 5, Bellcore
- GR-1299-CORE, *AINGR: Switch—Service Control Point (SCP)/Adjunct Interface*, Issue 5, Bellcore

- GR-1299-CORE, *AINGR: Switch—Service Control Point (SCP)/Adjunct Interface*, Issue 5, Bellcore
- GR-1129-CORE, *AINGR: Switch—Intelligent Peripheral Interface (IPI)*, Issue 2, Bellcore, July 1996
- GR-1298-ILR, *Advanced Intelligent Network (AIN) Switching Systems Issues List Report,* Bellcore
- *GR-2892-CORE, Switching and Signaling Generic Requirements for Toll-Free Service using Advanced Intelligent Network*, Issue 1, Bellcore, April 1995

Note 1: In AIN Service Enablers, trigger Specific_Digit_String (SDS) is equivalent to AIN Essentials' trigger public office dial plan (PODP). Because both triggers share the same provisioning, TRAVER and other provisioning tools use the term PODP to refer to AIN Service Enablers' trigger SDS.

Note 2: In AIN Service Enablers, trigger Public_Feature_Code (PFC) is equivalent to AIN Essentials' trigger PODPFeat. Because both triggers share the same provisioning, TRAVER and other provisioning tools use the term PODPFeat to refer to AIN Service Enablers' trigger PFC.

2 Development summary

This chapter describes the DMS software activities required to develop the AIN Service Enablers SSP product. Nortel Networks will develop this product over several releases. Product release NA007 introduced the first AIN Service Enablers SSP product.

2.1 What's new in SN06

This section provides an overview of the SN06 content for AIN Service Enablers. Use this content for information purposes only. Nortel Networks reserves the right to change the scope of the work or limits of the software functionality.

SN06 AIN development provided the following activities:

- TRMT Selector Support for Primary Trunk Group (A59040114)
- QAIN - Query AIN subscription data (QAIN)
- TCAPNM Calling Name Delivery After AIN TAT/AT on originating PTS trunk (TCAPNMTAT)
- Trigger at Treatment (Trig_at_TMT)
- OriginalCalledPartyid / RedirectingPartyid Parameter Support (REDIRECTION_FRAMEWORK)

AIN Service Enablers for SN06 is based on the following specifications:

- AIN Telcordia specification GR-1298-CORE Issue 7 (GR1298) and GR-1299-CORE Issue 7 (GR1299)

2.1.1 TRMT Selector Support for Primary Trunk Group (A59040114)

The AIN Response package can provide a set of route lists and carrier that are used by the SSP to identify the applicable route and complete the call. The route lists and carriers provided are:

- Primary Trunk Group
- Alternate Trunk Group
- Secondary Alternate Trunk Group

- Carrier
- Alternate Carrier
- Secondary Alternate Carrier

These Trunk Group indices map onto route list tuples in Office Route tables such as OFRT, IBNRTE, IBNRT2. Analyze_Route and Forward_Call are the two AIN responses that can support Trunk Group information.

AIN supports a subset of route list selectors available in Office Route tables. This activity supports the TRMT route selector if it is present in the selected Primary Trunk Group route list. This activity also allows the SSP to select any available route list elements provided by the SCP, if applicable, discarding the TRMT selector.

2.1.1.1 Limitations

None

2.1.1.2 Optionality

TRMT Selector Support for Primary Trunk Group is controlled by the existing Release 11 Base SOC - AIN0006.

2.1.2 QAIN - Query AIN Subscription Data (QAIN)

This activity implements the CI command QAIN.

The functionality of the QAIN command is to:

- Display the AIN/AINDN options associated with a DN/LEN/customer group/trunk group/office for TRIGGRP as well as TRIGITM data models.
- Display the AINDENY options subscribed by the DN/LEN and customer group.
- Display the number of lines in a customer group which are subscribed to AIN/AINDN and AINDENY separately.

The QAIN command also supports multi user compatibility. Multiple instances of the tool can be run in a switch.

2.1.2.1 Limitations

None

2.1.2.2 Optionality

QAIN (Query AIN Subscription Data) is controlled by SOC AIN0006 - Call Management.

2.1.3 TCAPNM Calling Name Delivery after AIN TAT/AT on originating PTS Trunk (TCAPNMTAT)

This activity facilitates deployment of services based on AIN 0.2 platform. The feature enables the DMS SPP to use a Calling Party DN provided in a CallingPartyID parameter of the Authorize_Termination AIN SCP response for calls originated over PTS trunks, as per requirements of the TR-NWT-001285 document (R) - 2.6 -239.

In order to comply with TR-1188 and AIN 0.2 release requirements the CallingPartyID provided by an SCP response, instead of an originating party DN, is used in the query sent to the Residential Centralized DataBase in order to get the name associated with the SCP provided CallingPartyID. The retrieved name is displayed on the terminating party's CLASS set. The called party subscribes to both AIN 0.2 TAT/AT and the TCPNM CNAMD features.

2.1.3.1 Applicability

With the AIN 0.2 service, the Termination_Authorize (TAT) query is sent to the AIN SCP when an attempt is made to terminate to the called party. The AIN SCP instructs the terminating switch to connect to the Intelligent Peripheral (IP), which plays announcements and prompts the originator for the calling party pin. The IP collects the calling party pin and sends it to the AIN SCP, which then sends the Authorize_Termination response message with the CallingPartyID parameter to the terminating switch called party. The TCAPNM activity uses the CallingPartyID parameter to display the calling party name.

The centralized residence name database provides a name of up to 15 characters in length and a permanent privacy indicator. The information retrieved from the database is passed back to the terminating switch in a TCAP response package. When the Calling Number Presentation Indicator is "Allowed" and the name is available in the TCAP Database, the name is delivered to the called TCAPNM subscriber. Otherwise an unavailable indication is given.

When the existing TCAPNM sub-option is set to LOCAL, the calling name is either retrieved from the local DMS database or captured from the Party Info Parm (PIP) parameter of ISUP IAM. When the TCAPNM sub-option is set to NONLOCAL, the default value, the Local Lookup feature is turned off and CNAM is executed accordingly.

When office parameter TCAP_INTERLATA_QUERY in table OFCVAR is set to Y(es), both intraLATA and interLATA calls perform TCAP queries when necessary. When this parameter is set to N(o), its default value, only intraLATA calls perform TCAP queries.

2.1.3.2 Limitations

None

2.1.3.3 Optionality

The TCAPNM Calling Name Delivery after AIN TAT/AT on originating PTS Trunk activity is controlled via SOC option AIN00310.

2.1.4 Trigger at Treatment (Trig_at_TMT)

This activity supports triggering when treatment is encountered during the Analyze Route (AR) response from the SCP.

When the call cannot route over the carriers selected from the SSP-based carriers, the call routes to treatment. When an Interlata number attempts to route over a Local Exchange Carrier (0110), trigger analysis is performed. If no trigger is detected, then the call routes to treatment.

2.1.4.1 Limitations

None

2.1.4.2 Optionality

This functionality is controlled by base MPC functionality SOC option code TEL00012.

2.1.5 OriginalCalledPartyid / RedirectingPartyid Parameter Support (REDIRECTION_FRAMEWORK)

This activity manipulates the redirection history of the call if there is an AIN redirection with the SCP redirection count set as “0”.

If the SCP sends the redirection count as “0”, the call looks as though the AIN redirection is the first redirection of the call. Redirections earlier than the AIN redirection with SCP redirection count as “0” should be ignored. AIN redirection information is not supported for all variants of ISDN BRI. This activity supports the parameters Original Called Number, Redirecting Number, Original Redirecting Reason and Redirecting Reason as applicable to different variants of BRI, for AIN redirections.

This activity also removes the HUNT-LOD AIN interaction limitation in which, after LOD had occurred, encountering the terminating trigger on a LODDN was not supported.

This activity also introduces office parameter REDIRECTION_FRAMEWORK in table OFCVAR. This parameter gives the operating company the option to have the new redirection framework introduced by this activity or the earlier redirection framework.

This activity supports the following redirection services:

- CFW
- KSH
- LOD
- UVM
- SDS
- AIN

2.1.5.1 Applicability

This activity does not change any functionality. However, the redirection information sent to different variants of ISDN agents and for AIN query building does have an impact.

If the redirection_count field in the redirection information parameter is set to "0" by an SCP in a forward call or analyze route message, the redirections earlier to AIN redirection in which the information is reset are not reflected in the redirection information.

2.1.5.2 Limitations

None

2.1.5.3 Optionality

The functionality of the feature OriginalCalledPartyid/RedirectingPartyid Parameter Support is managed via BASE SOC option AIN00310, AIN SE R11 - base.

2.2 What's new in NA019

This section provides an overview of the NA019 content for AIN Service Enablers. Use this content for information purposes only. Nortel Networks reserves the right to change the scope of the work or limits of the software functionality.

NA019 development provided the following activity:

- New Precedence Relationship Between AINDENY Line and AINDENY Customer Group Options

2.2.1 New Precedence Relationship Between AINDENY Line and AINDENY Customer Group Options

The AINDENY line and customer group options allow SFC, PFC and Office-Wide PFC triggers to be denied to either individual DNs or whole customer groups. Starting in NA019, any line option AINDENY "RESTORE TIID <TIID>" entries will override customer group AINDENY "DENY TIID" or "DENY ALL" entries. For example, if trigger "4 OFCPFC1" is

denied to the customer group via a AINDENY tuple in table CUSTSTN, and DN X has AINDENY line option “AINDENY RESTORE TIID 4 OFCPFC1”, the OFCPFC1 trigger will be allowed for that DN.

2.3 What’s new in NA018

This section provides an overview of the NA018 content for AIN Service Enablers. Use this content for information purposes only. Nortel Networks reserves the right to change the scope of the work or limits of the software functionality.

NA018 AIN development provided the following activities:

- DMS-100 AIN Support for the Continue Response to Infocol (Info_Collected) Triggers (S10479223)
- AIN Operator Services Trigger (A59040089)
- CAINTEST Robustness (A59039439)
- AIN Multi Point Code Compliancy on VToA Platform (A59040045)
- AIN Multi Point Code Compliancy on SLoA Platform (A59040055)
- Generic Address List parameter support, Generic Name parameter support, and AIN TFS enhancement for 800P services (GALGNPTFS)
- AIN: Connect To Resource, Send To Resource Enhancements, software optionality control AIN Service Enablers Release 10 (AIN00306)
- AIN CDPCODE trigger versus E800/800P interworking (A59040104)
- AIN Trunk Group Trigger Implementation (S10477755)
- AIN PING RING functionality
- Increasing the AIN MAX SERIAL TRIGGERS limit

AIN Service Enablers for NA018 is based on the following specifications:

- AIN Telcordia specification GR-1298-CORE Issue 7 (GR1298) and GR-1299-CORE Issue 7 (GR1299)

2.3.1 DMS-100 AIN Support for the Continue response to Infocol triggers (S10479223)

This activity allows the DMS-100 North American (CNA18) software load to accept a Continue response to an AIN Info_Collected query. This activity makes the DMS-100 compliant with the AIN Telcordia specification GR-1298-CORE Issue 7, which states that Continue responses should be allowed for Info_Collected queries. The DMS-100 switch can already process Continue responses for other AIN queries.

The accepting of a Continue response to Infocol triggers is controlled via SOC option AIN000210. The AIN subscriber must have one of the allowed AIN

Info_Collected triggers provisioned for the appropriate query to be launched from the DMS-100 switch to the SCP. DMS switch datafill is not required to start or stop the functionality provided by this activity.

2.3.1.1 Limitations

This activity is subject to existing DMS-100 AIN limitations for Continue responses and Info_Collected triggers. These limitations include the following:

- There is a serial triggering limit that prevents too many triggers from being launched on the same call. This activity does not change that limit.
- The DMS-100 does not implement all possible AIN queries at the Info_Collected PIC. This activity does not add any new Info_Collected triggers.
- The DMS-100 creates one or more AMA billing records depending on the presence of an AMAslpID in the Continue response and also depending on the sequence of AIN queries and responses that are hit during a call. This activity does not change the rules for the creation of AMA records, nor does it change the rules for how the AMA record fields are set.
- The DMS-100 allows or disallows the Continue response when it arrives and certain features are active or in progress. These feature interactions are detailed in the AIN Service Implementation Guide. These interactions are not altered by this activity.
- The DMS-100 allows each of the Info_Collected triggers on a subset of possible subscriber types (for example, lines or trunks). This activity does not change those restrictions. Nor does this activity affect how each of the trigger types is datafilled or detected.

2.3.1.2 AMA Billing

The DMS-100 switch outputs no, one, or two AMA records for a series of AIN triggers / responses. If no AIN response contains an AMAslpID parameter and no other billing scenario is in place (SMDR, long distance call, Study records, or ISDN Billing), then no record is output. If the response contains an AMAslpID parameter, the DMS-100 outputs a single merged AMA record by default. If more than one query/response is hit and each response contains a AMAslpID parameter, the DMS merges the AMA records and prints a single record.

In some scenarios, the DMS-100 outputs two AMA records. This activity has not changed the rules regarding DMS-100 AMA record production, but this activity now supports the possibility of multiple Info_collected triggers being hit.

In most cases, the structure code of AIN AMA records is 220 and the call code is 47. However, many datafill options affect these values and there are

scenarios where some other SC or CC takes precedence over the default AIN values.

2.3.1.3 Optionality

The Continue response to Infocol triggers is controlled via SOC option AIN00210. This functionality is enabled by setting the SOC option to ON.

2.3.2 AIN Operator Services Trigger (A59040089)

This activity enables prefix triggers to escape triggering on a specific, applicable pattern. This is done using an escape criteria, which is created by this activity (for the prefix triggers). If the called digits' prefix pattern matches the datafilled digit pattern type, those calls escape triggering.

This activity also enhances the OPERSERV trigger functionality by allowing specific (non-prefix) digit patterns to escape from triggering. If the called digits match the digit patterns in the tuple pointed to by ESCDIG, those calls escape triggering for OPERSERV triggers.

Table AINPRESC is created as part of this activity. This table stores the information about the trigger to be escaped and the prefix digit patterns to be escaped from triggering.

2.3.2.1 Limitations

:The following limitations are associated with this feature:

- DMS doesn't allow for vertical service codes after prefix digits. Vertical service codes cannot be used in table TIESCDIG.
- For calls involving ISUP, PRI trunk originators, or calls involving AIN response translations, zero minus calls are escaped for both 0M and 00M patterns datafilled in table AINPRESC.
- For calls involving ISUP, PRI trunk originators, or calls involving AIN response translations, zero minus calls with a carrier associated with it are escaped for both CAC0M and CAC00M patterns datafilled in table AINPRESC.
- LEC calls are considered as non-carrier calls.

2.3.2.2 Optionality

SOC option AIN00311, 'AIN SE R11 Pfx Pattern', is introduced to control the ESCPRFX and ESCDIG functionality. When SOC AIN00311 is in the IDLE state, criteria checking is not performed.

2.3.3 CAINTEST Robustness (A59039439)

The purpose of this activity is to increase the robustness of the CAINTEST functionality.

:The following improvements have been made to CAINTEST:

- Multi-User functionality is restored.
- Mailbox de-allocation handling is resolved.

2.3.3.1 Limitations

For scenarios in which EDP messaging is to be simulated, the manual method should be used for messaging. The RESPORD command should not be used.

2.3.3.2 Optionality

Not applicable

2.3.4 AIN Multi Point Code Compliancy on VToA Platform (A59040045) and AIN Multi Point Code Compliancy on SLoA Platform (A59040055)

These activities enhance the AIN Enablers functionality to support the AIN application on top of the SS7 Multi Point Code (MPC) platform. This is an umbrella activity addressing the needs of AIN MPC compliancy on Subscriber Lines over ATM (SLoA - now called Universal Access AAL1 i.e., UA-AAL1) and Voice & Telephony over ATM (VToA) platforms.

2.3.4.1 Limitations

None

2.3.4.2 Optionality

There is no specific SOC for this activity. The functionality is controlled by base MPC functionality SOC option code TEL00012.

2.3.5 Generic Address List parameter support, Generic Name parameter support, and AIN TFS enhancement for 800P services (GALGNPTFS)

This activity adds the following NA018 updates and documentation fixes to the AIN Service Enablers product:

- Generic Address List parameter support
- Generic Name parameter support
- AIN TFS enhancement for 800P services

2.3.5.1 Generic Address List parameter support

This activity supports the Generic Address List (GAL) parameter in compliance with requirements documented in GR1298 and GR1299 for the AIN Service Enablers product. The GAL parameter contains up to five Generic Addresses (GA). The GA is defined based on ISDNUP Signaling Generic Address Parameter (GAP). For details of the GAL parameter, refer to document GR-1299-CORE.

The optional parameter GAL is already supported in infoCollected and infoAnalyzed query messages from SSP to SCP. The GAL is also supported in

analyzeRoute (AR) and createCall (CC) responses from SCP to SSP. This activity extends the support of the GAL to the following messages:

- terminationAttempt (TAT) query message from SSP to SCP
- forwardCall Response (FC) message from SCP to SSP

2.3.5.2 Generic Name parameter support

This activity supports the Generic Name (GN) parameter in compliance with requirements documented in GR1298 and GR1299 for the AIN Service Enablers product.The GN parameter was supported for terminationAttempt (TAT), tBusy, tNoAnswer (TNOA) and termResourceAvailable TDP-R query messages from SSP to SCP. However, the GN was not supported for Responses from the SCP to the SSP. This activity supports GN for these Responses. This parameter is based on the ISDNUP GN parameter.

This activity adds support for the GN parameter to the following response messages from SCP to SSP:

- analyzeRoute (AR)
- authorizeTermination (AT)
- forwardCall (FC)
- offerCall (OC)

2.3.5.3 AIN TFS enhancement for 800P services

This sub-activity provides 800P equivalent functionality on AIN using AIN TFS trigger for the Canadian market. Currently, E800 equivalent functionality is already implemented on AIN using AIN TFS trigger for the US market.

2.3.5.4 Limitations

This activity has the following limitations:

For Generic Address List parameter support:

- A maximum of five GenericAddresses are supported in the GAL as per GR1299.
- This activity supports only dialed number, destination number, completion number, supplemental user provided calling address (failed screening), supplemental user provided calling address (not screened), ported number, and proprietary 800 Service Generic Address types.
- If the GAL is received in a response message, it is used first to populate the GAL in query message.
- Only the first GA is populated if there are multiple GAs with the same GA type.
- If SCP sends unsupported/erroneous data for GAL or GN, the parameter is discarded and an error is reported back to SCP.

- This activity only supports AIN capable SCP (GR2892 compliant SCP). It does not support E800 database or 800P database.
- The Feature Type Indicator (FTI) parameter supported by 800P is not supported by this activity.
- The special routing (SR) parameter is added as the AIN extension parameter to provide the southbound functionality required for the 800P support.
- The generic address type supplemental user provided calling address (failed screening) is not a requirement in PRI/BRI. Therefore, current XPM software does not support this generic address. Even though this activity is able to handle the generic address type, the sending of this type of address is not possible in the current environment. In the future, when XPM supports the generic address type, this functionality will automatically be supported.

For AIN TFS enhancement for 800P services:

- The AIN TFS service software depends on the SDS trigger of the AIN. The Tool Deny (TDN) service associated with table IBNXLA overrides the SDS trigger. Hence, the AIN TFS calls originated from a private or Centrex customer group go to treatment if the TDN option exists in table IBNXLA. This is an existing restriction on the AIN TFS. This limitation applies only to TDN as an option to table IBNXLA, not to TDN as a line option to RES and POTS lines. The work around for this AIN TFS limitation can be set up using three methods:
  - — Add the LARP option with the AIN TFS tuple in table TRIGITM
  - — Add appropriate datafill in table XLAMAP and associated translation datafill
  - — Add appropriate datafill in table LATAXLA and associated translation datafill

2.3.5.5 Optionality

This activity is controlled by existing SOC AIN00220. Also, the Generic Name parameter is now controlled under SOC AIN00220.

2.3.6 Connect To Resource, Send To Resource Enhancements

The following message enhancements are provided by this activity:

- Connect To Resource Enhancements
- Send To Resource Enhancements

Connect To Resource Enhancements consist of the following:

- the Destination Address parameter is supported to provide Connect To Resource Intelligent Peripheral functionality
- the DPConverter parameter is supported to provide Dial Pulse (DP) to Dual Tone Multi Frequency (DTMF) Conversion during CTR-IP connection

Send To Resource Enhancements consist of the following:

- two new parameters in STR message PartyId and PartyOnHold are supported

  The PartyID parameter can have three values: Calling, Called, and allParties:

  — Calling - the Resource (Internal Resource/IP) is connected to the Calling Party

  — Called - the Resource is connected to the Called Party

  — allParties - the Resource is connected to all the Parties in a Call

  When the PartyOnHold parameter is present, the other party to which the announcement is played is put on hold.
- Send to Resource in Open Transaction - The AIN Service enablers is enhanced to support STR message from the SCP when there is an open transaction during a stable call (talking state).
- Send To Resource in Query With Permission - The AIN is enhanced to support STR message from the SCP in an Query With Permission (QWP) package during a stable call (talking state). The resource is connected to the agent specified in the CalledPartyId parameter in the STR message. Resource Clear is sent back to the SCP after the end of user Interaction. Disconnect and Continue messages in the Response package are supported after Resource Clear.

2.3.6.1 Application

Connect To Resource and Send To Resource Enhancements enhances the AIN service enablers functionality to support External Resources for CTR message and new functionality for STR.

2.3.6.2 Limitations

PartyId and PartyOnHold is supported only for Timeout, O_Disconnect_Called events and STR in open transaction.

2.3.6.3 Optionality

SOC AIN Service Enablers Release 10 (AIN00306) CTR in CPH (internal) controls Connect to Resource functionality.

2.3.7 AIN CDPCODE trigger versus E800/800P interworking

This activity allows the operating company to choose the precedence between 800 and CDP trigger. This precedence is controlled by using new office parameter AIN_800CDP_PRECEDENCE and the Precedence option AINPRECE against a customer group created by this activity. The precedence between the 800/CDP trigger is determined by two options:

- office-wide option using the office parameter
- customer group option provisioned against a customer group

Note: This activity supports both E800 and 800P services.

When a subscriber from a customer group dials an access_code + 8XX Toll Free number, the precedence between 800 and CDP trigger will be decided by office parameter AIN_800CDP_PRECEDENCE and the Precedence option AINPRECE administered against that customer group.

2.3.7.1 Limitations

None

2.3.7.2 Optionality

The behavior of feature 800/CDP trigger interworking is managed by SOC option AIN00312, 'AIN SE R11 CDP-800'. When SOC option AIN00312 is IDLE, 800 will have precedence over the CDP trigger, irrespective of the office-wide and customer group options.

The new SOC AIN00312 depends on SOC AIN00220.

2.3.8 AIN Trunk Group Trigger Implementation (10477755)

The AIN Trunk Group Trigger (TKTERM) feature is implemented on the Terminating Call Model (TCM) and is an enhancement to the AIN trigger processing functionality.

Without datafilling LARP option for TKTERM trigger, Forward_Call response may not be valid, except in scenarios where valid Primary Trunk Group Id, Alternate Trunk Group Id, Second Alternate Trunk Group Id parameters are received in the FC response and further translations are not required.

2.3.8.1 Limitations

Following are the limitations and restrictions of Trunk Group trigger:

- Population of the following parameters is not supported on the TKTERM query message sent by SSP:
  - CTRConnection
  - AMASequenceNumber
  - Amp1
  - Amp2
  - ExtensionParameter
  - SAP
  - STRConnection
  - RTPSerivceIndicator
- Traver for Authorize_Termination response is not supported.
- Currently, DPT and SIPT trunks are not supported.
- TKTERM trigger is not supported for trunk agents which do not have members in table TRKMEM.
- TKTERM trigger is only supported with the trigitm-model.

2.3.8.2 Optionality

The Trunk Group Trigger functionality is controlled by AIN00310 SOC option. When the AIN00310 SOC option is turned on in the present load, this functionality is available.

When the AIN00310 SOC option is set to IDLE state, the trunk group trigger functionality is turned off.

2.3.9 AIN PING RING functionality

This activity enables the DMS-100 SSP to provide Ping Ring functionality for AIN-based call forwarding calls. Currently, if a call is forwarded by receiving a forward_call response from the SCP, the call forwarding agent is not alerted by any reminder tone. This design provides support for the SSP to give a short ring (approximately 0.5 sec.) called Ping Ring to the forwarding agent involved in an AIN-based call forwarding call.

The Ping Ring functionality is provided for the call forwarding agent only when the SCP sends a forward_call response for a termination_attempt (TAT) trigger, requesting to provide the reminder ring to the call forwarding agent. The call forwarding agent will not receive the reminder ring in any other scenarios.

2.3.9.1 Limitations

Ping Ring is applied only for physical line agents who are idle.

2.3.9.2 Optionality

The Ping Ring functionality is controlled by the AIN service enablers SOC AIN00310.

2.3.10 Increasing the AIN MAX SERIAL TRIGGERS limit

This activity increases the maximum limit for office parameter AIN_MAX_SERIAL_TRIGGERS (in table OFCENG) from 8 to 24.

2.3.10.1 Limitations

Following are the limitations that can be encountered even though the AIN_MAX_SERIAL_TRIGGERS limit is set to a higher value in table OFCENG:

- DMS software resources
- Interaction with call forwarding scenarios
- maximum number of virtual agents
- maximum number of timers

2.3.10.2 Optionality

Not applicable

2.4 What's new in NA017

This section provides an overview of the NA017 content for AIN Service Enablers. Use this content for information purposes only. Nortel Networks reserves the right to change the scope of the work or limits of the software functionality.

NA017 AIN development provided the following activities:

- AIN: Timeout Requested Event (59028609), software optionality control AIN Service Enablers Release 10 (AIN00302)
- AIN: O_Disconnect and O_Disconnect_Called Events (59028631), software optionality control AIN Service Enablers Release 10 (AIN00301)
- Geodetic Location Parameter in AIN Triggers (59036223), and Generic Digits List Parameter in AIN Trigger (59036234), software optionality control AIN Service Enablers Release 10 (AIN00305)
- AIN Timeout Phase II (59037100), software optionality control AIN Service Enablers Release 10 (AIN00302), and AIN O_Disconnect Phase II (59037082) software optionality control AIN Service Enablers Release 10 (AIN00301)

- AIN Resource Layer Re-Engineering (59037110), software optionality control AIN Service Enablers Release 10 (AIN00307)
- Office Public Feature Code Trigger Implementation (59037120), software optionality control AIN Service Enablers Release 10 (AIN00309)
- Advanced Intelligent Network Scope Change Tool (59037130), software optionality control AIN Service Enablers Release 10 (AIN00308)
- AIN: Connect To Resource, Send To Resource Enhancements, software optionality control AIN Service Enablers Release 10 (AIN00306)

AIN Service Enablers for NA017 is based on the following specifications:

- GR-1129-CORE, *AINGR: Switch—Intelligent Peripheral Interface (IPI)*, Issue 2, Bellcore
- GR-1298-CORE, *AINGR: Switching Systems*, Issue 6, Bellcore
- GR-1299-CORE, *AINGR: Switch—Service Control Point (SCP)/Adjunct Interface*, Issue 6, Bellcore
- GR-3017-CORE, *Generic Requirements for an AIN-Based Implementation of E9-1-1 Service, Issue 2, Bellcore*

2.4.1 AIN: Timeout Requested Event (59028609)

When speech path is established for the call segment in which the Timeout call party handling event is armed, the Timeout timer is started. The Timeout EDP-Request is sent to the SCP when the timer expires. The message returned by the SCP (only Disconnect supported by this activity) is processed. The Disconnect response processing provides AIN Disconnect (AIND) treatment to the controller and the call leg is taken down.

The Timeout functionality consists of the following:

- Arming the Timeout event
- Timeout event detection and processing
- Timeout EDP-R query message processing
- Response processing
  - Disconnect message processing
  - Continue message processing
- Post-Query message handling and Error handling

2.4.1.1 Application

This activity implements the functionality for the DMS SSP to detect the Timeout call party handling event as an EDP-Request and process the response provided by the SCP.

2.4.1.2 Limitations

This feature does not support the following:

- Calls involving more than three agents
- The following messages that can arm the Timeout event:
  - Originate_Call
  - Split_Leg
  - Move_Leg
  - Merge_Call
  - Reconnect
  - Disconnect_Leg
  - Acknowledge
- Population of the following parameters on the Timeout Requested Event query message sent by the SSP:
  - Amp 1
  - Amp 2
  - ExtensionParameter

2.4.1.3 Optionality

SOC AIN Service Enablers Release 10 - Timeout Event (AIN00302) controls AIN: Timeout Requested Event functionality.

2.4.2 AIN: O_Disconnect and O_Disconnect_Called Events (59028631)

When an O_Disconnect event is armed and the Originator / Controlling party disconnects after the call has been answered by the called party, an O_Disconnect event is detected and an O_Disconnect EDP-R message is sent to the SCP.

When an O_Disconnect_Called event is armed and the Terminator / Called party disconnects, an O_Disconnect_Called event is detected and an O_Disconnect EDP-R message is sent to the SCP.

The O_Disconnect and O_Disconnect_Called events functionality consists of the following:

- Arming O_Disconnect or O_ Disconnect_Called or both events
- O_Disconnect or O_ Disconnect_Called event detection and processing
- O_Disconnect EDP-R query message processing
- Response processing
- Post-Query message handling and Error handling

2.4.2.1 Application

O_Disconnect and O_Disconnect_Called Event enhances the AIN Service Enablers functionality to support the detection of O_Disconnect (Calling) and O_Disconnect_Called event.

2.4.2.2 Limitations

This feature does not support the following:

- Calls involving more than three agents
- Call hold and call transfer features
- The following messages:
  - Disconnect_Leg
  - Merge_Call
  - Reconnect
- The following messages that can arm the O_Disconnect event:
  - Merge_Call
  - Reconnect
  - Disconnect_Leg
- Population of the following parameters on the O_Disconnect Event query message sent by the SSP:
  - Amp 1
  - Amp 2
  - ExtensionParameter

2.4.2.3 Optionality

SOC AIN Service Enablers Release 10 - (AIN00301) O_Disconnect Events controls O_Disconnect and O_Disconnect_Called Requested Events functionality.

2.4.3 Geodetic Location Parameter in AIN Triggers (59036223) and Generic Digits List Parameter in AIN Trigger (59036234)

Activity 59036223 enhances the AIN Service Enablers functionality to support the Generic Digits List Parameter and the Calling Geodetic Location Parameter (CGLP) in the TAT query messages.

Activity 59036234 enhances the AIN Service Enablers functionality to support the Generic Digits List Parameter (GDLP) and the Calling Geodetic Location Parameter in the Info_Analyzed query messages.

2.4.3.1 Application

Enhancements to the existing E911 services for wireless calls provide location information in the form of longitude and latitude. This information is used by the wireless switch to route the wireless call to the appropriate PSAP.

2.4.3.2 Limitations

Under the following conditions, the Calling Geodetic Location (CGL) and the Generic Digits List (GDL) are not sent out in the TDP-R query:

- wire line emergency calls
- Info_Collected messages
- any triggers based on specific trunk type
- the parameters are not received in the incoming IAM message for ISUP
- the call was set up with signaling other than SS7, (for example, ISDN Call Setup message or PTS), and therefore, parameters are not received in the incoming signaling
- for location-based services (if non-emergency call), when the CGL and the GDL parameters are not received in the incoming IAM message

2.4.3.3 Optionality

Software optionality control AIN Service Enablers Release 10 - Geo Loc Parm (AIN00305) controls Geodetic Location Parameters.

2.4.4 AIN Timeout Phase II (59037100), and AIN O_Disconnect Phase II (59037082)

Activities 59037100 and 59037082 enhance the Timeout (59028609) and O_Disconnect (59028631) features based on enhancements in GR1298 Issue-6. Activities 59037100 and 59037082 support new timeout timer parameters and new messages for Timeout EDP-R.

2.4.4.1 Application

Activities 59037100 and 59037082 are an enhancement of Timeout (59028609) and O_Disconnect and O_Disconnect_Called (59028631) features.

2.4.4.2 Limitations

Activities 59037100 and 59037082 have the following limitations:

- The switch-based feature controller and the AIN controller cannot be the same agent unless the switch-based feature is CWT or one of its varieties (CWI, CWC, CWO, TCW, CWD).
- When CHD is present on a terminator that has CWT, the CPH event armed will be closed if the call lands on a busy agent which has CWT and CHD.

- The following messages are not supported:
  - — Originate_Call
  - — Split_Leg
  - — Move_Leg
  - — Merge_Call
  - — Reconnect
  - — Disconnect_Leg
  - — Acknowledge
- Population of the following parameters on the O_Disconnect Event query message sent by the SSP
  - — Amp 1
  - — Amp 2
  - — ExtensionParameter

2.4.4.3 Optionality

Software optionality control AIN Service Enablers Release 10 - Timeout Event (AIN00302) controls AIN: Timeout Requested Event functionality.

Software optionality control AIN Service Enablers Release 10 - (AIN00301) O_Disconnect Events controls O_Disconnect and O_Disconnect_Called Requested Events functionality.

2.4.5 AIN Resource Layer Re-Engineering (59037110)

Visibility under this activity can be classified into the following functional components:

- Memory Capacity Enhancement for AIN Resource Layer
- SOC Support

2.4.5.1 Application

Activity 59037110 enhances the AIN Resource Layer Capacity to support a 500,000-line DMS system.

2.4.5.2 Limitations

The following limitation applies:

- The capacity increase applies only for TRIGITM interface, not the TRIGGRP interface. To take advantage of the new higher limits, TRIGGRP to TRIGITM conversion must be done.

2.4.5.3 Optionality

Software optionality control AIN Service Enablers Release 10 - AIN00307 Trig Cap Incr controls AIN Resource Layer Re-Engineering functionality.

2.4.6 Office Public Feature Code Trigger Implementation (59037120)

The AIN Office Public Feature Code (OFCPFC) Trigger feature is implemented on the Originating Call Model (OCM) and is an enhancement to the AIN trigger processing functionality.

2.4.6.1 Application

Trigger OFCPFC is detected if the dialed digits match the vertical service code defined for that trigger item. When the trigger is detected, a query is launched to the SCP requesting additional instructions for processing the call. Based on the valid response received from the SCP, the call is processed further.

Option AINDENY is enhanced to store 15 entries instead of four as it was in NA015.

The AINDENY line options scope is extended to customer group. In table CUSTSTN, AINDENY option can be assigned to customer group.

2.4.6.2 Limitations

The following limitations apply:

- Though the Office_Public_Feature_Code trigger is an office-wide trigger, only RES and ISDN BRI agents encounter the trigger. While provisioning trigger OFCPFC on an office, all the agents within that office will be subscribed without any warning or errors. Checking for an agent will be done only during run time (CallP) and only RES and ISDN BRI agents will trigger.
- The OFCPFC trigger that is subscribed on an office will not support a Continue response. If a continue response is received, the call will be routed to AINF treatment.
- The AINDENY option, when used to deny triggers on a line, will deny a maximum of 15 trigger item IDs.

2.4.6.3 Optionality

Software optionality control AIN Service Enablers Release 10 - (AIN00309) Trigger Office_Public_Feature_Code controls office public feature code Trigger Implementation functionality.

2.4.7 Advanced Intelligent Network Scope Change Tool (59037130)

The functionality of AIN Scope Change Tool (AINSCT) is to:

- convert the existing line-based subscription of the PFC/SFC trigger in the TRIGITM data model to a customer-group-based subscription in the TRIGITM data model
- convert the existing line-based subscription of the PFC/SFC trigger in the TRIGGRP data model to a customer-group-based subscription in the TRIGITM data model

2.4.7.1 Application

Activity 59037130 implements AIN Scope Change Tool (AINSCT).

2.4.7.2 Limitations

The following limitations apply:

- A Convert sub-command will not add AINDENY and will print a warning message conveying the same if all of the conditions listed below are satisfied:
  - — An agent belongs to that customer group.
  - — The agent has no individual subscription to the PFC/SFC trigger entered by the craftsperson.
  - — The agent has maximum number of AINDENYs subscribed on it.
- The AINSCT tool will not have a provision to undo the changes incurred due to use of this tool. Any changes required must be done manually.
- If the AINGRP entered in the CONVERT sub-command is associated with tho PFC/SFC and CDPCODE triggers, then only the PFC/SFC trigger is added to the RES GROUP. The CDPCODE trigger is not provisioned to the RES GROUP because CDPCODE trigger is incompatible with the RES group.

2.4.7.3 Optionality

Software optionality control AIN Service Enablers Release 10 - (AIN00308) Scope Change Tool controls Advanced Intelligent Network Scope Change Tool functionality.

2.4.8 AIN: Connect To Resource (59037140)

The Connect_To_Resource message is an SCP/Adjunct message sent to an SSP in response to a midcall trigger or event. If the Connect_To_Resource is received as a response to an event detected in the Origination Basic Call Model (OBCM), then for a call in CC2 (CC2 is a Stable 2-Party call) the Connect_To_Resource is valid only at the O_Mid_Call DP or after PIC 9 (O_Active) has been reached. If Connect_To_Resource is received as a response to an event armed in Terminating Basic Call Model (TBCM), then for

a call in CC2, Connect_To_Resource is valid only at the T_Mid_Call DP or after PIC 16 (T_Active) has been reached.

2.4.8.1 Application

Activity 59037140 implements the functionality for the Service Switching Point (DMS-100 SSP) to process the Connect_To_Resource (CTR) message. The Connect_To_Resource message is returned in response to a midcall trigger or event to connect a user (in talking state) to a resource.

2.4.8.2 Limitations

The following limitations apply:

- Connect_To_Resource message processing is supported only for Internal Resource.
- Connect_To_Resource messages are received in response only for Timeout, O_Disconnect, and O_DisconnectCalled queries.
- Connect_To_Resource is not supported for external resources such as IP.
- For O_Disconnect Event, CTR is supported only in Response Package.

2.4.8.3 Optionality

SOC AIN Service Enablers Release 10 - (AIN00306) CTR in CPH (internal) controls Connect to Resource functionality.

2.5 What's new in NA016

This section provides an overview of the NA016 content for AIN Service Enablers. Use this content for information purposes only. Nortel Networks reserves the right to change the scope of the work or limits of the software functionality.

NA016 AIN development provided the following activities:

- STR-Connection Timer (59028621), software optionality control AIN Service Enablers Release 10 (AIN00303)
- Carrier Support for Send To Resource (59028643), and Send To Resource (STR) Response Translations Modifications (59031410), software optionality control AIN Service Enablers Release 10 (AIN00304)
- E911: Log and ISUP Enhancements (59029627)

AIN Service Enablers for NA016 is based on the following specifications:

- GR-1129-CORE, *AINGR: Switch—Intelligent Peripheral Interface (IPI)*, Issue 2, Bellcore
- GR-1298-CORE, *AINGR: Switching Systems*, Issue 5, Bellcore
- GR-1299-CORE, *AINGR: Switch—Service Control Point (SCP)/Adjunct Interface*, Issue 5, Bellcore

2.5.1 STR-Connection Timer (59028621)

The maximum duration of an IP connection is determined by the value AIN_TSTRC_TIMER in table OFCENG and the default value of the AIN_TSTRC_TIMER is 6 minutes. The supported range of the AIN_TSTRC_TIMER is 0 to 60 minutes with one-minute increments.

2.5.1.1 Application

The maximum duration of connectivity to the IP is determined by the TSTRCTimer parameter in the STR message.

2.5.1.2 Limitations

The following limitations apply:

- When the TSTRCTimer parameter received in the STR message has a value between 61 minutes and 300 minutes, the timer value is set to 60 minutes.
- When two timers are running (one at local and another at remote), the first timer to expire will release the connection to the IP and send a ResourceClear with ClearCause ‘ipTimeout.’ One example of this condition is when the Remote SSP is running NA015 or earlier loads. In this case, there is no way to find the cause of the timer expiry in the Remote SSP.
- When the TSTRC timer is not started at the local SSP, the timer is not started at the remote SSP even if the SOC AIN00303 state is ‘ON’ at the remote SSP. This condition results in there being no timer control for the IP connection.

2.5.1.3 Optionality

SOC AIN Service Enablers Release 10 - STR-Connection Timer (AIN00303) controls STR-Connection Timer functionality.

2.5.2 Carrier Support for Send To Resource (59028643), and Send To Resource (STR) Response Translations Modifications (59031410)

Activity 59028643 introduces Equal Access support for Send_To_Resource-IP interaction, and support for Carrier, Alternate Carrier, and Second Alternate Carrier in the Send_To_Resource message on the SSP.

Activity 59031410 implements a new translation pattern for processing the Destination Address.

2.5.2.1 Application

Carrier parameters are used to set up calls to an Intelligent Peripheral that may be located in a different LATA. The Destination Address in the STR message is used to route to the IP.

2.5.2.2 Limitations

None

2.5.2.3 Optionality

SOC AIN Service Enablers Release 10 — (AIN00304) Carrier STOR & STR Translations, controls Carrier Support for Send To Resource, and Send To Resource (STR) Response Translations Modifications functionality.

2.5.3 E911: Log and ISUP Enhancements (59029627)

Although this is not an AIN activity, it includes AIN Enhancements that affect the following two areas:

- ESN retrieval from the ChargeNumber
- modifications to the E911229 log

2.6 What's new in NA015

This section provides an overview of the NA015 content for AIN Service Enablers. Use this content for information purposes only. Nortel Networks reserves the right to change the scope of the work or limits of the software functionality.

NA015 AIN development provided the following activities:

- DP Converter for STR/IP and Collect Info (59022523), software optionality control AIN Service Enablers Release 9 (AIN00292)
- Extended Ringing to External IP (59022498), software optionality control AIN Service Enablers Release 9 (AIN00291)
- PFC Office Administration (59022533), software optionality control AIN Service Enablers Release 9 (AIN00294)
- Enhancement to Line Attribute Response Processing (59022554 and 59022754), software optionality control AIN Service Enablers Release 9 (AIN00293)

AIN Service Enablers for NA015 is based on the following specifications:

- GR-1129-CORE, *AINGR: Switch—Intelligent Peripheral Interface (IPI)*, Issue 2, Bellcore
- GR-1298-CORE, *AINGR: Switching Systems*, Issue 5, Bellcore
- GR-1299-CORE, *AINGR: Switch—Service Control Point (SCP)/Adjunct Interface*, Issue 5, Bellcore

2.6.1 DP Converter for STR/IP and Collect Info (59022523)

The DP Converter for STR/IP and Collect Info feature provides dial pulse (DP) to dual-tone multifrequency (DTMF) conversion upon receiving the DPConverter parameter set to TRUE in the Send_To_Resource/Collect Info

message. This feature provides for sending both the dialed DP digits and the equivalent DTMF tones to the terminator / intelligent peripheral (IP) and terminating agent.

DP-to-DTMF conversion can be used for the following scenarios:

- The terminating access is an intelligent peripheral that can process only DTMF tones and provides a menu-driven service that uses DTMF tones provided from the originator. Examples of such services are telephone banking and ticket reservations.
- The originating line has dial pulse customer premise equipment.

2.6.1.1 Application

This feature allows dial pulse customer premise equipment to use the menu-driven services of an intelligent peripheral.

2.6.1.2 Limitations

This feature does not support the following:

- ISDN or KSET line agents
- The DPConverter parameter, when received in the Update, Connect_To_Resource, and Originate_Call Messages

2.6.1.3 Optionality

Software optionality control AIN Service Enablers Release 9 - DP Converter (AIN00292) controls DP Converter for STR-IP and Collect Info functionality.

2.6.2 Extended Ringing to External IP (59022498)

The service switching point (SSP) processing of the Send_To_Resource message was expanded to provide extended ringing functionality for the O_No_Answer trigger and event by ACTID 59006320 in NA012. However, this feature was limited to internal support and did not support connections to a local or remote intelligent peripheral (IP). The T_No_Answer trigger and event were not supported by that feature.

The Extended Ringing to External IP feature extends this capability to support an intelligent peripheral. Also, this feature enhances the extended ringing capability by providing support for T_NoA triggers and events for resources that are either local or remote to the SSP. When the destinationAddress parameter is in the STR message, the announcement or digit collection uses external resources. The absence of the destinationAddress parameter in the STR message implies that the system processes the STR request using resources internal to the SSP.

After receiving an O_No_Answer query or T_No_Answer query from the service switching point for a given call, the service control point/adjunct returns a Send_To_Resource (STR) message. As a response message, STR

plays an announcement to the originator. As a conversation package, STR plays an announcement and collects digits.

2.6.2.1 Application

Extended ringing functionality allows a service provider to continue to offer the call to the called party while playing an announcement to and collecting digits from the originator. When the called party answers, the announcement stops and the calling party is connected to the called party.

2.6.2.2 Limitations

The following limitations apply:

- The system supports no triggers or events other than O_No_Answer and T_No_Answer.
- The system does not support extended ringing capability when interacting with conferencing features such as 3WC.
- For O_No_Answer, all call forwarding completes before the STR message with the ExtendedRinging parameter processes.
- For call forwarding with T_No_Answer, the system processes the timer that expires first (T_NoA or CFDA) and cleans up the other feature.

2.6.2.3 Optionality

Software optionality control AIN Service Enablers Release 9 - Extended Ringing to External IP (AIN00291) controls extended ringing to external IP functionality.

2.6.3 PFC Office Administration (59022533)

The SFC and PFC Customer group subscription features allow for assigning public feature code (PFC) and specific feature code (SFC) trigger items to customer groups. Individually subscribed triggers take precedence over group-based subscribed triggers. Only RES and ISDN BRI agents are allowed to trigger on PFC and SFC triggers that are subscribed at the customer group level. This functionality is only implemented in the trigger item provisioning interface.

Line option AINDENY is introduced by this activity. This line option allows calls on individual lines to be excluded from triggering when the PFC and SFC triggers are subscribed on the customer group.

Line option AINDENY provides a way of excluding individual lines from triggering for:

- particular trigger item IDs of PFC or SFC trigger types
- all group-subscribed trigger items of PFC or SFC trigger types

2.6.3.1 Application

This activity supports the per line exclusion of PFC and SFC services within a customer group.

2.6.3.2 Limitations

The following limitations apply:

- The SFC and PFC Customer Group Subscription features only support RES and ISDN BRI lines. While provisioning on a customer group, all the agents within that customer group will be subscribed without any warning or errors. The checking for an agent will only be done during run time (CallP), and only RES and ISDN BRI agents will trigger.
- The SFC and PFC triggers that are subscribed on a customer group will not support a Continue response. If a Continue response is received, the call will route to AIN treatment.
- Option AINDENY can only be provisioned for 64k lines.

2.6.3.3 Optionality

Software optionality control AIN Service Enablers Release 9 - PFC Trig Admin (AIN00294) controls the PFC/SFC Customer Group Subscription feature and option AINDENY.

Note: AIN00294 also controls the LARP feature that follows.

2.6.4 Line Attribute Response Processing (59022554 and 59022754)

Line Attribute Response Processing (LARP) was enhanced to support N11 and PFC triggers apart from the already existing SDS LARP support. The trigger item provisioning interface implements trigger-specific line attributes by datafilling the option LARP on an SDS/N11/PFC trigger item.

The LARP enhancement addresses the need to allow the response from the SCP to a specific PFC and N11 trigger to bypass the originator's line screening by provisioning LARP. This allows the customer to overcome the toll restrictions imposed by the originator's line attribute.

To provision overriding line attributes for a trigger item, option LARP must be datafilled in table TRIGITM. Option LARP is assigned on a per-trigger basis to SDS. PFC and N11 triggers are defined in table TRIGITM. When this option is present, the line attributes information datafilled in the option override the originator's line attributes.

Operating companies have the flexibility to let the response processing on a trigger having overriding line attributes to be treated as a redirection or no-redirection. This is achieved by introducing field REDIR in table TRIGITM under option LARP. The operating company can override the redirecting parameters (redirecting party ID and redirecting reason) and charge

number, normally derived by the SSP in the absence of redirecting parameter and charge number, in the SCP analyze_route message. These values can be datafilled as part of the forwarding attributes, which is optional under option LARP in table TRIGITM.

The redirection and forwarding attributes are only applicable to option LARP table TRIGITM.

2.6.4.1 Application

Line Attribute Response Processing feature allows LARP support for PFC and N11 triggers along with the already existing SDS LARP support. TRAVER support is also enhanced to simulate LARP for AIN Response Translations for SDS/N11/PFC triggers.

2.6.4.2 Limitations

The following limitation applies:

- forwarding attributes. TRAVER support is only for the LARP simulation.

2.6.4.3 Optionality

Software optionality control AIN Service Enablers Release 9 - Line Attribute Response Processing (59022554 and 59022754) enhanced to support PFC and N11 triggers.

2.7 What's new in NA014

This section provides an overview of the NA014 content for AIN Service Enablers. Use this content for information purposes only. Nortel Networks reserves the right to change the scope of the work or limits of the software functionality.

NA014 AIN development provided the following activities:

- AIN CarrierUsage Parameter Processing (59016521), software optionality control AIN Service Enablers Release 8 (AIN0282)
- Term Resource Available Trigger Processing (59016005), software optionality control AIN Service Enablers Release 8 (AIN00281)

AIN Service Enablers for NA014 is based on the following specifications:

- GR-1298-CORE, *AINGR: Switching Systems*, Issue 5, Bellcore
- GR-1299-CORE, *AINGR: Switch—Service Control Point (SCP)/Adjunct Interface*, Issue 5, Bellcore
- GR-1129-CORE, *AINGR: Switch—Intelligent Peripheral Interface (IPI)*, Issue 2, Bellcore
- GR-2892-CORE, *Switching and Signaling Generic Requirements for Toll-Free Service using Advanced Intelligent Network*, Issue 1, Bellcore

2.7.1 CarrierUsage Parameter Processing (59016521)

This activity introduces parameter CarrierUsage in the SCP message. The parameter allows the SSP to process carriers received in an SCP message as preferred carriers rather than forced carriers. Examples of SCP messages are Analyze_Route, Forward_Call, and Create_Call.

The value of parameter CarrierUsage and the call type decides what carrier routes the call. The call type of a call is determined by the translators after translating the digits in the CalledPartyID during response translations. The translators use datafill in table LATAXLA. CarrierUsage functionality does not look ahead to find the call type of the call.

Possible values for parameter CarrierUsage are:

- AlwaysOverride. This value forces the SSP to use the carrier(s) sent by the SCP to route the call.
- InterlataOverride. When the call type is Interlata, this value informs the SSP to use the carrier sent by the SCP to route the call. When the call type is not Interlata, the SSP ignores the carrier sent by the SCP and uses the carrier information in the SSP to route the call.
- OverridePICsOfNOCsSent. When the SCP sends CarrierUsage value ‘OverridePICsOfNOCsSent’, the SSP selects a valid carrier from the list of carriers sent by the SCP. A valid carrier is a carrier that can carry the type of traffic mentioned in parameter NatureOfCarrier. When the NatureOfCarrier of a valid carrier matches the call type, the SSP uses that carrier to route the call. When no carrier has a NatureOfCarrier that matches the call type, the SSP uses carrier information from the SSP to route the call.

2.7.1.1 Application

Parameter CarrierUsage allows the SSP to process carriers received in an SCP message as preferred carriers rather than forced carriers.

2.7.1.2 Limitations

This activity does not support routing of equal access over private trunks after receiving a message containing parameter CarrierUsage.

2.7.1.3 Optionality

Software optionality control AIN Service Enablers Release 8 CarrierUsage - (AIN00282) controls CarrierUsage Parameter Processing functionality.

2.7.2 Term Resource Available Trigger Processing (59016005)

This activity applies to the AIN Terminating Call Model (TCM). The activity enhances AIN Trigger Detection Point (TDP) processing.

At the exit of the Select Facility PIC, the SSP can hit the terminating resource available (TRA) trigger when the terminating resource is not busy.

Operating company personnel datafill the SSP to hit this trigger. Each terminating agent has its own datafill. When the call hits this trigger, a query goes to the SCP and requests further instructions on how to process the call. The SSP intercepts the audible ring indication that is sent to the originating call half and sends a TRA trigger query to the SCP. At the same time, the SSP blocks power ringing to the terminating agent.

Based on the valid response received from the SCP, the call either terminates on the called DN or forwards to another DN.

When the call does not hit this trigger, call processing continues to the next point in call (PIC).

2.7.2.1 Application

The activity enhances AIN Trigger Detection Point (TDP) processing.

2.7.2.2 Limitations

This feature does not support:

- subscription and triggering based on the call type
- trunk subscription to TRA
- TRA for Attendant Console for subscription and encountering
- virtual DNs for subscription of trigger TRA
- manual line for subscription and encountering of trigger TRA
- AIN virtual directory number (VDN) for subscription and encountering of trigger TRA
- on the TRA query message sent by SSP, population of the parameters that follow:
  - CTRConnection
  - AMASequenceNumber
  - Amp1
  - Amp2
  - ExtensionParameter
  - SAP
  - STRConnection
- default routing. When the response from the SCP is not received by the SSP, call processing continues by alerting the terminator.

2.7.2.3 Optionality

Software optionality control AIN Service Enablers Release 8 - Term Resource (AIN00281) controls Term Resource Available Trigger processing functionality.

2.8 What's new in NA013

This section provides an overview of the NA013 content for AIN Service Enablers. Use this content for information purposes only. Nortel Networks reserves the right to change the scope of the work or limits of the software functionality.

NA013 AIN development provided the following activities:

- Create_Call (59011907),

  SOC option code AIN Service Enablers Release 7 - (AIN00271)

- multiple extended TCAP transactions (METT) in OCM (59013226),

  SOC option code AIN Service Enablers Release 7 - (AIN00272)

- AIN-dynamically controlled routing (DCR) interworking (59013169),

  SOC option code AIN00060

- AIN network tools support for NA013 (59013251)

Note: Feature Off-Hook Delay (OHD) Trigger on PX Trunks uses software optionality control AIN00061. The DMS-100 product does not support this feature.

AIN Service Enablers for NA013 is based on the following specifications:

- GR-1298-CORE, *AINGR: Switching Systems*, Issue 4, Revision 1, Bellcore, October 1998
- GR-1299-CORE, *AINGR: Switch—Service Control Point (SCP)/Adjunct Interface*, Issue 4, Revision 1, Bellcore, October 1998
- GR-1129-CORE, *AINGR: Switch—Intelligent Peripheral Interface (IPI)*, Issue 2, Bellcore, July 1996
- GR-2892-CORE, *Switching and Signaling Generic Requirements for Toll-Free Service using Advanced Intelligent Network*, Issue 1, Bellcore, April 1995

2.8.1 Create_Call (59011907)

This activity allows the SCP to request that the SSP create a connection between a calling party and a called party. The Create_Call message is an SCP event message. The SSP has no knowledge of this request.

The Create_Call message comes in a query package from the SCP, and can have one or more of the following messages:

- request report BCM event (RRBCME)

  Note: See Chapter 20: “Limitations” on page 663.

- send notification
- automatic code gapping (ACG)

Parameters CallingPartyID and CalledPartyID must be present in the Create_Call message. The originator identified by the CallingPartyID must reside on the SSP that receives the Create_Call message. The terminator of the call can be within the same SSP or can be outside of the SSP.

The switch uses AIN response translations to set up the call between the calling party and the called parties.

2.8.1.1 Application

This feature allows the SCP to create a call based on SSP service logic. The calling party can hit triggers starting at trigger detection point (TDP) 4 and up. When the Create_Call message sets up the call, the originator ignores TDPs 1 and 3.

2.8.1.2 Limitations

The following limitations apply to this activity:

- The RRBCME message is not processed when it comes with the Create_Call message.
- This feature does not support originators that are ISDN BRI, attendant console, coin lines, data units, party lines, ACD, UCD, and DISA.

- Analog display service interface (ADSI) phones are treated like analog phones. This feature does not support enhancements to ADSI signaling support agents.
- This activity does not support the following optional parameters in a Create_Call message:
  - ServiceProviderID
  - ServiceContext
  - CarrierUsage
  - VerticalServiceCode
  - AccessCode
  - DisplayText
  - WakeUpDuration
  - OSIIndicator
  - AMAServiceproviderID
  - Amp1
  - Amp2
  - ExtensionParameter
  - GenericDigitsList

When the SSP receives one of the previously listed unsupported parameters, the SSP discards the parameter and call processing continues.

2.8.1.3 Optionality

Software optionality code AIN Service Enablers Release 7 - Create_Call (AIN00271) provides optionality for Create_Call functionality.

2.8.2 Multiple extended TCAP transactions in OCM (59013226)

This activity provides SSP support for multiple extended TCAP transactions (METT) in the originating call half. This feature does not support METT in the terminating call half. Multiple transactions, related to the same originating call half, can remain open at the same time. Events related to different transactions can remain armed simultaneously.

METT in OCM works with the following events:

- O_Called_Party_Busy
- O_Answer
- Network_Busy
- O_No_Answer

METT functionality does not change the way that switched-based features work with NELs. For more information, see the "Originating call model events" chapter of the *Advanced Intelligent Network Service Enablers: Service Implementation Guide*.

2.8.2.1 Application

This activity allows the SCP to arm multiple events in the same originating call half.

2.8.2.2 Limitations

This functionality is impacted by the following existing limitations:

- The parameter AIN_MAX_SERIAL_TRIGGERS in table OFCENG limits the number of EDP-Rs & TDP-Rs that can be sent in a call half. This parameter has a default value of 6 and a maximum value of 8.
- The SSP can simultaneously attach eight timer resources to a call. The number of O_NoA and T_NoA events or triggers and switch-based features using timers, combined, can use eight timer resources at any given instant in a call. Examples of switch-based features using timers are CFDA, ISA, and NoA.
- Any O_No_Answer timer that expires while the SSP is waiting for a response to an O_No_Answer EDP-R or TDP-R, must wait until the SCP receives and processes the previous O_No_Answer response.
- The limitations of OCM NELs apply to this activity.

2.8.2.3 Optionality

SOC option code AIN Service Enablers Release 7 - METT in OCM (AIN00272) controls METT in OCM functionality.

2.8.3 AIN DCR interworking (59013169)

This activity gives operating companies more flexibility when routing DCR calls that encounter AIN.

Note: This feature applies to the Canadian market only.

When an AIN response causes a retranslation or a redirection that results in a new route, the routing history before the AIN query does not limit the use of tandem routes. This activity supports DCR selectors DCRT and NODE during AIN response processing.

Overflow traffic, separated by one or two links, can dynamically route from an originating switch. Each switch of the DCR network provides traffic congestion data to a network processor (NP) describing the resource use of the switch. The NP uses this data to calculate alternate routing recommendations for calls that overflow their direct route. The NP then provides the switches with these recommendations.

DCR applies an attribute to the call to block tandem calls that are two or more links away from the destination at the tandem office or the destination office. This attribute is called DCR handicap. When a call retranslates or redirects (for example, as a result of AIN), the tandem office removes the DCR handicap. Removal of the handicap can increase the completion rate of AIN calls.

2.8.3.1 Application

This activity gives telephone operating companies added flexibility in routing DCR calls that encounter AIN.

2.8.3.2 Limitations

For DCR tandem calls (calls incoming on a DCR trunk), exception routes are used when Second Leg Exception Routing (SLER) is ON. When SLER is OFF, routing does not use exception routes. The AFR trigger, when datafilled in the exception route list, is not encountered.

2.8.3.3 Optionality

Software optionality code (SOC) AIN00060, AIN DCR interworking, tracks this feature.

Note: This SOC is part of the Advanced Intelligent Network Essentials product.

2.8.4 AIN network tools support for NA013 (59013251)

This activity

- allows the AINTrace tool to select messages by operation code as well as by agent
- provides an MSG syntax for AINTrace options SELECT and REMOVE

This activity allows AINTrace to trace:

- Create_Call messages
- the following subset of non call-related (NCR) messages:
  - — ACG
  - — Monitor_For_Change
  - — Update

    Note: When users select Update, AINTrace provides information on Update, Update_Data, Update_Request, and Update_Success.

  - — Update_Data
  - — Update_Request
  - — Update_Success

2.8.4.1 Application

AINTrace allows the operating company to check AIN messages and parameters that the DMS-100 SSP supports.

2.8.4.2 Limitations

The following limitations apply to this activity:

- When users use the AINTrace tool to trace ACG messages, unless the affected TID is traced as well, an ACG message received in a multi-component message is not traced nor displayed. When the user selects ACG, the AINTrace tool traces ACG messages only.
- AINTrace is a single user tool.

2.8.4.3 Optionality

SOC option code AIN Service Enablers Release 7 - AIN Nettools support for NA013 (AIN00270) provides enhancements to AIN network tools.

2.9 What's new in NA012

The information in this section provides an initial view of the NA012 content for AIN Service Enablers. The content in this section should be used for information purposes only. Nortel Networks reserves the right to change the scope of the work or any limitations that are associated with the software.

NA012 AIN Service Enablers development provided the following capabilities:

- line attribute response processing (provisioning) (59008267)

  SOC option code AIN Service Enablers Release 6 Base - (AIN00260)
- redirection interworking with events and trigger O_BNA (59010421)

  SOC option code AIN Service Enablers Release 6 Base - (AIN00260)
- increase virtual ports (59006039)

  SOC option code AIN Service Enablers Release 6 Base - (AIN00260)
- DFIL logs-report datafill error in RTECHAR (SR10206878)

  SOC option code AIN Service Enablers Release 6 Base - (AIN00260)
- CAC dialing for equal access (SR10216514)

  SOC option code AIN Service Enablers Release 6 Base - (AIN00260)
- AIN network tools upgrade (SR10202203)

  SOC option code AIN Service Enablers Release 6 Base - (AIN00260)
- DisplayText for MADN/EBS [Auth_Term, Offer_Call] (SR10206792)

  SOC option code AIN Service Enablers Release 6 AIN DisplayText - (AIN00261)

- DisplayText for BRI [Auth_Term, Offer_Call] (59006414)

  SOC option code AIN Service Enablers Release 6, AIN DisplayText - (AIN00261)

- Monitor_For_Change for hunt groups (59006290)

  SOC option code AIN Service Enablers Release 6, Monitor for Change - (AIN00262)

- Extended_Ringing parameter for internal send to resource (59006320)

  SOC option code AIN Service Enablers Release 6, Extended_Ringing Parameter Support - (AIN00263)

- UPDCI - CI interface to simulate and test ‘Change status of MWI’ Update messages (SR10208883)

In NA012, AIN implements partial requirements from the following specifications:

- GR-1298-CORE, *AINGR: Switching Systems*, Issue 4, Bellcore, July 1996
- GR-1299-CORE, *AINGR: Switch—Service Control Point (SCP)/Adjunct Interface*, Issue 4, Bellcore, July 1996
- GR-1129-CORE, *AINGR: Switch—Intelligent Peripheral Interface (IPI)*, Issue 2, Bellcore, July 1996
- GR-2892-CORE, *Switching and Signaling Generic Requirements for Toll-Free Service using Advanced Intelligent Network*, Issue 1, Bellcore, April 1995

2.9.1 Line attribute response processing (provisioning) (59008267)

This feature allows line attributes to be assigned against individual SDS trigger items in table TRIGITM. This better aligns the DMS AIN data model with the Bellcore model for administering line attributes and facilitates future generalization of this functionality to other trigger types.

Table PODPATTR was used in earlier releases for the administration of line attributes for SDS triggers that are defined in either the trigger group or trigger item provisioning interfaces. In NA012, table PODPATTR is only used to administer line attribute assignments to SDS triggers that are defined in the trigger group provisioning interface.

During an ONP, SDS trigger item definitions are enhanced to include relevant line attribute assignment functionality that is equivalent to those associated with trigger SDS in table PODPATTR (in the earlier software releases).

2.9.1.1 Application

When trigger SDS is encountered and the DMS-100 switch launches a query to the SCP, the SCP can screen and modify the call characteristics such as the

calling DN, the carrier, and the called DN. The originator could have class of service or a pre-translator that restricts toll calls in a certain way (for example, 900, 976, all toll calls), specified by its line attribute in the SSP.

This feature enables the telephone operating company to specify a different line attribute to be used when the trigger is encountered. The subscriber's class of service and pre-translator can be overridden for the service initiated by trigger SDS. This bypasses any toll limitation exercised by the original line attribute's characteristics.

2.9.1.2 Limitations

AIN line attribute response processing (provisioning) (59008267) has no limitations.

2.9.1.3 Optionality

AIN line attribute response processing (provisioning) (59008267) is controlled under the SOC option AIN Service Enablers Release 6 - Base (AIN00260).

2.9.2 Redirection interworking with events and trigger O_BNA (59010421)

This activity provides better isolation between the originating and terminating portions of an AIN call for events and triggers. It does not provide multiple extended TCAP transactions within the same half call. This activity removes the following limitations:

- when an originating half call is created, any existing open transactions are closed during call redirection
- when an originating half call is created, existing triggers O_Called_Party_Busy and O_No_Answer are deactivated during call redirection
- on a two-party call, a Request_Report_BCM_Event is closed when an open transaction with NEL exists on the call
- when the O_No_Answer event or trigger is enabled on a call, the T_No_Answer event does not arm, and trigger T_No_Answer does not activate

2.9.2.1 Application

AIN originating and terminating-based services can run independently.

2.9.2.2 Limitations

Limitations for this activity are as follows:

- this activity provides functionality for multiple transactions, but it does not provide multiple transactions within the half call capability
- triggers O_Called_Party_Busy and O_No_Answer are not in effect on a new call half created by any form of redirection

- this activity does not enhance calls that originate from an attendant console or calls that are extended by an attendant console
- this activity does not enhance call half independence for two-party calls that are extended

2.9.2.3 Optionality

Redirection interactions with Busy/NoAnswer triggers is controlled by SOC option AIN Service Enablers Release 5 - Base (AIN00250).

2.9.3 Increase virtual ports (59006039)

To allow AIN triggers and NELs to work properly after redirections take place, snapshots of the call data are saved when any of the following takes place:

- SDS with LARP
- PODPATTR
- NELs
- VFG
- DISA
- terminating trigger
- switch-based call forwarding

The number of snapshots that can be taken is 16, however, it is possible (depending upon the call scenario) to exceed this limit. The existing redirection chaining limit and AIN max serial triggers count remain applicable.

When no more snapshots can be taken and a NEL is requested by the SCP, the NEL is closed, otherwise the call is routed to no software resources treatment (NOSR) and in both cases the AIN OM AUGPEXH increments.

This feature also lowers the maximum provisioned value for the office parameter AIN_MAX_SERIAL_TRIGGERS from 25 to 8. The required value is 6 in Bellcore GR-1298.

2.9.3.1 Application

Bellcore GR-1298 specifies that AIN_MAX_SERIAL_TRIGGERS will have a maximum value of 6, that serves as the default value. The range of the corresponding office parameter that operating company personnel are allowed to datafill in table OFCENG is 1 to 8 (NA012 and up). During an NA012 ONP, when the value of the office parameter AIN_MAX_SERIAL_TRIGGERS is greater than 8 in the active table data format, that value is converted to 8 in the inactive table data format.

2.9.3.2 Limitations

The maximum provision value for office parameter AIN_MAX_SERIAL_TRIGGERS is reduced from 25 to 8. The provision value of 8 remains over-compliant with the value of 6 required in Bellcore GR-1298.

2.9.3.3 Optionality

This functionality is tracked by AIN Service Enablers Release 6 SOC option: AIN00260, AIN SE R6 - Base.

2.9.4 DFIL logs-report datafill error in RTECHAR (SR10206878)

AIN response translations utilize ISDN translations in order to determine a valid route based on SCP provided parameters. When an Analyze Route or Forward Call response message is received at the SSP, the routing parameters are converted to ISDN routing characteristics. These routing characteristics are used to index table RTECHAR and determine a routing characteristic name (RCNAME). Failure to derive an RCNAME will result in calls receiving treatment as appropriate pretranslator mappings are not performed.

A new DFIL log titled “Datafill Error in table RTECHAR” will be used as an aid to establish correct response translations datafill. If an RCNAME cannot be derived during an Analyze Route or Forward Call processing, a DFIL log will be output indicating the routing characteristics used to index table RTECHAR.

2.9.4.1 Application

This enhancement aids in uncovering and diagnosing incorrect AIN response processing translations datafill.

2.9.4.2 Limitations

None

2.9.4.3 Optionality

The AIN response processing DFIL log is controlled under the SOC option AIN Service Enablers Release 6 - Base (AIN00260).

2.9.5 CAC dialing for equal access (SR10216514)

This activity modifies Analyze Route carrier selection for equal access casual calls. When an Analyze Route response is received without parameter Carrier or TrunkGroup, the call is routed to the CalledPartyID contained in the message. Prior to NA012, carrier selection at the SSP involved selecting either the carrier access code (CAC) dialed prior to encountering an AIN trigger or the Carrier returned by a previous Analyze Route response within the same call half (the one that arrives last is used). When neither of these carriers were present, or they could not carry the type of traffic identified by the CalledPartyID, the originators PIC or LPIC was used to route the call.

Similarly, when the call could be routed by the LEC, the CAC or previously returned carrier was not used.

Following the enhancements provided by this feature, when an Analyze_Route response message without Carrier or TrunkGroup is returned from the SCP, the call is always routed using the CAC or carrier returned by a previous Analyze_Route response message (the one that arrives last is used) regardless of the CalledPartyID contents. When this carrier cannot carry the traffic, the call is sent to treatment.

2.9.5.1 Application

This enhancement provides additional Bellcore compliance for EA casual calls that encounter AIN.

2.9.5.2 Limitations

None

2.9.5.3 Optionality

The AIN equal access CAC dialing enhancements are controlled under the SOC option AIN Service Enablers Release 6 - Base (AIN00260).

2.9.6 AIN network tools upgrade (SR10202203)

AINTrace and TSTQuery functionality is enhanced in NA012 to support the tracing and display of parameter DisplayText in an AuthTerm or OfferCall response message and parameter ExtendedRinging support in an STR response message.

2.9.6.1 Application

AINTrace and TSTQuery functionality allows the operating company to verify AIN Service Enablers messages and parameters that are supported by the DSM-100 SSP. This feature provides the customer with the ability to view messages as they are received and sent from the SSP.

2.9.6.2 Limitations

Messages and parameters supported by TSTQuery and AINTrace are limited to those supported by the DMS-100 SSP. The set of queries that TRAVER builds is limited to the set of the trigger detection points (TDPs) and triggers that TRAVER supports. GAME should support all the parameters that are supported by AINTrace and TSTQuery.

2.9.6.3 Optionality

The network tools enhancements activity is included under the SOC Option Code AIN Service Enablers Release 5-Base (AIN00250).

2.9.7 Support DisplayText for MADN/EBS [Auth_Term, Offer_Call] (SR10206792)

Parameter DisplayText contains display information for the called party's customer premises equipment (CPE) and can be received in an Authorize Termination or Offer Call response message. Multiple appearance directory number (MADN) is a Centrex capability for groups of business phones.

This activity manages the delivery of AIN DisplayText to members of MADN groups, for all agents that support AIN Authorize Termination or Offer Call response messages.

2.9.7.1 Application

This activity extends AIN-based calling name services to MADN customers.

2.9.7.2 Limitations

This feature does not extend AIN Display text support to MADN agents not supported by AIN.

2.9.7.3 Optionality

AIN DisplayText for MADN is controlled under the SOC option AIN Service Enablers Release 6 - BRI MDN DpTxt (AIN00261).

2.9.8 Support DisplayText for BRI [Auth_Term, Offer_Call] (59006414)

Parameter DisplayText contains display information for the called party's customer premises equipment (CPE) and can be received in an Authorize Termination or Offer Call message. This activity extends the delivery of parameter DisplayText information to ISDN NI-1, NI-2, and MFT agents.

2.9.8.1 Application

This activity extends AIN-based calling name services to BRI agents.

2.9.8.2 Limitations

Feature address, original called name, and the redirecting reason of AIN DisplayText tags is not supported.

2.9.8.3 Optionality

AIN DisplayText for ISDN BRI agents is controlled under the SOC option AIN Service Enablers Release 6 - BRI MDN DpTxt (AIN00261).

2.9.9 Monitor_For_Change for hunt groups (59006290)

This activity modifies existing SSP processing of the AIN monitor for change message to support monitoring of Hunt groups. Prior to NA012, monitor for change functionality enabled the SSP to process a monitor for change request from the SCP to query the status, either busy or idle, of an analog line, or an ISDN BRI line. In NA012 this functionality is enhanced to support monitoring of hunt group status. The SCP can request the SSP to monitor a hunt group for

a time period until the hunt group has changed to the desired status or until the timer period expires.

The SCP sends the facility group ID in the monitor for change message to monitor a hunt facility on the SSP.

2.9.9.1 Application

The feature allows the SCP to request that the SSP monitor the status of hunt groups. The SCP can use this information for call completion services (for example, an AIN-based network wide ring again feature).

2.9.9.2 Limitations

AIN monitor for change enhancement for hunt groups supports only multi-line hunt groups.

2.9.9.3 Optionality

AIN monitor for change enhancement for hunt groups is controlled by the SOC option AIN Service Enablers Release 6 - MonChngHuntGr (AIN00262).

2.9.10 Extended_Ringing parameter support (59006320)

The SSP processing of the Send_To_Resource message is expanded to provide the extended ringing functionality for the O_No_Answer trigger and event.

The service provider can continue to offer the call to the called party when the Send_To_Resource message is received in a Conversation package, while the announcement is played, and to cancel the announcement when the called party answers. The SCP/Adjunct can request this extended ringing capability of the switch by including parameter ExtendedRinging in the Send_To_Resource message. After receiving an O_No_Answer (O_NOA) query from the service switching point (SSP) for a given call, the service control point (SCP) or adjunct can return a Send_To_Resource (STR) message to request that the SSP route the call to an internal resource. With ER capability, the service provider can continue to provide ringing to the called party, while the caller is played an announcement and prompted for digit collection. When the called party answers the call during the play announcement and collect digit phase, the announcement and digit collection are cancelled and both calling and called party are connected.

2.9.10.1 Application

Service providers using the switch-based special delivery service (SDS) are able to migrate their service onto the AIN platform, because the full behavioral functionality is provided with the support of the extended ringing capability.

2.9.10.2 Limitations

The following limitations are associated with the AIN extended ringing feature:

- The extended ringing functionality is only allowed for Send_To_Resource internally. The extended ringing capability is not supported for connections to a local or remote IP.
- The extended ringing capability is supported for the AIN O_NOA trigger and event. No other triggers or events are supported.
- Extended ringing is not supported when interacting with conference features (for example, 3WC).

2.9.10.3 Optionality

Extended ringing functionality is provided under the AIN Service Enablers Release-6 Software Option Code (AIN00263).

2.9.11 UPDCI - CI interface to simulate and test 'Change status of MWI' Updatemessages (SR10208883)

UPDCI increments an existing CI tool, MWQ. MWQ is an existing tool that allows operating companies to place messages in a queue (or remove them from the queue) for Message waiting feature subscribers. AIN Update 'Change status of MWI' messages introduced in NA010, allowed the SCP to activate and deactivate the message waiting indicator for a subscriber.

2.9.11.1 Application

This activity allows the operating company to place 'change status of MWI' Update messages in a queue (or remove them from the queue) on the switch, without actually sending the messages from the SCP. The UPDCI interface allows the operating company to verify the status of messages queued by an Update message from the SCP and remove them from the queue.

Note: The UPDCI increment reuses the Update MWI software component on the switch to queue messages and remove them from the queue. There is no difference in functionality between a message that is queued through the Update message or through UPDCI.

2.9.11.2 Limitations

UPDCI can simulate 'change status of MWI' Update messages only for Stuttered dial tone and lamp indications.

2.9.11.3 Optionality

The UPDCI activity is not optionalized.

2.10 NA011 development

The information in this section summarizes the NA011 content for AIN Service Enablers. Nortel Networks reserves the right to change the scope of the work or limitations associated with the software.

NA011 AIN development provided the following capabilities:

- AIN prefix triggers
  - — Specified_Carrier (SOC AIN00252)
  - — One_Plus_Prefix (SOC AIN00251)
  - — International (SOC AIN00253)
  - — Operator_Services (SOC AIN00254)
- the Offer_Call response message (SOC AIN00255)
- the expansion of table DNFEAT (LOC00256)
- secondary directory number subscription enhancement
- AIN on attendant console Send_To_Resource (STR) basic
- enhancements to network tools
  - — AINTrace
  - — TSTQuery
  - — TRAVER, AINMQG option
- enhancements to TCAP TRID management
- AIN Primer (AIN 0.0) retirement
- SOC support for NA011 functionality
- enhancements to automatic message accounting (AMA)

AIN Service Enablers for NA011 implements the following specifications:

- GR-1298-CORE, *AINGR: Switching Systems*, Issue 4, Bellcore, July 1996
- GR-1299-CORE, *AINGR: Switch—Service Control Point (SCP)/Adjunct Interface*, Issue 4, Bellcore, July 1996
- GR-1129-CORE, *AINGR: Switch—Intelligent Peripheral Interface (IPI)*, Issue 2, Bellcore, July 1996
- GR-2892-CORE, *Switching and Signaling Generic Requirements for Toll-Free Service using Advanced Intelligent Network*, Issue 1, Bellcore, April 1995

2.10.1 AIN prefix triggers (AJ5245)

AIN prefix triggers modifies the current AIN originating call model (OCM) call processing to support the introduction of four prefix triggers: Specified_Carrier, One_Plus_Prefix, International, and Operator_Services.

The four Prefix triggers are detected (although not all four are detected at the same time) at the Info_Analyzed TDP, when one of the following scenarios occurs:

- the customer dials a specific pattern of prefix digits before the main digit string (the triggering source is a call that originates from a line)
- the SCP or adjunct response contains parameter Prefix or parameter nature of number (the triggering source is an SCP response)
- an ISUP message contains CarrierSelectionInformation or the nature of address field in parameter CalledPartyNumber (the triggering source is an ISUP trunk)
- a PRI SETUP message contains specific parameters, such as TransitNetworkSelector, or OperatorSystemAccess (the triggering source is a PRI trk message)

For more detailed information on Prefix trigger detection see the following references:

- trigger Specified_Carrier, see Section 7.10.3 “Specified_Carrier trigger detection and processing” on page 339
- trigger One_Plus_Prefix, see Section 7.11.3 “One_Plus_Prefix trigger detection and processing” on page 343
- trigger International, see Section 7.12.3 “International trigger detection and processing” on page 347
- trigger Operator_Services, see Section 7.13.3 “Operator_Services trigger detection and processing” on page 351

Operating company personnel can assign these triggers to individual subscribers, a group, or to an entire central office using the trigger item provisioning interface.

AIN prefix triggers implement parameter Prefix in SCP response messages that allow trigger One_Plus_Prefix to be encountered.

2.10.1.1 Application

AIN prefix triggers gives the operating company added flexibility in routing calls that meet the previous criteria depending on response information sent by the SCP. This allows established service providers to resell local exchange carrier (LEC) operator services to new providers (known as unbundling of services).

2.10.1.2 Limitations

Prefix trigger limitations are as follows:

- Operating telephone company (OTC) carrier line origination calls can encounter trigger Specified_Carrier on the available digit string information. OTC and FGC (ISUP) trunk origination calls are not able to encounter trigger Specified_Carrier because of a lack of information. The information is missing because parameter carrier selection information (CSI) is not available.
- For ISDN BRI lines, Prefix triggers can only be assigned on an LTID-basis. Prefix triggers cannot be assigned on a call type (CT) basis.
- Attendant console and E911 agents are not supported.
- 10 “3 digits CIC” NPA NXX-XXXX and 101 “4 digits CIC” NPA NXX-XXXX are invalid formats for NI-2 PRI trunks. Trigger Specified_Carrier is not detected on these translated digits patterns.
- An ACB/AR type call should not encounter Prefix triggers when the ACB/AR SOC option, AIN00018, is idle (for example, when it has not been activated).
- ISUP trunk origination calls are not able to encounter trigger One Plus because of a lack of information. The digit 1, when dialed from a line, is be stripped off by translations prior to being outpulsed over an ISUP trunk.

2.10.1.3 Optionality

The following SOC option codes provide optionality for the Prefix triggers functionality:

- AIN Service Enablers Release 5 - Spfd Cxr Pfx (AIN00252), provides AIN Service Enablers Specified_Carrier Prefix trigger functionality
- AIN Service Enablers Release 5 - OnePlus Pfx (AIN00251), provides AIN Service Enablers One_Plus_Prefix trigger functionality
- AIN Service Enablers Release 5 - Intnl Pfx (AIN00253), provides AIN Service Enablers International Prefix trigger functionality
- AIN Service Enablers Release 5 - OperSvcs Pfx (AIN00254), provides AIN Service Enablers Operator_Services Prefix trigger functionality

2.10.2 Offer_Call response message (AU3180)

This activity expands the response message set that is received by the SSP to include the Offer_Call message. An Offer_Call message can be sent as a response to the T_Busy trigger or event, or in a conversation message when accompanied by a Request_Report_BCM_Event. The called party must subscribe to call waiting (for a non-ISDN line), or additional call offering (for BRI) in order to use Offer_Call functionality.

This activity modifies the T_Busy query by indicating in parameter Busy_Type, whether or not the call can be offered.

The Offer_Call message requests the SSP to offer the call to the called party (continue call processing and try to complete the call when possible). When parameter Display_Text is present in the message, the SSP attempts to deliver this information to the called party. Parameter Controlling_Leg_Treatment, when present, allows the application of a distinctive alerting pattern to the called party. When parameter CallingPartyID is included it is used in subsequent call processing.

2.10.2.1 Application

The Offer_Call response provides flexibility in defining AIN terminating call services associated with a called party busy condition. By allowing control over the display text and alerting pattern, it is possible to provide more customized information to users of call waiting or additional call offering (switch-based) features.

2.10.2.2 Limitations

Parameters Amp1, Amp2, ServiceProviderID and ServiceContext are not supported in the Offer_Call response message.

2.10.2.3 Optionality

SOC Option Code AIN Service Enablers Release 5 - Offer Call (AIN00255) provides optionality for the Offer_Call response message functionality.

2.10.3 DNFEAT table expansion

This feature expands the capacity of table DNFEAT to allow up to 128 000 unique DNs, with an increased data space to hold the option specific data for the DNs.

Table DNFEAT had a capacity of 16 382 unique DNs. Each option on a DN that has DN-specific data, stores this information in a separate data area. This data area had a capacity of 32 000 options. The introduction of this feature increases capacity to store 128 000 unique DNs and 512 000 options.

2.10.3.1 Application

For the AIN product, this feature allows an increase in the number of DNs that can subscribe to terminating call model (TCM) triggers, using the AINDN option in table DNFEAT. Other features that make use of options in DNFEAT can also make use of this increased capacity. Regardless of the number of AIN trigger items assigned to a particular DN (using the AINDN option), only the data area for a single option is consumed per DN for the AINDN option.

2.10.3.2 Limitations

Once the SOC code for this feature is turned ON, it cannot be reset to IDLE.

2.10.3.3 Optionality

SOC Option Code (LOC00256) is required to utilize more than 32 767 entries in table DNFEAT.

2.10.4 Secondary directory number subscription enhancement (AU3386)

AIN Service Enablers is enhanced to automatically propagate terminating AIN subscriptions from the primary directory number of a line to any N or P type secondary directory numbers on that line.

This enhancement affects provisioning and trigger criteria checking only. There are no changes to query processing, response processing, or AMA recording.

During the ONP process, the following events occur:

- subscriptions on type N or P secondary directory numbers are deleted
- a warning message is displayed when the subscription that is deleted is not the same as that of the primary directory number (the warning message shows the subscribing directory number and the AIN directory number subscription information)
- no warning message is displayed when the subscription that is deleted is the same as the primary directory number

2.10.4.1 Application

This activity reduces the cost of ownership by eliminating the need to provision triggers on N or P type secondary directory numbers independently of the primary directory numbers. This ensures AIN service provisioning is more consistent with provisioning for switch-based features.

2.10.4.2 Limitations

There are no known limitations or restrictions associated with this activity.

2.10.4.3 Optionality

The secondary directory number subscription enhancement feature is included under the base SOC Option Code AIN Service Enablers Release 5 - Base (AIN00250).

2.10.5 AIN on attendant console - STR Basic (AJ5018)

This activity modifies AIN support for the attendant console agent. It permits the handling of the Send_To_Resource response message for playing internal (DMS-100 SSP) announcements.

2.10.5.1 Application

This activity allows consoles involved with GR-2892 calls (toll-free service) to route to internal DMS-100 SSP announcements. This capability is a necessary step towards the eventual replacement of E800 service with AIN.

2.10.5.2 Limitations

Limitations and restrictions for this activity are as follows:

- The Send_To_Resource response to an external IP (using PRI, ISUP or any other connection) is not supported.
- Digit collection of any type is not supported.
- Conversation-type packages are not supported (only response-type packages are supported).

2.10.5.3 Optionality

AIN on Attendant Console - STR basic functionality is included under the base SOC Option Code AIN Service Enablers Release 5 - Base (AIN00250).

2.10.6 Network tools enhancements (AU3182)

AINTrace and TSTQuery functionality is enhanced to support the tracing and display of the Offer_Call message, and queries for the prefix triggers.

AINTrace is enhanced to observe (in real-time) messages as they are sent and received. This activity extends the set of parameters that are supported by the TRAVER AINMQG option.

2.10.6.1 Application

Applications for this activity are as follows:

- allows the operating company to verify AIN Service Enablers messages and parameters that are supported by the DMS-100 SSP
- provides the customer with the ability to view messages as they are received and sent from the SSP
- extends the level that the TRAVER AINMQG option simplifies the use of the TSTQuery tool

2.10.6.2 Limitations

Messages and parameters supported by TSTQuery and AINTrace are limited to those supported by the DMS-100 SSP. The set of queries that TRAVER builds, is limited to the set of trigger detection points (TDPs) and triggers that TRAVER supports.

2.10.6.3 Optionality

The network tools enhancements activity is included under the base SOC Option Code AIN Service Enablers Release 5 - Base (AIN00250).

2.10.7 Enhancements to TCAP TRID management (AU3341)

This activity converts AIN applications to use identifier pools (IDPLs) to allocate transaction identifiers. In previous releases transaction identifiers were allocated through datafill in table TCAPTRID. The datafill required a

generous allowance for the demands of peak activity periods, but it had to be low enough so that it did not waste switch memory.

The IDPL system for managing transaction identifiers automatically increases the pool size to meet switch demands.

2.10.7.1 Application

This activity alleviates the need to engineer datafill in table TCAPTRID for AIN applications. The risk of AIN calls failing because of a lack of transaction identifiers is eliminated.

2.10.7.2 Limitations

There are no known limitations for this activity.

2.10.7.3 Optionality

AIN TCAP TRID replacement is included under the base SOC Option Code AIN Service Enablers Release 5 - Base (AIN00250).

2.10.8 AIN Primer (0.0) retirement (AU3201)

This activity disables the AIN Primer functionality on the DMS-100 SSP.

2.10.8.1 Application

AIN 0.0 Primer functionality that is retired by this feature consists of the following five triggers:

- trigger *XX
- trigger directory number (DN)
- AIN 0.0 Off-Hook_Immediate (OHI) trigger for lines (this trigger is set up using trigger DN)
- AIN 0.0 automatic flexible routing (AFR) trigger for trunks (this trigger is set up using trigger DN)
- 3/6/10 digit POTS trigger

Prior to NA011, the above functionality corresponded to the tracked SOC option code AIN00001. This SOC code is also retired by the present feature work. Before they were retired, the AIN Primer triggers were set up by adding AIN Primer-specific datafill in five general translations tables (DNROUTE, subtable HNPACONT.HNPACODE, IBNXLA, IBNFEAT and KSETFEAT). These triggers are retired in NA011 in such a way that, although the existing datafill is preserved during a software upgrade, a call to an AIN Primer trigger is sent to the “feature not allowed” (FNAL) treatment. Attempts to add entries for AIN Primer triggers in any of these five tables (above) are blocked by the table editor and SERVORD, and an error message is displayed explaining that AIN 0.0 Primer has been retired as of NA011.

Upon detecting an AIN Primer trigger, TRAVER displays a message to inform the user that an AIN Primer trigger has been encountered and that the call is routed to the “feature not allowed” (FNAL) treatment because AIN Primer is retired as of NA011.

AIN Primer triggers were originally introduced as an enhancement to the private virtual network (PVN) functionality that was developed for MDC translations. MDC PVN Services functionality is not affected by the retirement of AIN Primer trigger functionality.

2.10.8.2 Limitations

All calls that encounter an AIN Primer trigger are routed to treatment.

2.10.8.3 Optionality

The AIN Primer (AIN 0.0) retirement activity is not optionalized.

2.10.9 Release 5 SOC support (AU3219)

NA011 software optionality control (SOC) introduces support for the selective activation and deactivation of major functions in NA011, including Offer_Call and Prefix triggers.

This activity provides the ability to update SOC usage counters and operational measurements for messages introduced in the NA011 release.

2.10.9.1 Limitations

There are no known limitations for this activity.

2.10.9.2 Base SOC order code

The functions in release NA011 that are controlled under the Base SOC option code (AIN Service Enablers Release 5 - Base (AIN00250) are as follows:

- AIN SE Network Tools Enhancements
- AIN SE AMA
- AIN SE Msg Enhancements
- AIN SE Attendant Console STR (Basic)
- AIN SE R5 SOC and OMs

2.10.9.3 Optionality

Release 5 SOC support is included under the base SOC Option Code AIN Service Enablers Release 5 - Base (AIN00250).

2.10.10 AIN AMA Enhancements (AF7743)

AIN AMA implements the required functionality to comply with GR-1298 and related ILRs for the following call processing functionality:

- prefix triggers
  - — Specific_Carrier
  - — One_Plus_Prefix
  - — International
  - — Operator_Services
- Offer_Call message

2.10.10.1 Application

AIN AMA enhancements are required to ensure proper revenue generating ability.

2.10.10.2 Limitations

No known limitations or restrictions are associated with this activity.

2.10.10.3 Optionality

The AIN AMA enhancement activity is included under the base SOC Option Code AIN Service Enablers Release 5 - Base (AIN00250).

2.10.11 Miscellaneous

This section describes functionality that is under development for NA011, but is not assigned to a specific ACTID.

2.10.11.1 T_No_Answer trigger/event interaction with CFDA

When the T_No_Answer trigger/event and call forward don't answer (CFDA, CFD, and CFGD) feature are both provisioned, the feature with the shortest no-answer timer is encountered. The feature with the longer no-answer timer is encountered for the call. This behavior is compliant to GR-1298 [749v2] -issue 4.

2.10.11.2 AIN Toll-free service ANI enhancements

Changes have been made in AIN toll-free service (TFS) to support a new ANI digit pair. Use ANI code 25 to identify pay phone originated TFS calls, where the toll free called number has been translated to a POTS routing number using the TFS database.

Previously, ANI code 24 was used for all TFS calls that had been translated to a POTS routing number, regardless of originator. Having a separate ANI code for pay phone originated calls, including inmate telephone service and private pay phones, is anticipated to simplify pay phone compensation for toll free calls.

Note: Only AIN TFS, as specified by Bellcore GR-2892, is covered by this functionality.

2.10.11.3 Triggers OCPB and ONOA limitations

Triggers OCPB and ONOA can be detected on the originating party only. Triggers OCPB and ONOA cannot be detected after a redirection occurs.

2.11 NA010 development

AIN NA010 development provided the following capabilities:

- an originating call model trigger: Channel_Setup_PRI
- two terminating call model triggers: T_Busy and T_No_Answer
- a terminating call model event: T_Answer TCM
- a control message: Collect_Information
- enhancements to several AIN network tools
  - — AINTrace
  - — TRAVER, and its AINMQG option
  - — TSTQuery
- extensions to the trigger item provisioning interface to allow provisioning of triggers that apply to groups and lines
- enhancements to the Update, and Update_Success messages
- enhancements to Automatic Message Accounting (AMA)
- expanded SOC options
- AIN message processing upgrades
- Escape OHD intercom for CENTREX
- Service Administration
- PRI FIE Expansion
- ACR trunk group/carrier routing control enhancements

2.11.1 Channel_Setup_PRI trigger

Trigger Channel_Setup_PRI (PRIB) is an AIN trigger applicable to the Info_Collected trigger detection point (TDP). This activity provides support for provisioning trigger PRIB and its criteria.

Trigger PRIB is assigned on a PRI B-channel basis. Trigger PRIB works with an escape code list. All incoming calls on a subscribed B-channel with digits that do not correspond to the escape code list, trigger to the SCP database. For trigger PRIB, the Info_Collected request message has its trigger criteria type set to channelSetupPRI.

This activity supports having AIN services subscribe to Primary Rate Interface (PRI) B-channels.

The user can use table control to control subscription to trigger PRIB. The user can assign trigger PRIB to a PRI B-channel that belongs to trunk group types IBNT2 and PRA. This is done with table AINPRI.

2.11.1.1 Application

This activity allows sharing of PRI for multiple customers. These customers can subscribe to different services, for example, office complex with shared PBX.

This activity provides direct subscription to trigger Channel_Setup_PRI instead of virtual area private networks (VAPN) trunks.

2.11.1.2 Limitations

The usefulness of trigger PRIB depends on the ability of the other end to request the appropriate B-Channel.

Users can provision trigger Channel_Setup_PRI with the trigger item provisioning interface only.

The call triggers when the selected B-channel at the Info_Collected TDP is subscribed. Do not assign trigger Channel_Setup_PRI to agents that have B-channel negotiation.

PRI looparound trunks do not support trigger PRIB. This limitation affects a PRI call that originates from a DMS-100 SSP and terminates on a DMS-100 switch. When trigger PRIB is assigned to a PRI looparound trunk, the specific call route cannot be determined unless all members have subscribed trigger PRIB.

The call triggers when the selected RBS channel at the Info_Collected TDP is subscribed. Trigger PRIB cannot be assigned to agents that have RBS channels negotiation.

Trigger PRIB inherits the DMS switch limitations for the Info_Collected message, for example, parameter AMP is not supported.

2.11.1.3 Development activities

The following activity introduces trigger Channel_Setup_PRI: AU2858.

2.11.2 T_Busy and T_No_Answer TCM triggers

This activity provides the operating company the ability to provide the terminating subscribers with triggers T_Busy and T_No_Answer functionality.

2.11.2.1 Application

This activity extends AIN terminating call model (TCM) support triggers T_Busy and T_No_Answer.

2.11.2.2 Development Activities

The following activity introduces triggers T_Busy and T_No_Answer: AJ5080.

2.11.3 T_Answer TCM event

This activity adds support for the T_Answer event to the terminating call model of AIN Service Enablers call processing.

The SSP encounters a T_Answer event when the EDP is armed and the SSP receives indication that the terminating access has answered the call.

2.11.3.1 Application

This activity enables call completion services. It gives operating companies more flexibility in developing AIN services in the terminating call half.

2.11.3.2 Limitations

This activity does not introduce limitations, however, it inherits conference, three way call, VFG, and call forwarding interaction limitations. This activity inherits the limitations of the Termination_Attempt message.

2.11.3.3 Development activities

The following activity introduces the T_Answer event: AU2784.

2.11.4 Collect_Information control message

The Collect_Information message is an AIN call control message that allows the SCP to resume call processing at the Collect_Information point-in-call. The Collect_Information message is received in either a Response package or a Conversation package when it is accompanied by a Request_Report_BCM_Event message. This activity allows the Collect_Information message as a reply to the following messages:

- Info_Analyzed
- Network_Busy
- O_Called_Party_Busy
- O_No_Answer

The Collect_Information message can contain any combination of the following parameters:

- AlternateDialingPlanInd
- AMA parameters

- Amp1
- Amp2
- CallingPartyID
- CollectedDigits
- DPConverter
- ServiceContext
- ServiceProviderID

The SSP routes the call by translating the dialing plan elements in parameter CollectedDigits against the dialing plan in force. The dialing plan in force is determined by the triggering agent (line, trunk, VFG, DISA) and the presence of a PODPATTR option assigned to a trigger. Parameter AlternateDialingPlanInd and its influence on establishing the dialing plan in force are not supported by this activity.

Phase I of Collect_Information Message processing includes the capability to process routing dial plan elements such as DNs and extension numbers as well as a subset of Vertical Service Codes. The permitted set of supported Vertical Service Code features in the dial plan elements are:

- CLASS Automatic Callback, for example, *66
- Calling Name/Number Delivery Blocking, for example, *67#6214321
- CLASS Automatic Recall
- AIN Specific/Public Feature Code Triggers

When the SCP specifies parameter CollectedDigits (that contains a complete dial plan element conforming to the dial plan of the triggering agent), but the dial plan element does not satisfy it, then the SSP collects digits until a translation result is determined. For example, when CollectedDigits contains the string *67, then the SSP prompts to collect the DN from the originator.

In addition to CollectedDigits processing, this activity provides the ability to modify calling party data according to the SCP provided parameter, CallingPartyID.

To allow the operating company personnel to validate Collect_Information processing, TRAVER includes an AINRES option, that verifies the first dial plan element in the CollectedDigits specified on the command line.

2.11.4.1 Application

This activity allows access to SSP functions.

2.11.4.2 Limitations

The NA010 version of the Collect_Information message does not support the following parameters:

- AlternateDialingP
- PlandInd
- DPConverter
- Amp1
- Amp2
- ServiceContext
- ServiceProviderID

This activity provides the ability to return a vertical service code in parameter CollectedDigits.

2.11.4.3 Development activities

The following activity introduces the Collect Information message: AJ5110.

2.11.5 AIN network tools

This activity adds support for AINTrace, TSTQuery, TRAVER, and manual query generation (MQG) tools for the NA010 release. These enhancements allow operating company personnel to monitor or simulate services using these messages and parameters.

This activity neither adds nor removes restrictions that existed in NA009 on these tools.

This activity supports messaging changes made in NA010 under the following features:

- AJ5080 Terminating triggers
- AJ5110 Collect Information
- AU2858 trigger Channel_Setup_PRI
- AU2901 GAME productization (AIN message processing upgrades)

Translation verification enhancements to TRAVER are part of these features whereas network testing enhancements to TRAVER AINMQG option and the AINTrace tool are part of activity AU2813.

2.11.5.1 AINTrace

This activity provides enhancements to the AINTrace tool to support NA010 parameters and messages.

2.11.5.1.1 Application AINTrace is an essential tool used by operating companies for diagnosing AIN network faults. To be effective the tool must support all capabilities of the NA010 message set.

2.11.5.1.2 Limitations This tool does not support unidirectional messages.

2.11.5.2 TSTQuery enhancements

TSTQuery enhancements let the tool support NA010 parameters and messages.

2.11.5.2.1 Application This tool assists in the debugging of the AIN network.

2.11.5.3 TRAVER enhancements

TRAVER enhancements provide accurate simulations of the NA010 AIN call processing.

2.11.5.3.1 Limitations TRAVER does not support BRI Feature Activators, therefore TRAVER cannot detect trigger BRI FA.

2.11.5.4 Manual Query Generation

This activity enhances the TRAVER manual query generation (MQG) option to let it use information collected with TSTQuery at the prefix triggers and trigger Channel_Setup_PRI. This activity enhances TRAVER-MQG to support valid AIN Service Enablers responses.

2.11.5.4.1 Applications The TRAVER MQG option simplifies the testing and simulation of AIN call scenarios.

2.11.5.4.2 Limitations This activity does not support triggers at the Network_Busy TDP.

2.11.6 Trigger items phase 2

The NA010 activity, AINSE Service Admin Phase II Triggers (CNA, CCM), provides a GR-1298 compliant trigger item provisioning interface for individual and group subscribed triggers (referred to as the DMS Trigger Item Interface). The NA010 release expands on the trigger item provisioning interface developed in NA009 for office based triggers.

The Trigger Item Interface supports all of the following AIN triggers:

- Off-hook_Immediate
- Off-Hook_Delay
- Shared_Interoffice_Trunk
- Specific_Feature_Code

- Public_Feature_Code
- Customized_Dialing_Plan
- Automatic_Flexible_Routing
- O_Called_Party_Busy
- O_No_Answer
- Termination_Attempt

The Trigger Item provisioning interface supports the activation and deactivation of subscriptions to trigger items, that are administrable through table control and can be modified by the Update message from the SCP.

Existing SERVORD, line query tools, and TRAVER support has been enhanced to support the subscription of agents to trigger items.

NA010 development provided the following functionality:

- TRAVER support for trigger items
- SOC support for trigger items
- a tool that automates the conversion of existing trigger group based datafill to equivalent trigger item datafill
- increased trigger item capacity to 64K tuples

2.11.6.1 Exclusions

Triggers developed during or after NA010 are supported in the trigger item provisioning model only. Trigger item support for triggers developed during or after NA010 is considered part of the development for that trigger.

The mapping of parameter Update message SSPUserResourceID to a DMS identifier is not included in this activity, nor is the testing of Update message functionality for triggers developed during or after NA010.

Support for the trigger status tool is excluded.

2.11.6.2 Application

Trigger items conform to Bellcore GR-1298, and allow easier management of AIN services.

By supporting a data model that facilitates the provisioning and management of triggers on an individual basis, the operating companies are better able to manage their AIN services on the SSP, an important attribute as more services are implemented and the network complexity grows because of third party service providers.

2.11.6.3 Development activities

The following activities introduce Trigger Items phase 2: AU2932, AU2933 and AU2934.

2.11.7 Update and Update_Success message enhancements

The Update message from the SCP allows it to activate and deactivate information in the SSP. The Update_Success message is the SSP response to the Update message.

In the case of failures, the SSP responds with either an ApplicationError message or a FailureReport message.

In NA010, with the completion of the trigger item data model, activation status of trigger items for all triggers can be controlled with the Update message. In addition, the Message Waiting indicator can be controlled with the Update message.

This activity provides enhancements to Update message, Update_Success message, call processing software, and to the following instances:

- supports call processing and non-call-processing messages and parameters for NA010
- allows the Update message to continue writing to the necessary protected data locations during an image dump

2.11.7.1 Application

This activity lets the SCP control voice mail notification.

2.11.7.2 Limitations

This activity has the following limitations:

- Activation status of trigger items assigned to a specific PRI B channel cannot be controlled with the update message.
- Activation status of the trigger items assigned to a customer group cannot be controlled with the update message.
- Update_Request message cannot change the activation status of triggers subscribed and provisioned with the trigger item data model.

2.11.8 SOC upgrade

The NA010 Software Optionality Control (SOC) functionality introduces controls to support selective activation and deactivation of major functions in this release. The following SOC options are provided:

- AIN Service Enablers Release 4 - Base (AIN00240), controls access to
  - — AIN SE network tools enhancements
  - — AIN SE trigger items, phase 2
  - — AIN SE Update message waiting indicators
  - — AIN SE Update Success message waiting indicators
- AIN Service Enablers Release 4 - ISDN I/W (AIN00241), controls access to:
  - — AIN SE PRI Channel Setup trigger
- AIN Service Enablers Release 4 - TCM Events (AIN00243), that controls access to:
  - — AIN SE T_Answer Event
  - — AIN SE Collect Information call packaging

This activity provides the ability to update SOC usage counters for NA010 messages.

2.11.8.1 Development activities

The following activity introduces the NA010 SOC options: AU2902.

2.11.9 AMA enhancements

This activity provides upgrades and enhancements required to support NA010 functionality identified in the previous sections.

2.11.9.1 Development activities

The following activities introduce the NA010 AMA upgrades: AJ7505, AJ7506, and AF7507.

2.11.10 AIN message processing upgrades

This activity provides upgrades to internal software to support call processing and non-call processing messages and parameters introduced in NA010.

2.11.10.1 Development activities

The following activity introduces the AIN message processing upgrades: AU2901.

2.11.11 Escape OHD Intercom for Centrex

The Off-hook_Delay (OHD) escape for Intercom Call is an enhancement to the current AIN processing of OHD triggers. It enables the SSP to escape trigger Off-hook_Delay for intercom calls placed within the Centrex group.

In this activity, the AIN software is enhanced to support the escape of trigger Off-hook_Delay for Intercom calls. An escape criteria is defined for OHD triggers that prevents the call from triggering when calls are placed within intercom range of a Centrex station.

2.11.11.1 Application

Trigger Off-hook_Delay can be assigned to lines within a Centrex group However, there are many public AIN services that can be offered to a Centrex station, that do not require a trigger to occur from the Centrex station when calls are placed within the Intercom range.

2.11.11.2 Development activities

The following activity introduces Escape OHD Intercom for Centrex: AU2867.

2.11.12 PRI FIE expansion

This activity allows DMS applications to receive FIEs up to 88 bytes from an external node, connected by PRI, in an incoming facility message.

2.11.12.1 Application

AIN is the lead application requiring large FIEs, but the functionality provided by this activity is generic and can be used by other PRI services or applications.

2.11.12.2 Development activities

The following activities introduce PRI FIE expansion: AJ5132 and AJ5133.

2.11.13 EACR trunk group/carrier routing control enhancements

This NA010 activity introduces office parameter AIN_ALT_ROUTE_SEL in table OFCENG, that allows the telephone operating company to separate control of route advance capability when routing a call over the trunk group parameters or carrier parameters included in the Analyze_Route or Forward_Call response.This feature is part of the AIN Service Enablers SSP product.

2.11.13.1 Application

This feature is part of the AIN Service Enablers SSP product.

2.11.13.2 Associated Activities

The activity number for this feature is SR1013.

3 Call model

AIN Service Enablers implement the call model shown in Figure 1 on page 116 and Figure 2 on page 117. The basic call model consists of the originating call model (OCM) and the terminating call model (TCM).

Figure 1 Originating call model

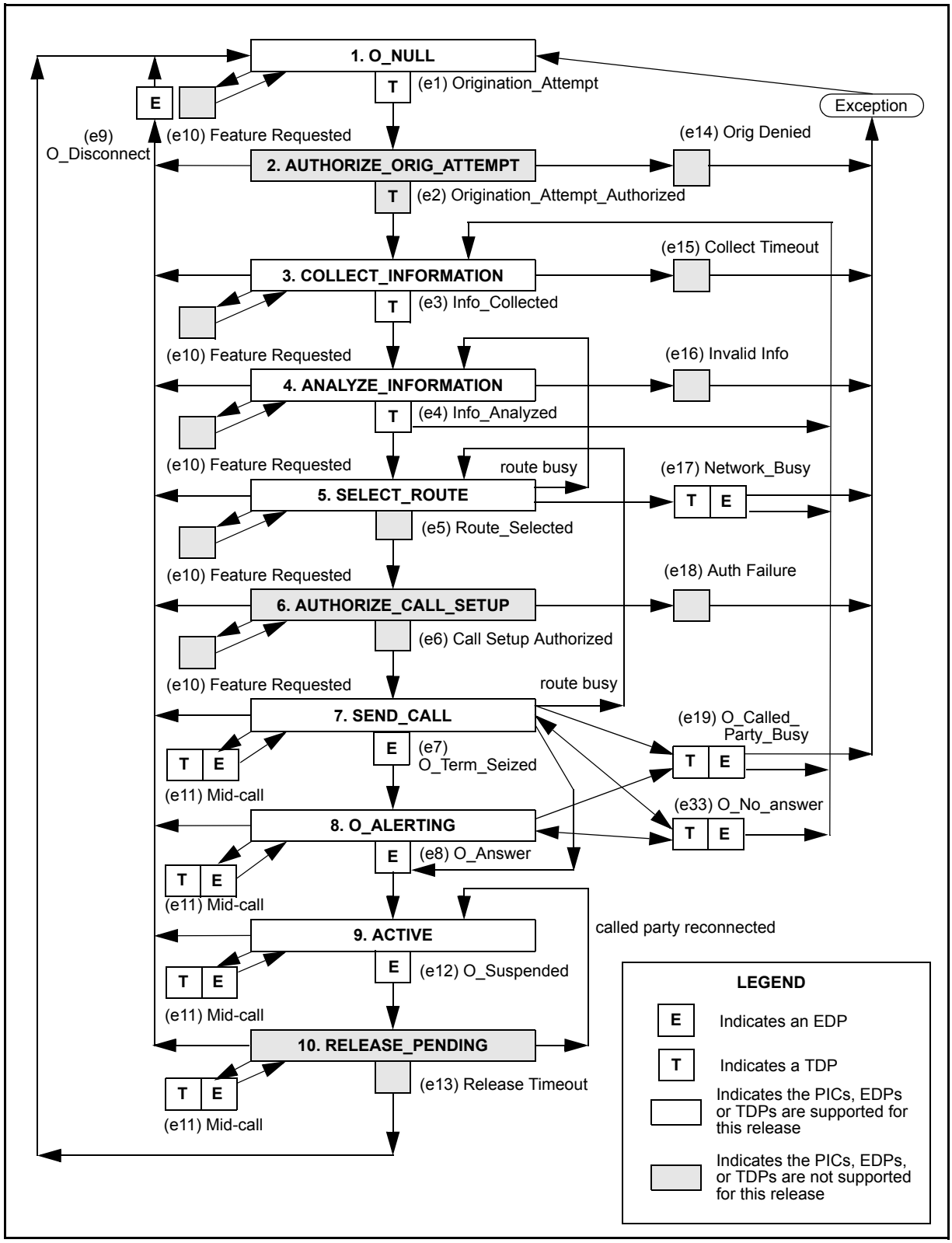
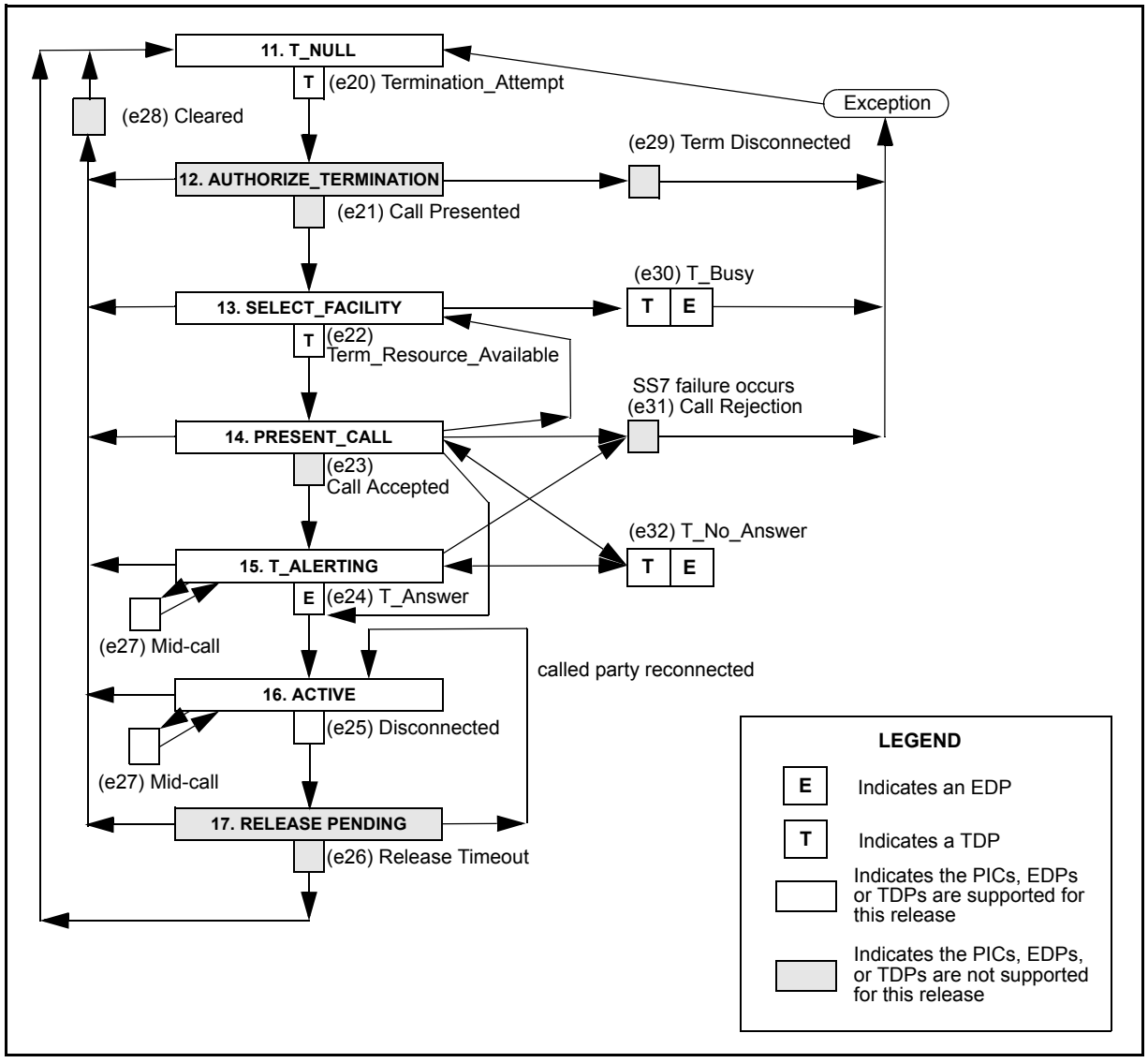


Figure 2 Terminating call model (continued)



3.1 Points in Call

The OCM and the TCM consist of blocks called points in call (PIC). A PIC identifies the state of the call processing and the required call information.

3.1.1 Trigger and event detection points

The OCM and the TCM contain trigger detection points (TDPs) and event detection points (EDPs).

TDPs are stages in the call where the SSP checks to see whether the call meets certain trigger criteria. When the call meets the trigger criteria for that TDP, the SSP suspends call processing and queries the SCP for further instructions.

When the call does not meet the trigger criteria, call processing proceeds to the next PIC. A TDP can have several triggers, with each trigger having its own criteria.

The SCP can respond to a trigger query with a Request_Report_BCM_Event (RRBCME) message and a next event list (NEL) instructing the SSP to arm one or more EDPs. When armed, EDPs are additional stages in the call where the SSP can send messages to the SCP, informing the SCP that the event occurred.

Events can be specified as notifications or as requests. Notifications communicate events to the SCP or adjunct, but do not intervene in the call. Requests communicate events to the SCP or adjunct and provide opportunities for the SCP or adjunct to intervene in the call. For example, the O_Answer event is a notification, whereas the O_Called_Party_Busy event and O_No_Answer event are requests.

When the SSP detects a requested event, the SSP sends the appropriate event request message to the SCP or adjunct. The SSP then erases the NEL, allowing the call to encounter any subsequent triggers in the call portion. When the SSP detects a notification event, the NEL is kept active until the SSP, SCP, or adjunct sends a Close message.

Operating company personnel assign triggers to individuals, groups, or to an entire central office.

Table 1 and Table 2 on page 145 show the TDPs and EDPs for the OCMs and TCMs.For these tables, shaded items are not supported. The table classifies detection points as either requests (req.) or notifications (not.). Table 1 and Table 2 on page 145 indicate whether triggers are individual (ind.), group, or the entire office. For these tables, shaded items are not supported.

Table 1 Originating call model trigger and event detection points

			Trigger item assignment			
Detection Point	**Classification**		**Trigger**	**Criteria**	**Assigned to**	
Origination_Attempt (e1)	TDP	Req	Off_Hook_ Immediate	call type	non-ISDN line	ind.
					DN/CT	
					BRI TSP	
					BRI Interface	
Origination_Attempt_ Authorized (e2)	TDP	Req	Origination_ Attempt_ Authorized	No Called Party Information Dialed	non-ISDN line	ind.
					DN/CT	
					BRI Interface	

Table 1 Originating call model trigger and event detection points (Continued)

			Trigger item assignment			
Detection Point	**Classification**		**Trigger**	**Criteria**	**Assigned to**	
Info_Collected (e3)	TDP	Req	Off_Hook_ Delay	call type, IBN trunk group, ISUP (except those in table ESC code)	ind.	non ISDN line
			PRI_B_ Channel (Channel_Set up_PRI)	except those in table ESC code	ind.	
			Shared_ Interoffice_ Trunk	call type, digits, escape table	ind.	
Info_Analyzed (e4)	TDP	Req	BRI_Feature_ Activation_ Indicator	call type, digits	BRI TSP	ind.
			Network_ Services	NSF with Facility Coding Value = Specified value and the Service Parameter Value = Null or Specified Facility group	PRI Interface	ind.
			Specific_ Feature_ Code	digits, call Type	RES line	ind.
					BRI line (Note 2)	
					BRI TSP	
			Public_ Feature_ Code	digits, call Type	RES line	ind.
			Customized_ Dialing_Plan	access code, 1-7 digit intercom code, call type, digits	customer group	group

Table 1 Originating call model trigger and event detection points (Continued)

			Trigger item assignment			
Detection Point	**Classification**		**Trigger**	**Criteria**	**Assigned to**	
Info_Analyzed (e4) (continued)			Specified_ Carrier	call type	non-ISDN interface BRI TSP DN/CT BRI trunks	Ind.
					all lines and trunks using a CDP or a BBG	group
					entire office	office
			One_Plus_ Prefix	call type	non-ISDN interface BRI TSP DN/CT BRI trunks	Ind.
					all lines and trunks using a CDP or a BBG	group
					entire office	office
			International	call type	non-ISDN interface BRI TSP DN/CT BRI trunks	Ind.
					all lines and trunks using a CDP or a BBG	group
					entire office	office

Table 1 Originating call model trigger and event detection points (Continued)

			Trigger item assignment			
Detection Point	**Classification**		**Trigger**	**Criteria**	**Assigned to**	
Info_Analyzed (e4) (continued)			Operator_ Services	call type	non-ISDN interface BRI TSP DN/CT BRI trunks	Ind.
					all lines and trunks using a CDP or a BBG	group
					entire office	office
			Specific_ Digit_String	NPA-NXX-XXX X with NPA mandatory, 3 to 10 contiguous digits, call type, escape code	entire office	office
			N11	N11, call type, digits	entire office	office
O_Term_Seized (e7)	EDP	Not.				
O_Answer (e8)	EDP	Not.				
Network_Busy (e17)	TDP	Req	Automatic_ Flexible_ Routing	call type	lines, customer group, trunks, entire office	group
	EDP	Req				

Table 1 Originating call model trigger and event detection points (Continued)

			Trigger item assignment			
Detection Point	**Classification**		**Trigger**	**Criteria**	**Assigned to**	
O_Called_Party_ Busy (e19)	TDP	Req	O_Called_ Party_Busy	line class code major class exclusion list of calling party DNs	non_ISDN line	ind.
					DN/CT	
					BRI TSP	
					BRI Interface	
					PRI Interface	
					all non-ISDN lines and ISDN interfaces assigned to an SDS, or to the entire SSP	office
	EDP	Req				
O_No_Answer (e33)	TDP	Req	O_No_ Answer	line class code major class exclusion list of calling party DNs	non_ISDN line	ind.
					DN/CT	
					BRI TSP	
					BRI Interface	
					PRI Interface	
					all non-ISDN lines and ISDN interfaces assigned to an SDS, or to the entire SSP	office
	EDP	Req.				

Table 1 Originating call model trigger and event detection points (Continued)

			Trigger item assignment			
Detection Point	**Classification**		**Trigger**	**Criteria**	**Assigned to**	
O_Mid_Call (e11)	TDP	Req.	O_Switch_ Hook_Flash_ Immediate	switchhook flash	non-ISDN line	ind.
			O_Feature_ Activator	BRI Feature Activator indication	BRI TSP BRI INterface	ind.
			O_Switch_ Hook_Flash_ Specified_ Code_Trigger	switchhook flash with digit collection	non-ISDN line	ind.
	EDP	Req.	Switch_Hook _Flash	switchhook flash detected		
			Feature_ Activator	FA detected		
			Timeout	Timeout detected		
O_Suspended (e12)	EDP	Req.	O_Suspend			
O_Disconnect (e9)	EDP	Req.	O_ Disconnect			
O_Disconnect_ Called (e9)	EDP	Req.	O_ Disconnect_ Called			

Note 1: The shaded areas are not currently supported.

Note 2: BRA MFT types of BRI lines are considered IBN lines and are not supported by triggers SFC and PFC.

Table 2 Terminating call model trigger and event detection points

			Trigger item assignment			
Detection Point	**Classification**		**Trigger**	**Criteria**	**Assigned to**	
Termination_Attempt (e20)	TDP	req.	Termination_ Attempt	call type	DN/CT	ind.

Table 2 Terminating call model trigger and event detection points (Continued)

			Trigger item assignment			
Detection Point	**Classification**		**Trigger**	**Criteria**	**Assigned to**	
Term_Resource_ Available (e22)	TDP	req.	T_Busy		non-ISDN line BRI interface	ind.
	EDP	req.				
T_Answer (e24)	EDP	Notify				
T_Busy (e30)	TDP	req.	T_Busy		non-ISDN line BRI interface	ind.
	EDP	req.				
T_No_Answer (e32)	TDP	req.	T_NoAnswer		non-ISDN line BRI interface	ind.
	EDP	req.				
T_Mid_Call (e27)	EDP	req.	Timeout	Timeout detected		
Note: The shaded areas are not currently supported.						

3.1.2 Trigger precedence

The DMS-100 trigger item provisioning interface uses two different levels to determine the first detected trigger when the criteria for many triggers is met on the same call.

The first level uses the category of the trigger subscription. Triggers subscribed to individuals are detected first, then those subscribed to groups, then those subscribed to the office. When the criteria for many triggers is met within one of these categories, the second level is used to determine precedence.

The second level uses a predetermined priority for each trigger based on, for example, Bellcore GR-1298. See Section 3.1.2.1.

3.1.2.1 Trigger precedence at Info_Analyzed TDP

At the Info_Analyzed TDP, trigger precedence is as follows:

- Specific_Feature_Code
- Public_Feature_Code
- Customized_Dialing_Plan
- Specified_Carrier
- One_Plus_Prefix
- International

- Operator_Services
- Specific_Digit_String
- N11

4 Agent support

AIN Service Enablers supports the agents listed in Table 2 through Table 11. Supported agents can encounter NEL and STR messages to an intelligent peripheral (IP).

The following table is a legend for the agent support tables found in this chapter:

Table 1 Legend for agent support tables

Name	Abbreviation
Automatic_Flexible_Routing	AFR
Channel_Setup_PRI	PRIB
Customized_Dialing_Plan	CDP
Encounter T_Busy trigger (see Note)	E_TBSY
Encounter T_No_Answer (see Note)	E_TNOA
Encounter Termination_Attempt (see Note)	E_TAT
Encounter Trunk Group Trigger	ETKTERM
International	INT
Line Class Code	LCC
N11	N11
Not applicable	N/A
Not supported	N/S
O_Called_Party_Busy	OCPB
O_No_Answer	ONOA
Off-hook_Delay	OHD
Off-hook_Immediate	OHI
One_Plus_Prefix	OPP

Table 1 Legend for agent support tables (Continued)

Name	Abbreviation
Operator_Services	OS
Partially supported	P/S
Public_Feature_Code	PFC
Shared_Interoffice_Trunk	SIT
Subscribe TKTERM Trigger	STKTERM
Supported by Primary Rate Interface (PRI) looparound trunks	PL
Supported	S
Specific_Digit_String	SDS
Specific_Feature_Code	SFC
Specified_Carrier	SC
Subscribe to T_Busy	S_TBSY
Subscribe to T_No_Answer	S_TNOA
Subscribe to Termination_Attempt	S_TAT
Term_Resource_Available	TRA
Trunk Group Type	TGT
Note: Encounter a trigger implies - Call originated by the Agent can encounter the specified Terminating trigger. The Terminating agent should be subscribed to the specified Terminating trigger.	

Table 2 and Table 3 on page 130 list POTS line trigger support.

Table 2 AIN Service Enablers POTS line trigger support (Part 1 of 2)

Type	LCC	Trigger (See the notes at the end of this table.)											
		OHI	OHD	PFC	SFC	CDP	SC	OPP	INT	OS	SDS	N11	AFR
Basic	1FR	S	S	N/S	N/S	N/A	S	S	S	S	S	S	S
	1MR	S	S	N/S	N/S	N/A	S	S	S	S	S	S	S
PBX	PBX	S	S	N/S	N/S	N/A	S	S	S	S	S	S	S
	PBM	S	S	N/S	N/S	N/A	S	S	S	S	S	S	S

Table 2 AIN Service Enablers POTS line trigger support (Part 1 of 2) (Continued)

Type	LCC	Trigger (See the notes at the end of this table.)											
		OHI	OHD	PFC	SFC	CDP	SC	OPP	INT	OS	SDS	N11	AFR
Coin	CCF	N/S	PL	N/S	N/S	N/A	S	S	S	S	S	S	S (note 1)
	CDF	N/S	PL	N/S	N/S	N/A	S	S	S	S	S	S	S (note 1)
	CFD	N/S	PL	N/S	N/S	N/A	S	S	S	S	S	S	S (note 1)
	CSP	N/S	PL	N/S	N/S	N/A	S	S	S	S	S	S	S (note 1)
	ZMD	N/S	PL	N/S	N/S	N/A	S	S	S	S	S	S	S (note 1)
	ZMZPA	N/S	PL	N/S	N/S	N/A	S	S	S	S	S	S	S (note 1)
WATS	2WW	N/S	PL	N/S	N/S	N/A	S	S	S	S	S	S	S (note 1)
	EOW	N/S	PL	N/S	N/S	N/A	S	S	S	S	S	S	S (note 1)
	ETW	N/S	PL	N/S	N/S	N/A	S	S	S	S	S	S	S (note 1)
	INW	N/S	PL	N/S	N/S	N/A	S	S	S	S	S	S	S (note 1)
	OWT	N/S	PL	N/S	N/S	N/A	S	S	S	S	S	S	S (note 1)
Party	2FR	S	S	N/S	N/S	N/A	S	S	S	S	S	S	P (note 2)
	4FR	S	S	N/S	N/S	N/A	S	S	S	S	S	S	P (note 2)
	8FR	N/S	PL	N/S	N/S	N/A	PL	PL	PL	PL	PL	PL	PL
	10FR	N/S	PL	N/S	N/S	N/A	PL	PL	PL	PL	PL	PL	PL

Table 2 AIN Service Enablers POTS line trigger support (Part 1 of 2) (Continued)

Type	LCC	Trigger (See the notes at the end of this table.)										
		OHI	OHD	PFC	SFC	CDP	SC	OPP	INT	OS	SDS	N11	AFR
Note 1: Group-based subscription and individual subscription are not applicable. ***Note 2:*** Office-based subscription only.There is no support for individual subscription and group based subscription. ***Note 3:*** Adding AIN to a POTS line with RES_SO_Simplification datafilled ON, converts the line to a RES line. ***Note 4:*** See Table 1 on page 127 for a description of the symbols used in this table.												

Table 3 AIN Service Enablers POTS line trigger support (Part 2 of 2)

Type	LCC	Trigger (See the notes at the end of this table.)							
		OCPB	ONOA	E_TAT	S_TAT	E_TBSY	S_TBSY	E_TNOA	S_TNOA
Basic	1FR	S	S	S	S	S	S	S	S
	1MR	S	S	S	S	S	S	S	S
PBX	PBX	S	S	S	S	S	S	S	S
	PBM	S	S	S	S	S	S	S	S
Coin	CCF	N/S	N/S	S	N/A	S	N/A	S	N/A
	CDF	N/S	N/S	S	N/A	S	N/A	S	N/A
	CFD	N/S	N/S	S	N/A	S	N/A	S	N/A
	CSP	N/S	N/S	S	N/A	S	N/A	S	N/A
	ZMD	N/S	N/S	S	N/A	S	N/A	S	N/A
	ZMZPA	N/S	N/S	S	N/A	S	N/A	S	N/A
WATS	2WW	N/S	N/S	S	N/A	S	N/A	S	N/A
	EOW	N/S	N/S	S	N/A	S	N/A	S	N/A
	ETW	N/S	N/S	S	N/A	S	N/A	S	N/A
	INW	N/S	N/S	S	N/A	S	N/A	S	N/A
	OWT	N/S	N/S	S	N/A	S	N/A	S	N/A
Party	2FR	S	S	S	N/S	S	N/S	S	N/S
	4FR	S	S	S	N/S	S	N/S	S	N/S
	8FR	N/S	N/S	S	N/S	S	N/S	S	N/S
	10FR	N/S	N/S	S	N/S	S	N/S	S	N/S

Table 3 AIN Service Enablers POTS line trigger support (Part 2 of 2) (Continued)

Type	LCC	Trigger (See the notes at the end of this table.)							
		OCPB	ONOA	E_TAT	S_TAT	E_TBSY	S_TBSY	E_TNOA	S_TNOA
Note 1: See Table 1 on page 127 for a description of the symbols used in this table. ***Note 2:*** Adding AIN to a POTS line with RES_SO_Simplification datafilled ON, converts the line to a RES line.									

Table 4 AIN Service Enablers RES line trigger support (Part 1 of 2)

Type	LCC	Trigger (See the notes at the end of this table.)											
		OHI	OHD	PFC	SFC	CDP	SC	OPP	INT	OS	SDS	N11	AFR
Basic	1FR	S	S	S	S	S	S	S	S	S	S	S	S
	1MR	S	S	S	S	S	S	S	S	S	S	S	S
Coin	CCF	N/S	S	S	S	P (note 1)	S	S	S	S	S	S (note 2)	P (note 3)
	CDF	N/S	S	S	S	P (note 1)	S	S	S	S	S	S (note 2)	P (note 3)
	CFD	N/S	S	S	S	P (note 1)	S	S	S	S	S	S (note 2)	P (note 3)
	CSP	N/S	S	S	S	P (note 1)	S	S	S	S	S	S (note 2)	P (note 3)
	ZMD	N/S	S	S	S	P (note 1)	S	S	S	S	S	S	P (note 3)
	ZMZPA	N/S	S	S	S	P (note 1)	S	S	S	S	S	S	P (note 3)
WATS	2WW	N/S	S	S	S	S	S	S	S	S	S	S	P (note 3)
	EOW	N/S	S	S	S	S	S	S	S	S	S	S	P (note 3)
	ETW	N/S	S	S	S	S	S	S	S	S	S	S	P (note 3)
	INW	N/S	S	S	S	S	S	S	S	S	S	S	P (note 3)
	OWT	N/S	S	S	S	S	S	S	S	S	S	S	P (note 3)

Table 4 AIN Service Enablers RES line trigger support (Part 1 of 2) (Continued)

Type	LCC	Trigger (See the notes at the end of this table.)										
		OHI	OHD	PFC	SFC	CDP	SC	OPP	INT	OS	SDS	N11	AFR
Note 1: The switch supports Access Code, but not Feature Access Code and Intercom/Extension. ***Note 2:*** The coin is collected based on a prequery call type. ***Note 3:*** Office-based subscription only.There is no support for individual subscription and group based subscription. ***Note 4:*** See Table 1 on page 127 for a description of the symbols used in this table.													

Table 5 AIN Service Enablers RES line trigger support (Part 2 of 2)

Type	LCC	Trigger (See the notes at the end of this table.)							
		OCPB	ONOA	E_TAT	S_TAT	E_TBSY	S_TBSY	E_TNOA	S_TNOA
Basic	1FR	S	S	S	S	S	S	S	S
	1MR	S	S	S	S	S	S	S	S
Coin	CCF	S	S	S	S	S	S	S	S
	CDF	S	S	S	S	S	S	S	S
	CFD	S	S	S	S	S	S	S	S
	CSP	S	S	S	S	S	S	S	S
	ZMD	S	S	S	S	S	S	S	S
	ZMZPA	S	S	S	S	S	S	S	S
WATS	2WW	S	S	S	S	S	S	S	S
	EOW	S	S	S	S	S	S	S	S
	ETW	S	S	S	S	S	S	S	S
	INW	S	S	S	S	S	S	S	S
	OWT	S	S	S	S	S	S	S	S
Note 1: Office-based subscription only. The switch does not support Individual subscription and group-based subscription. ***Note 2:*** See Table 1 on page 127 for a description of the symbols used in this table.									

Table 6 AIN Service Enablers IBN line trigger support (Part 1 of 2)

Type	LCC	Trigger (See the notes at the end of this table.)											
		OHI	**OHD**	**PFC**	**SFC**	**CDP**	**SC**	**OPP**	**INT**	**OS**	**SDS**	**N11**	**AFR**
Basic	IBN	S	S	N/A	N/A	S	S	S	S	S	S	S	S
	M5009	S	S	N/A	N/A	S	S	S	S	S	S	S	S
	M5112	S	S	N/A	N/A	S	S	S	S	S	S	S	S
	M5209	S	S	N/A	N/A	S	S	S	S	S	S	S	S
	M5212	S	S	N/A	N/A	S	S	S	S	S	S	S	S
	M5216	N/A	S	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	M5312	S	S	N/A	N/A	S	S	S	S	S	S	S	S
	M5316	N/A	S	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	PSET	S	S	N/A	N/A	S	S	S	S	S	S	S	S
Other	DATA	S	S	N/A	N/A	P	S	S	S	S	S	S	P (note 2)
	PDATA	S	S	N/A	N/A	P	S	S	S	S	S	S	P (note 2)
	VLN (for RCF)	N/A	N/A	N/A	N/A	N/A	S	S	S	S	S	S	P (note 2)
	ISDNKSET-MFT	S	S	N/A	N/A	S	S	S	S	S	S	S	S
	ISDNKSET-BRI (note 3)	S	S	S	S	S	S	S	S	S	S	S	P (note 2)
	AC (note1)	N/S	PL	N/A	N/A	PL	PL	PL	PL	PL	P	P	PL

Note 1: In this document, attendant console (AC) refers to the Nortel Networks Meridian digital centrex (MDC) Attendant Console. AC support for SDS, N11 and Encounter TAT triggers support an STR response of play announcement with internal switch resources only. All other STR requests are sent to AIN final treatment. Mini Consoles are not supported.

Note 2: Office-based subscription only. Individual subscription and group subscription are not supported.

Note 3: Subscription to BRI LTID is equivalent to BRI TSP identified by Telcordia.

Note 4: See Table 1 on page 127 for a description of the symbols used in this table.

Table 7 AIN Service Enablers IBN line trigger support (Part 2 of 2)

Type	LCC	Trigger (See the notes at the end of this table.)							
		OCPB	**ONOA**	**E_TAT**	**S_TAT**	**E_TBSY**	**S_TBSY**	**E_TNOA**	**S_TNOA**
Basic	IBN	S	S	S	S	S	S	S	S
	M5009	S	S	S	S	S	S	S	S
	M5112	S	S	S	S	S	S	S	S
	M5209	S	S	S	S	S	S	S	S
	M5212	S	S	S	S	S	S	S	S
	M5216	N/A	N/A	S	S	S	S	S	S
	M5312	S	S	S	S	S	S	S	S
	M5316	N/A	N/A	S	S	S	S	S	S
	PSET	S	S	S	S	S	S	S	S
Other	DATA	S	S	S	S	S	S	S	S
	PDATA	S	S	S	S	S	S	S	S
	VLN (for RCF)	N/S	N/S	S	N/A	S	N/A	S	N/A
	ISDNKSET-MFT	S	S	S	S	S	S	S	S
	ISDNKSET-BRI (note 3)	S	S	S	S	S	S	S	S
	AC (note 1)	N/S	N/S	P	N/S	N/S	N/S	N/S	N/S

Note 1: In this document, attendant console (AC) refers to the Nortel Networks Meridian digital centrex (MDC) on an Attendant Console. AC support for triggers SDS, N11, and Encounter TAT, supports an STR response of play announcement with internal resources only. All other STR requests are sent to AIN final (AINF) treatment. Mini Consoles are not supported.

Note 2: Office-based subscription only. Individual subscription and group subscription are not supported.

Note 3: Subscription to BRI LTID is equivalent to BRI TSP identified by Telcordia.

Note 4: See Table 1 on page 127 for a description of the symbols used in this table.

Table 8 AIN Service Enablers DN trigger support (Part 1 of 2)

Agent		Trigger (See the notes at the end of this table.)						
Type	**Class**	**OHI**	**OHD**	**PFC**	**CDP**	**SDS**	**N11**	**AFR**
DISA	IBN	N/S	S	N/S	N/S	N/S	N/S	S
AIN VDN	IBN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	NONIBN	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Note: See Table 1 on page 127 for a description of the symbols used in this table.								

Table 9 AIN Service Enablers DN trigger support (Part 2 of 2)

Agent		Trigger (See the notes at the end of this table.)							
Type	**Class**	**OCPB**	**ONOA**	**E_TAT**	**S_TAT**	**E_TBSY**	**S_TBSY**	**E_TNOA**	**S_TNOA**
DISA	IBN	N/A	N/A	N/S	N/S	S	N/S	S	N/S
AIN VDN	IBN	N/A	N/A	N/A	S	N/A	N/S	N/A	N/S
	NONIBN	N/A	N/A	N/A	S	N/A	N/S	N/A	N/S
Note: See Table 1 on page 127 for a description of the symbols used in this table.									

Table 10 AIN Service Enablers trunk trigger support (Part 1 of 2)

Agent	TGT	Trigger (See the notes at the end of this table.)											
		OHD	**SIT**	**CS_ PRI**	**CDP**	**SDS**	**SC**	**OPP**	**INT**	**OS**	**N11**	**AFR**	**ETKT ERM**	**STKT ERM**
Integrated Business Network (MF)	IBNT1	S	N/A	N/A	S	S	N/S	N/A	N/S	N/S	S	S	S	N/S
Integrated Business Network (ISUP)	IBNT1	S	N/A	N/A	S	S	S	N/A	S	S	S	S	S	N/S
Integrated Business Network (MF)	IBNT2	S	N/A	N/A	S	S	N/S	N/A	N/S	N/S	S	S	S	S
Integrated Business Network (ISUP)	IBNT2	S	N/A	N/A	S	S	S	N/A	S	S	S	S	S	S
Primary rate interface	PRA	S	N/A	S	S	S	S	S	S	S	S	S	S	S
Primary rate interface	IBNT2	S	N/A	S	S	S	S	S	S	S	S	S	S	S
Inter toll (MF)	IT	N/A	P	N/A	N/S	S	N/S	N/S	N/S	N/S	S	S	S	S
BICC DPT	IT	N/A	P	N/A	N/A	S	S	N/S	S	S	S	S	N/S	N/S
Inter toll (ISUP)	IT	N/A	P	N/A	N/S	S	S	N/A	S	S	S	S	S	S

Table 10 AIN Service Enablers trunk trigger support (Part 1 of 2) (Continued)

Agent	TGT	Trigger (See the notes at the end of this table.)												
		OHD	SIT	CS_ PRI	CDP	SDS	SC	OPP	INT	OS	N11	AFR	ETKT ERM	STKT ERM
Incoming end office (MF)	TI	N/A	N/A	N/A	N/A	S	N/S	N/S	N/S	N/S	S	S	S	N/S
Incoming end office (ISUP)	TI	N/A	N/A	N/A	P (not e 6)	S	S	N/A	S	S	S	S	S	N/S
Two-way end office (MF)	T2	N/A	N/A	N/A	N/A	S	N/S	N/S	N/S	N/S	S	S	S	S
Two-way end office (ISUP)	T2	N/A	N/A	N/A	P (not e 6)	S	S	N/A	S	S	S	S	S	S
Access to carrier (MF)	ATC	N/A	N/A	N/A	N/A	S	N/S	N/S	N/S	N/S	S	S	S	S
Access to carrier (ISUP)	ATC	N/A	N/A	N/A	N/A	S	S	N/A	S	S	S	S	S	S
PBX/DID	P2	N/A	N/A	N/A	N/A	S	S	S	S	S	S	P (note 7)	S	S
PBX/DID	PX	N/A	N/A	N/A	N/A	S	S	S	S	S	S	P (note 7)	S	S
Super CAMA	SC (note 1)	N/A	N/S	N/A	N/A	S	N/A	N/A	N/A	N/A	S	N/S	S	N/S
Outgoing CAMA	OC (note 2)	N/A	N/S	N/A	N/A	S	N/A	N/A	N/A	N/A	S	PL	S	N/S
Cellular 2A (MF)	CELL	S	N/S	N/A	N/A	S	N/S	N/S	N/S	N/S	P	P (note 4) (note 7)	S	S

Table 10 AIN Service Enablers trunk trigger support (Part 1 of 2) (Continued)

Agent	TGT	Trigger (See the notes at the end of this table.)												
		OHD	SIT	CS_ PRI	CDP	SDS	SC	OPP	INT	OS	N11	AFR	ETKT ERM	STKT ERM
Cellular 2A (ISUP)	ISUP IT (CELL 2A option)	S	N/S	N/A	N/A	S	S	N/A	S	S	P	P (note 4) (note 7)	UU	UU
Cellular 1/2B (MF)	PX (LOC ALCM C = Y)	N/A	N/S	N/A	N/A	S	N/S	N/S	N/S	N/S	S	P (note 4) (note 7)	UU	UU
Cellular 1/2B (ISUP)	ISUP IT (CELL 2B option)	S	N/S	N/A	N/A	S	S	N/A	S	S	P	P (note 4) (note 7)	UU	UU
Virtual access to private network	VAPN	S	N/A	N/A	P (not e 5)	S	S	S	S	S	N/S	P (note 7)	S	N/S
Enhanced 911	E911	N/A	N/A	N/A	N/A	N/S	N/S	N/S	N/S	N/S	N/S	N/S	S	N/S
Operator	OP (note 2)	N/A	N/A	N/A	N/A	S	N/A	N/A	N/A	N/A	S	N/S	S	N/S
Operator incoming	OI (note 2)	N/A	N/A	N/A	N/A	S	S	S	S	S	S	N/S	S	N/S
TOPS	TOPS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/S	N/S

Table 10 AIN Service Enablers trunk trigger support (Part 1 of 2) (Continued)

Agent	TGT	Trigger (See the notes at the end of this table.)											
		OHD	SIT	CS_ PRI	CDP	SDS	SC	OPP	INT	OS	N11	AFR	ETKT ERM	STKT ERM
Note 1: When the call involves SuperCAMA LEAS and AIN, operating company personnel must datafill the SuperCAMA trunk to carry equal access traffic. See document NTX710AA, LATA Equal Access System, Digital Switching Systems DMS - 100 Family General Feature Description for LEAS provisioning. When the SCP returns a Charge Number in its response after triggering, then the Charge Number must also be in table TRKLATA. Furthermore, when the response is to route the call directly to a DN, then operating company personnel must datafill table DNPIC or DNLPIC depending on whether the call is INTER LATA or INTRA LATA. The switch does not support N11 triggering for SuperCAMA trunks when it is a LEAS trunk. ***Note 2:*** The switch blocks Operator Verification calls on Outgoing CAMA (OC), Operator (OP) and Operator Incoming (OI) trunks from triggering on any of the AIN triggers. In addition, the switch also blocks Operator Number Identification (ONI) calls from triggering on any of the AIN triggers. When an incoming OP, OC, or OI call triggers N11, the switch supports all versions of Analyze Route responses except the one that directs the call to route to an IXC. ***Note 3:*** The switch supports returning a carrier in the Analyze Route response after triggering at N11 for the type 2B MF CELL trunks only. ***Note 4:*** Returning a carrier in the Analyze Route response after triggering at AFR is supported for the type 2B MF CELL trunks only. ***Note 5:*** CDP Access Code (AC) is supported, CDP Intercom/Extension (Ext) does not apply to VAPN trunks, the switch does not support CDP Feature Access Code (FAC). ***Note 6:*** An ISUP TI/T2 trunk call with an MBG parameter can encounter a CDP trigger. ***Note 7:*** Office-based subscription only. The switch does not support Individual subscription and group based subscriptions. ***Note 8:*** See Table 1 on page 127 for a description of the symbols used in this table.													

Table 11 AIN Service Enablers trunk trigger support (Part 2 of 2)

Agent	TGT	Trigger (See the notes at the end of this table.)						
		OCPB	ONOA	E_TAT	E_TBSY	S_TBSY	E_TNOA	S_TNOA
Integrated Business Network	IBNTI	N/S	N/S	S	S	N/S	S	N/S
Integrated Business Network	IBNT2	N/S	N/S	S	S	N/S	S	N/S
Primary rate interface	PRI	S	S	S	S	N/S	S	N/S
BICC DPT	IT	N/S	N/S	S	S	N/S	S	N/S
Inter toll	IT	N/S	N/S	S	S	N/S	S	N/S

Table 11 AIN Service Enablers trunk trigger support (Part 2 of 2) (Continued)

Agent	TGT	Trigger (See the notes at the end of this table.)						
		OCPB	ONOA	E_TAT	E_TBSY	S_TBSY	E_TNOA	S_TNOA
Incoming end office	TI	N/S	N/S	S	S	N/S	S	N/S
Two-way end office	T2	N/S	N/S	S	S	N/S	S	N/S
Access to carrier	ATC	N/S	N/S	S	S	N/S	S	N/S
PBX/DID	P2	S	S	S	S	N/S	S	N/S
PBX/DID	PX	S	S	S	S	N/S	S	N/S
Super CAMA	SC (note 1)	N/S	N/S	S	S	N/S	S	N/S
Outgoing CAMA	OC (note 2)	N/S	N/S	S	S	N/S	S	N/S
Cellular 2A (MF)	CELL	N/S	N/S	S	S	N/S	S	N/S
Cellular 2A (ISUP)	ISUP IT (CELL 2A option)	N/S	N/S	S	S	N/S	S	N/S
Cellular 1/2B (MF)	PX (LOCALC MC = Y)	N/S	N/S	S	S	N/S	S	N/S
Cellular 1/2B (ISUP)	ISUP IT (CELL 2B option)	N/S	N/S	S	S	N/S	S	N/S
Virtual access to private network	VAPN	N/S	N/S	S	S	N/S	S	N/S
Enhanced 911	E911	N/S	N/S	S	S	N/S	S	N/S
Operator	OP (note 2)	N/S	N/S	S	S	N/S	S	N/S
Operator incoming	OI (note 2)	N/S	N/S	S	S	N/S	S	N/S

Table 11 AIN Service Enablers trunk trigger support (Part 2 of 2) (Continued)

Agent	TGT	Trigger (See the notes at the end of this table.)						
		OCPB	ONOA	E_TAT	E_TBSY	S_TBSY	E_TNOA	S_TNOA
Note 1: When the call involves superCAMA LEAS and AIN, operating company personnel must datafill the superCAMA trunk to carry equal access traffic. When the SCP returns a charge number in it's response after triggering, the charge number must also be in table TRKLATA. Furthermore, when the response is to route the call directly to a DN, then operating company personnel must datafill table DNPIC or DNLPIC depending on whether the call is INTER LATA or INTRA LATA. The switch does not support N11 triggering for superCAMA trunks when it is a LEAS trunk. ***Note 2:*** The switch blocks operator verification calls on outgoing CAMA (OC), operator (OP) and operator incoming (OI) trunks from triggering on any of the AIN triggers. In addition, the switch also blocks operator number identification (ONI) calls from triggering on any of the AIN triggers. When an incoming OP, OC, or OI call triggers N11, the switch supports all versions of Analyze_Route responses except the one that directs the call to route to an IXC. ***Note 3:*** The switch supports returning a carrier in the Analyze_Route response after triggering at N11 for the type 2B MF CELL trunks only. ***Note 4:*** Returning a carrier in the Analyze_Route response after triggering at AFR is supported for the type 2B MF CELL trunks only. ***Note 5:*** CDP access code (AC) is supported, CDP intercom/extension (Ext) does not apply to VAPN trunks, the switch does not support CDP feature access code (FAC). ***Note 6:*** An ISUP IT/TI/T2 trunk call with an MBG parameter can encounter a CDP trigger. ***Note 7:*** Office-based subscription only. The switch does not support Individual subscription and group based subscriptions. ***Note 8:*** See Table 1 on page 127 for a description of the symbols used in this table.								

Note: Northern Telecom North America primary rate interface (NTNA PRI) North America PRI variants U449PRI and U459PRI are the only PRI variants that are supported. All other PRI variants are not supported.

The national ISDN-2 primary rate interface (NI-2 PRI) is a variant of the currently supported PRI agent. The AIN restrictions that apply to the NTNA PRI variant also apply to the NI-2 PRI variant and to U449PRI/U459PRI.

Note: Though originating agents are supported, the detection of events depends on the outgoing agents. For interswitch calls, the terminating agents must be ISUP or PRI for the T_No_Answer event, as specified in GR-1298.

The NI-2 PRI agent is supported by the following triggers:

- Off-Hook_Delay
- Customized_Dialing_Plan
- Specified_Carrier

- One_Plus_Prefix
- International
- Operator_Services
- Specific_Digit_String
- Automatic_Flexible_Routing
- Termination_Attempt (while encountering)

4.1 Agent support for triggers O_Called_Party_Busy and O_NoAnswer

The O_Called_Party_Busy trigger supports:

- only terminating ISUP and PRI trunks (see Table 12)
- all terminating lines

Table 12 Terminating trunk agents supported by the O_Called_Party_Busy trigger

Signaling	Trunk Types
ISDN	PRI
SS7	IT, ATC, TO, T2, IBNTO, IBNT2

The O_NoAnswer trigger supports:

- only terminating ISUP trunks, terminating PRI trunks and some terminating PTS trunks (see Table 13)
- all terminating lines

Table 13 Terminating trunk agents supported by the O_NoAnswer trigger

Signaling	Trunk Types
ISDN	PRI
SS7	IT, ATC, TO, T2, IBNTO, IBNT2
PTS	CELL, T2, IT, PX, SC, ATC, IBNT0, IBNT2

Note: When calls originate through public trunk subscription, then it is possible to have duplicate subscription to the O_Called_Party_Busy and the O_NoAnswer triggers.

SS7 public trunks as originators are not supported for the O_Called_Party_Busy and O_NoAnswer triggers. However, the originating call can access these triggers though line subscription.

The O_Called_Party_Busy and the O_NoAnswer triggers support PRI and PBX-MF originating trunks subscription because these are private trunks. Trigger duplicate subscription cannot occur for PRI and PBX-MF trunks because the current implementation of the O_Called_Party_Busy and O_NoAnswer triggers does not allow the originator (at a PBX switch) to subscribe to these triggers through a line subscription.

4.2 Agent support for trigger Specific_Feature_Code

The Specific_Feature_Code trigger supports RES and ISDN BRI agents.

Although the SFC trigger does not support POTS lines, the following tools provide the ability to convert POTS lines to RES lines:

- ADO or NEW commands through SERVORD, which automatically covert POTS lines to RES lines when assigning the AIN option
- the MAKRES tool of MAPCI

The RES_SO_SIMPLIFICATION office parameter enforces the ability to convert POTS lines to RES lines. This parameter must be active to enable automatic POTS to RES line conversion through the SERVORD tool.

Although the SFC trigger does not support POTS 1FR lines, the ability to assign a specific AIN-group to a 1FR line is still allowed. Assignment of the AIN group is independent of the specific trigger that the call may detect in call-processing. So, when a 1FR POTS line with an individually assigned AIN group finds trigger SFC, then runtime subscription checking bypasses the trigger.

4.3 Agent Support for trigger Office Public Feature Code

OFCPFC is subscribed on an office-wide basis. All agents belonging to the office subscribed to the OFCPFC trigger may also subscribe to the OFCPFC trigger. Although the OFCPFC trigger is subscribed on an office wide basis, not all agents belonging to the office will encounter the trigger. Only RES and ISDN BRI agents belonging to a RES group encounter trigger OFCPFC. Trigger OFCPFC is not supported by trunks.

4.3.1 Line Agents Support for trigger OFCPFC

Table 14 Supported Line Agents for trigger OFCPFC

Agent Type	Line Class Code	Encounter OFCPFC Trigger	Subscribe OFCPFC Trigger
POTS - Basic	1FR	NS	S
	1MR	NS	S

Table 14 Supported Line Agents for trigger OFCPFC

Agent Type	Line Class Code	Encounter OFCPFC Trigger	Subscribe OFCPFC Trigger
POTS - PBX	PBX	NS	S
	PBM	NS	S
POTS - Coin	CCF	NS	S
	CDF	NS	S
	CFD	NS	S
	CSP	NS	S
	ZMD	NS	S
	ZMZPA	NS	S
POTS - WATS	2WW	NS	S
	EOW	NS	S
	ETW	NS	S
	INW	NS	S
	OWT	NS	S
POTS - Party	2FR	NS	S
	4FR	NS	S
	8FR	NS	S
	10FR	NS	S
RES - Basic	1FR	S	S
	1MR	S	S
RES - Coin	CCF	S	S
	CDF	S	S
	CFD	S	S
	CSP	S	S
	ZMD	S	S
	ZMZPA	S	S

Table 14 Supported Line Agents for trigger OFCPFC

Agent Type	Line Class Code	Encounter OFCPFC Trigger	Subscribe OFCPFC Trigger
RES - WATS	2WW	S	S
	EOW	S	S
	ETW	S	S
	INW	S	S
	OWT	S	S
IBN - Basic	IBN	NS	S
	M5009	NS	S
	M5112	NS	S
	M5209	NS	S
	M5212	NS	S
	PSET	NS	S
IBN - Other	DATA	NS	S
	PDATA	NS	S
	VLN (for RCF)	NS	S
	ISDNKSET - MFT	NS	S
	ISDNKSET - BRI-NI1/NI2 SET	NS	S
	AC (MDC)	NS	S
IBN - DISA		NS	S
AIN VDN		NS	S

4.3.2 Trunk Agents Support trigger OFCPFC

Table 15 Supported Trunk Agents for O_Disconnect event

Agent Type	Trunk Group Type	Encounter OFCPFC Trigger	Subscribe OFCPFC Trigger
Integrated Business network	IBNT1	NS	NS
	IBNT2	NS	NS

Table 15 Supported Trunk Agents for O_Disconnect event

Agent Type	Trunk Group Type	Encounter OFCPFC Trigger	Subscribe OFCPFC Trigger
Primary Rate Interface	PRI	NS	NS
Inter Toll	IT	NS	NS
Incoming End Office	TI	NS	NS
Two-way End Office	T2	NS	NS
Access to Carrier	ATC	NS	NS
PBX/DID	P2	NS	NS
	PX	NS	NS
Super CAMA	SC	NS	NS
Outgoing CAMA	OC	NS	NS
Cellular 2A (MF)	CELL	NS	NS
Cellular 2A (ISUP)	IUSP IT (CELL 2A Option)	NS	NS
Cellular 1/2B (MF)	PX (LOCAL CMC = Y)	NS	NS
Cellular 1/2B (ISUP)	ISUP IT (CELL 2B Option)	NS	NS
Virtual Access to Private Network	VAPN	NS	NS
Enhanced 911	E911	NS	NS
Operator	OP	NS	NS
Operator Incoming	OI	NS	NS

4.4 Trunk agent support for Prefix triggers - Specified_Carrier, One_Plus_Prefix, International, and Operator_Services

Call processing can detect prefix triggers Specified_Carrier, One_Plus_Prefix, International, and Operator_Services on incoming ISUP, NTNA/NI, and 4ESS/5ESS PRI trunks only.

Trunks ISUP, NTNA/NI PRI, and 4UESS/5UESS PRI provide the messaging parameters that allows the detection of the Prefix triggers.

The following ISUP parameters allow call processing to detect triggers Specified_Carrier, International, and Operator_Services:

- Carrier Selection Information parameter (to detect the Specified_Carrier trigger)
- Nature of Address field of Called Party Number parameter (to detect the International and Operator_Services trigger)

The following PRI SETUP message parameters allow call processing to detect triggers Specified_Carrier, One_Plus_Prefix, International and Operator_Services:

- transit network selector (to detect trigger Specified_Carrier)
- CDN
- type of number and numbering plan (to detect trigger International)
- operator system access information element (to detect trigger Operator_Services)

Call processing cannot detect the Specified_Carrier, One_Plus_Prefix, International and Operator_Services triggers originating on E911 trunks. Call processing cannot detect the One_Plus_Prefix triggers originating on ISUP trunks.

4.5 Agent support for toll-free service

AIN Service Enablers' toll free service supports the same agents as does the AIN Service Enablers' SDS trigger. The agents supported are similar to those supported by TR-533 E800. Specifically, AIN Service Enablers' toll-free service does not support the 8FR/10FR lines and TOPS trunks are supported through looparound trunks.

Although they are supported by AIN, WATS lines and CCF coin lines are not supported by Service Enablers' toll free service.

4.6 Agent support for trigger PRIB

All North American PRI variants support trigger PRIB.

4.7 Agent support for OTS

The screening mechanism introduced by the O_CBP and O_ONoA trigger screening (OTS) feature is supported on the same agents as those supported by O_CPB and O_NoA triggers. Assigning trigger items on a customer group basis is supported for both lines and trunks. However, trunks that have access to O_CPB and O_NoA triggers through a customer group will not query the SCP when O_CPB and O_NoA triggers are hit. Trunks will only query the SCP when they have subscribed themselves to O_CPB and O_NoA triggers.

4.8 Agent support for Create_Call

The calling number in a Create_Call message must be a local line agent. Only line agents supported by AIN can be the originator. The following agents cannot be Create_Call originators:

- ISDN BRI
- coin lines
- attendant consoles
- virtual agents
- party lines

Note 1: Hunt group members are supported, but no hunting is performed.

Note 2: ADSI terminals are supported as analog agents. ADSI service is not provided.

The following tables list the supported line agents for AIN. The information contained in these tables includes the level of support for each agent to be the calling party for Create_Call.

Table 16 POTS support

Type	Line Class Code	Create_Call
Basic	1FR	S
	1MR	S
PBX	PBX	S
	PBM	S
Coin	CCF	N/S
	CDF	N/S
	CFD	N/S
	CSP	N/S
	ZMD	N/S
	ZMZPA	N/S

Table 16 POTS support (Continued)

Type	Line Class Code	Create_Call
WATS	2WW	S
	EOW	S
	ETW	S
	INW	S
	OWT	S
Party	2FR	N/S
	4FR	N/S
	8FR	N/S
	10FR	N/S
Note 1: See Table 1 on page 127 for a description of the symbols used in this table.		

Table 17 RES support

Type	Line Class Code	Create_Call
Basic	1FR	S
	1MR	S
Coin	CCF	N/S
	CDF	N/S
	CFD	N/S
	CSP	N/S
	ZMD	N/S
	ZMZPA	N/S
WATS	2WW	S
	EOW	S
	ETW	S
	INW	S
	OWT	S

Table 17 RES support (Continued)

Type	Line Class Code	Create_Call
Note: See Table 1 on page 127 for a description of the symbols used in this table.		

Table 18 IBN line support

Type	Line Class Code	Create_Call
Basic	IBN	S
	M5009	S
	M5112	S
	M5208	S
	M5209	S
	M5212	S
	M5312	S
	PSET	S
Other	DATA	N/S
	DISA	N/S
	PDATA	N/S
	VLN (for RCF)	N/S
	ISDNKSET-MFT	S
	ISDNKSET-BRI	N/S
	AC	N/S
Note: See Table 1 on page 127 for a description of the symbols used in this table.		

Table 19 DN Line support

Type	Class	Create_Call
DISA	IBN	N/S
AIN VDN	IBN	N/S
	NONIBN	N/S

Table 19 DN Line support (Continued)

Type	Class	Create_Call
Note: See Table 1 on page 127 for a description of the symbols used in this table.		

4.9 Agent support for trigger Term_Resource_Available

Trigger Term_Resource_Available (TRA) is subscribed on a DN basis. Trigger TRA is not applicable on an office wide nor a customer group basis. Trigger TRA cannot be subscribed on trunks.

The following table lists the supported line agents for trigger TRA.

Table 20 Supported Line Agents for trigger TRA

Agent Type	Line Class Code	Encounter TRA Trigger	Subscribe TRA Trigger
POTS - Basic	1FR	S	S
	1MR	S	S
POTS - PBX	PBX	S	S
	PBM	S	S
POTS - Coin	CCF	S	N/A
	CDF	S	N/A
	CFD	S	N/A
	CSP	S	N/A
	ZMD	S	N/A
	ZMZPA	S	N/A
POTS - WATS	2WW	S	N/A
	EOW	S	N/A
	ETW	S	N/A
	INW	S	N/A
	OWT	S	N/A
POTS - Party	2FR	S	NS
	4FR	S	NS

Table 20 Supported Line Agents for trigger TRA

Agent Type	Line Class Code	Encounter TRA Trigger	Subscribe TRA Trigger
	8FR	S	NS
	10FR	S	NS
RES - Basic	1FR	S	S
	1MR	S	S
RES - Coin	CCF	S	S
	CDF	S	S
	CFD	S	S
	CSP	S	S
	ZMD	S	S
	ZMZPA	S	S
RES - WATS	2WW	S	S
	EOW	S	S
	ETW	S	S
	INW	S	S
	OWT	S	S
IBN - Basic	IBN	S	S
	M5009	S	S
	M5112	S	S
	M5209	S	S
	M5212	S	S
	PSET	S	S
IBN - Other	DATA	S	S
	PDATA	S	S
	VLN (for RCF)	S	N/A
	ISDNKSET - MFT	S	S

Table 20 Supported Line Agents for trigger TRA

Agent Type	Line Class Code	Encounter TRA Trigger	Subscribe TRA Trigger
	ISDNKSET - BRI-NI1/NI2 SET	S	S
	AC (MDC)	NS	NS
IBN - DISA		S	NS
AIN VDN		N/A	NS

The following tables list the supported trunk agents for trigger TRA.

Table 21 Supported Trunk Agents for Trigger TRA

Agent Type	Trunk Group Type	Encounter TRA Trigger	Subscribe TRA Trigger
Integrated Business network	IBNT1	S	NS
	IBNT2	S	NS
Primary Rate Interface	PRI	S	NS
Inter Toll	IT	S	NS
Incoming End Office	TI	S	NS
Two-way End Office	T2	S	NS
Access to Carrier	ATC	S	NS
PBX/DID	P2	S	NS
	PX	S	NS
Super CAMA	SC	S	NS
Outgoing CAMA	OC	S	NS
Cellular 2A (MF)	CELL	S	NS
Cellular 2A (ISUP)	IUSP IT (CELL 2A Option)	S	NS
Cellular 1/2B (MF)	PX (LOCAL CMC = Y)	S	NS
Cellular 1/2B (ISUP)	ISUP IT (CELL 2B Option)	S	NS
Virtual Access to Private Network	VAPN	S	NS
Enhanced 911	E911	S	NS
Operator	OP	S	NS

Table 21 Supported Trunk Agents for Trigger TRA

Agent Type	Trunk Group Type	Encounter TRA Trigger	Subscribe TRA Trigger
Operator Incoming	OI	S	NS

4.10 Agent support for CarrierUsage

Agent support for parameter CarrierUsage is based on the following criteria:

- AIN supports the agents.
- The PIC/LPIC feature supports the agents. This support is required so that agent's PIC and LPIC can trigger and can be used for routing (when required) when parameter CarrierUsage is received in an SCP message. Because trunks can be triggering agents, only those trunks that can have a PIC assigned to them are supported. When the call originates on a trunk, CarrierUsage functionality can use the PIC assigned to it (when required) to route the call. Table TRKGRP provides PIC information. Trunks such as PX and P2 trunks can have an Equal Access option assigned to them using the specified PIC. For PRI trunks, table LTCALLS has an option that specifies the PIC for the trunk.
- Because the PIC/LPIC option can also be assigned to a customer group, all customer groups that can have PIC/LPIC assignment are supported.
- Because the PIC/LPIC option can be assigned to the customer group of the trunk, IBNT1 and IBNT2 trunks are supported.
- When unsupported agents of parameter CarrierUsage encounter a PODP trigger with option PODPATRR/LARP assigned, CarrierUsage functionality applies to those agents that are supported by PODPATTR/LARP. Agents supported by the trigger SDS are supported by PODPATTR/LARP.

Note 1: The DMS switch does not support the routing of equal access calls over private trunks after receiving a message containing parameter CarrierUsage.

Note 2: For agents who subscribed to option PIC with value CHOICE set to N (No), when the carrier is selected using the CarrierUsage algorithm, the call routes to DACD treatment. Even though carriers were considered preferred carriers, the SCP provided carriers using the CarrierUsage algorithm that overrode the originator's switch based attributes.

Note 3: Option LCHOICE of the subscriber is verified only when soc EQA00015 is ON. For routing intralata calls a check occurs for option CHOICE.

4.11 Agent support for resource monitoring

The following sections describe agent support for resource monitoring for lines and hunt groups.

4.11.1 Resource monitoring for lines

Table 22 lists supported agents for resource monitoring for lines.

Table 22 Supported agents for resource monitoring for lines

Agent	Type	Line class code
POTS	BASIC	1FR, 1MR
	COIN	CCF, CDF, CFD, CSP, ZMD, ZMZPA
RES	BASIC	1FR, 1MR
	COIN	CCF, CDF, CFD, CSP, ZMD, ZMZPA
	WATS	2WW, EOW, ETW, INW, OWT
IBN	BASIC	IBN, M5009, M5112, M5209, M5212, M5312, PSET
ISDN BRI	BRAMFT, BRAFS (NI1)	ISDNKSET

4.11.2 Resource monitoring for hunt groups

Table 23 lists supported agents for resource monitoring for hunt groups.

Table 23 Supported agents for resource monitoring for hunt groups

Agent			
Class	**Type**	**Line class code**	**Monitor_for_Change (MLH Hunt groups)**
POTS	BASIC	1FR	S
		1MR	S
	PBX	PBX	N/S
		PBM	N/S
	COIN	CCF	N/S
		CDF	N/S
		CFD	N/S
		CSP	N/S
		ZMD	N/S
		ZMZPA	N/S
	WATS	2WW	S
		EOW	S
		ETW	S
		INW	S
		OWT	S
	PARTY	2FR	N/S
		4FR	N/S
		8FR	N/S
		10FR	N/S
Note: See Table 1 on page 127 for a description of the symbols used in this table.			

Table 23 Supported agents for resource monitoring for hunt groups (Continued)

Agent			
Class	**Type**	**Line class code**	**Monitor_for_Change (MLH Hunt groups)**
RES	BASIC	1FR	S
		1MR	S
	COIN	CCF	N/S
		CDF	N/S
		CFD	N/S
		CSP	N/S
		ZMD	N/S
		ZMZPA	N/S
	WATS	2WW	S
		EOW	S
		ETW	S
		INW	S
		OWT	S
Note: See Table 1 on page 127 for a description of the symbols used in this table.			

Table 23 Supported agents for resource monitoring for hunt groups (Continued)

Agent			
Class	**Type**	**Line class code**	**Monitor_for_Change (MLH Hunt groups)**
IBN	BASIC	IBN	S
		M5008	S
		M5009	S
		M5112	S
		M5209	S
		M5212	S
		M5216	S
		M5312	S
		M5316	S
		PSET	S
		Display_PPhone	S
	OTHER	DATA	N/S
		PDATA	N/S
		VLN (for RCF)	N/A
		ISDNKSET-MFT	N/S
		ISDNKSET-BRI	S
		AC	N/S
Note: See Table 1 on page 127 for a description of the symbols used in this table.			

4.12 Agent support for TKTERM trigger

Table 25 lists agent support for trunk group trigger functionality.

Table 24 Agent support for TKTERM trigger

Agent type	Trunk Group Type	Encounter Trunk Group trigger	Subscribe TKTERM Trigger
Integrated Business Network	IBNTO	S	S
Integrated Business Network	IBNT2	S	S
Integrated Business Network (see Note 2)	IBNTI	S	N/S
Primary Rate Interface	PRI	S	S
InterToll	IT	S	S
Outgoing End Office	TO	S	S
Two-Way End Office	T2	S	S
Incoming End Office (see Note 2)	TI	S	N/S
Access To Carrier	ATC	S	S
PBX/DID	P2	S	S
PBX/DID	PX	S	S
SuperCAMA	SC	S	NS
OutgoingCAMA	OC	S	NS
Cellular 2A(MF)	CELL	S	S
Cellular 2A(ISUP)	ISUP IT CELL 2A option	UU	UU
Cellular 1/2B(MF)	PX (LOCAL CMC = Y)	UU	UU
Cellular 1/2B(ISUP)	ISUP IT (CELL 2B Option)	UU	UU

Note 1: These trunks are not supported for any AIN.

Note 2: All Emergency / Operator will not be able to subscribe to the Trunk Group Trigger, since these are used for Emergency Services. Trunk Group Trigger is defined for the terminating Call Model, therefore can exist only on the Outgoing Trunks. All trunk groups not listed are untested/unsupported.

Note 3: Currently DPT and SIPT trunks are not tested.

Table 24 Agent support for TKTERM trigger

Agent type	Trunk Group Type	Encounter Trunk Group trigger	Subscribe TKTERM Trigger
Virtual Access to Private Network (see Note 1)	VAPN	S	NS
Enhanced 911 (see Note 2)	E911	S	NS
Operator (see Note 2)	OP	S	NS
Operator Incoming (see Note 2)	OI	S	NS
ISUP+(DPT)	DPT	UU	UU
ISUP+(SIPT)	SIPT	UU	UU

Note 1: These trunks are not supported for any AIN.

Note 2: All Emergency / Operator will not be able to subscribe to the Trunk Group Trigger, since these are used for Emergency Services. Trunk Group Trigger is defined for the terminating Call Model, therefore can exist only on the Outgoing Trunks. All trunk groups not listed are untested/unsupported.

Note 3: Currently DPT and SIPT trunks are not tested.

4.13 Agent support for Update message waiting indicator

Table 25 lists agent support for Update message waiting indicator (MWI) functionality.

Table 25 Agent support for Update MWI

Agent			
Class	**Type**	**Line class code**	**Update**
POTS	BASIC	1FR	S
		1MR	S
	PBX	PBX	N/S
		PBM	N/S
	COIN	CCF	N/S
		CDF	N/S
		CFD	N/S
		CSP	N/S
		ZMD	N/S
		ZMZPA	N/S
	WATS	2WW	N/S
		EOW	N/S
		ETW	N/S
		INW	N/S
		OWT	N/S
	PARTY	2FR	N/S
		4FR	N/S
		8FR	N/S
		10FR	N/S
Note: See Table 1 on page 127 for a description of the symbols used in this table.			

Table 25 Agent support for Update MWI

Agent			
Class	**Type**	**Line class code**	**Update**
RES	BASIC	1FR	S
		1MR	S
	COIN	CCF	N/S
		CDF	N/S
		CFD	N/S
		CSP	N/S
		ZMD	N/S
		ZMZPA	N/S
	WATS	2WW	N/S
		EOW	N/S
		ETW	N/S
		INW	N/S
		OWT	N/S
IBN	BASIC	IBN	S
		M5009	S
		M5112	S
		M5209	S
		M5212	S
		M5312	S
		PSET	S
	OTHER	DATA	N/S
		PDATA	N/S
		VLN (for RCF)	N/S
		ISDNKSET-MFT	S
		ISDNKSET-BRI	S
		AC	N/S
Note: See Table 1 on page 127 for a description of the symbols used in this table.			

4.14 Agent Support for O_Disconnect and O_Disconnect_Called Events

Table 26 Legend for agent support

Definition	Meaning
Arm O_Disconnect Event	O_Disconnect event can be armed when the specified agent is the triggering agent.
Detect O_Disconnect Event	O_Disconnect event can be detected when the specified originating agent disconnects from an active call in which O_Disconnect event is armed.
Arm O_Disconnect_Called Event	O_Disconnect_Called event can be armed when the specified agent is the triggering agent.
Detect O_Disconnect Event	O_Disconnect_Called event can be detected when the specified agent disconnects from an active call in which O_Disconnect_Called event is armed.

- For supported Line Agents for O_Disconnect refer to 4.14.1
- For supported Trunk Agents for O_Disconnect refer to 4.14.2
- For supported Line Agents for O_Disconnect_Called refer to 4.14.3
- For supported Trunk Agents for O_Disconnect_Called refer to 4.14.4

4.14.1 Line Agents Support for O_Disconnect event

Table 27 Supported Line Agents for O-Disconnect event

Agent Type	Line Class Code	Arm O_Disconnect event	Detect O_Disconnect event
POTS - Basic	1FR	S	S
	1MR	S	S
POTS - PBX	PBX	S	S
	PBM	S	S
POTS - Coin	CCF	S	S
	CDF	S	S

Table 27 Supported Line Agents for O-Disconnect event

Agent Type	Line Class Code	Arm O_Disconnect event	Detect O_Disconnect event
	CFD	S	S
	CSP	S	S
	ZMD	S	S
	ZMZPA	S	S
POTS - WATS	2WW	NS	NS
	EOW	NS	NS
	ETW	NS	NS
	INW	NS	NS
	OWT	NS	NS
POTS - Party	2FR	S	S
	4FR	S	S
	8FR	NS	NS
	10FR	NS	NS
RES - Basic	1FR	S	S
	1MR	S	S
RES - Coin	CCF	S	S
	CDF	S	S
	CFD	S	S
	CSP	S	S
	ZMD	S	S
	ZMZPA	S	S
RES - WATS	2WW	S	S
	EOW	S	S
	ETW	S	S
	INW	S	S

Table 27 Supported Line Agents for O-Disconnect event

Agent Type	Line Class Code	Arm O_Disconnect event	Detect O_Disconnect event
	OWT	S	S
IBN - Basic	IBN	S	S
	M5009	S	S
	M5112	S	S
	M5209	S	S
	M5212	S	S
	PSET	S	S
IBN - Other	DATA	S	S
	PDATA	S	S
	VLN (for RCF)	NS	NS
	ISDNKSET - MFT	S	S
	ISDNKSET - BRI-NI1/NI2 SET	S	S
	AC (MDC)	NS	NS
IBN - DISA		NS	NS
AIN VDN		NS	NS

4.14.2 Trunk Agents Support for O_Disconnect event

Table 28 Supported Trunk Agents for O_Disconnect event

Agent Type	Trunk Group Type	Arm O_Disconnect event	Detect O_Disconnect event
Integrated Business network	IBNT1	S	S
	IBNT2	S	S
Primary Rate Interface	PRI	S	S
Inter Toll	IT	S	S
Incoming End Office	TI	S	S

Table 28 Supported Trunk Agents for O_Disconnect event

Agent Type	Trunk Group Type	Arm O_Disconnect event	Detect O_Disconnect event
Two-way End Office	T2	S	S
Access to Carrier	ATC	S	S
PBX/DID	P2	S	S
	PX	S	S
Super CAMA	SC	NS	NS
Outgoing CAMA	OC	NS	NS
Cellular 2A (MF)	CELL	S	S
Cellular 2A (ISUP)	IUSP IT (CELL 2A Option)	S	S
Cellular 1/2B (MF)	PX (LOCAL CMC = Y)	S	S
Cellular 1/2B (ISUP)	ISUP IT (CELL 2B Option)	S	S
Virtual Access to Private Network	VAPN	S	S
Enhanced 911	E911	NS	NS
Operator	OP	NS	NS
Operator Incoming	OI	NS	NS

4.14.3 Line Agents Support for O_Disconnect_Called event

Table 29 Supported Line Agents for O-Disconnect_Called event

Agent Type	Line Class Code	Arm O_Disconnect_Called event	Detect O_Disconnect_Called event
POTS - Basic	1FR	S	S
	1MR	S	S
POTS - PBX	PBX	S	S
	PBM	S	S
POTS - Coin	CCF	S	S
	CDF	S	S

Table 29 Supported Line Agents for O-Disconnect_Called event

Agent Type	Line Class Code	Arm O_Disconnect_Called event	Detect O_Disconnect_Called event
	CFD	S	S
	CSP	S	S
	ZMD	S	S
	ZMZPA	S	S
POTS - WATS	2WW	NS	NS
	EOW	NS	NS
	ETW	NS	NS
	INW	NS	NS
	OWT	NS	NS
POTS - Party	2FR	S	S
	4FR	S	S
	8FR	NS	NS
	10FR	NS	NS
RES - Basic	1FR	S	S
	1MR	S	S
RES - Coin	CCF	S	S
	CDF	S	S
	CFD	S	S
	CSP	S	S
	ZMD	S	S
	ZMZPA	S	S
RES - WATS	2WW	S	S
	EOW	S	S
	ETW	S	S
	INW	S	S

Table 29 Supported Line Agents for O-Disconnect_Called event

Agent Type	Line Class Code	Arm O_Disconnect_Called event	Detect O_Disconnect_Called event
	OWT	S	S
IBN - Basic	IBN	S	S
	M5009	S	S
	M5112	S	S
	M5209	S	S
	M5212	S	S
	PSET	S	S
IBN - Other	DATA	S	S
	PDATA	S	S
	VLN (for RCF)	NS	NS
	ISDNKSET - MFT	S	S
	ISDNKSET - BRI-NI1/NI2 SET	S	S
	AC (MDC)	NS	NS
IBN - DISA		S	NS
AIN VDN		S	NS

4.14.4 Trunk Agents Support for O_Disconnect_Called event

Table 30 Supported Trunk Agents for O_Disconnect_Called event

Agent Type	Trunk Group Type	Arm O_Disconnect_Called event	Detect O_Disconnect_Called event
Integrated Business network	IBNT1	S	S
	IBNT2	S	S
Primary Rate Interface	PRI	S	S
Inter Toll	IT	S	S

Table 30 Supported Trunk Agents for O_Disconnect_Called event

Agent Type	Trunk Group Type	Arm O_Disconnect_Called event	Detect O_Disconnect_Called event
Incoming End Office	TI	S	NS
Two-way End Office	T2	S	S
Access to Carrier	ATC	S	S
PBX/DID	P2	S	NS
	PX	S	NS
Super CAMA	SC	NS	NS
Outgoing CAMA	OC	NS	NS
Cellular 2A (MF)	CELL	S	S
Cellular 2A (ISUP)	IUSP IT (CELL 2A Option)	S	S
Cellular 1/2B (MF)	PX (LOCAL CMC = Y)	S	NS
Cellular 1/2B (ISUP)	ISUP IT (CELL 2B Option)	S	S
Virtual Access to Private Network	VAPN	S	S
Enhanced 911	E911	NS	NS
Operator	OP	NS	NS
Operator Incoming	OI	NS	NS

4.15 Agent Support for Timeout Event

- For supported Line Agents for Timeout refer to 4.15.1
- For supported Trunk Agents for Timeout refer to 4.15.2

4.15.1 Line Agents Support for Timeout event

Table 31 Supported Line Agents for Timeout event

Agent Type	Line Class Code	Arm Timeout event	Detect Timeout event
POTS - Basic	1FR	S	S

Table 31 Supported Line Agents for Timeout event

Agent Type	Line Class Code	Arm Timeout event	Detect Timeout event
	1MR	S	S
POTS - PBX	PBX	S	S
	PBM	S	S
POTS - Coin	CCF	S	S
	CDF	S	S
	CFD	S	S
	CSP	S	S
	ZMD	S	S
	ZMZPA	S	S
POTS - WATS	2WW	NS	NS
	EOW	NS	NS
	ETW	NS	NS
	INW	NS	NS
	OWT	NS	NS
POTS - Party	2FR	S	S
	4FR	S	S
	8FR	NS	NS
	10FR	NS	NS
RES - Basic	1FR	S	S
	1MR	S	S
RES - Coin	CCF	S	S
	CDF	S	S
	CFD	S	S
	CSP	S	S
	ZMD	S	S
	ZMZPA	S	S

Table 31 Supported Line Agents for Timeout event

Agent Type	Line Class Code	Arm Timeout event	Detect Timeout event
RES - WATS	2WW	S	S
	EOW	S	S
	ETW	S	S
	INW	S	S
	OWT	S	S
IBN - Basic	IBN	S	S
	M5009	S	S
	M5112	S	S
	M5209	S	S
	M5212	S	S
	PSET	S	S
IBN - Other	DATA	S	S
	PDATA	S	S
	VLN (for RCF)	NS	NS
	ISDNKSET - MFT	S	S
	ISDNKSET - BRI-NI1/NI2 SET	S	S
	AC (MDC)	NS	NS
IBN - DISA		S	S
AIN VDN		S	S

4.15.2 Trunk Agents Support for Timeout event

Table 32 Supported Trunk Agents for Timeout event

Agent Type	Trunk Group Type	Arm Timeout event	Detect Timeout event
Integrated Business network	IBNT1	S	S
	IBNT2	S	S

Table 32 Supported Trunk Agents for Timeout event

Agent Type	Trunk Group Type	Arm Timeout event	Detect Timeout event
Primary Rate Interface	PRI	S	S
Inter Toll	IT	S	S
Incoming End Office	TI	S	S
Two-way End Office	T2	S	S
Access to Carrier	ATC	S	S
PBX/DID	P2	S	S
	PX	S	S
Super CAMA	SC	NS	NS
Outgoing CAMA	OC	NS	NS
Cellular 2A (MF)	CELL	S	S
Cellular 2A (ISUP)	IUSP IT (CELL 2A Option)	S	S
Cellular 1/2B (MF)	PX (LOCAL CMC = Y)	S	S
Cellular 1/2B (ISUP)	ISUP IT (CELL 2B Option)	S	S
Virtual Access to Private Network	VAPN	S	S
Enhanced 911	E911	S	S
Operator	OP	NS	NS
Operator Incoming	OI	NS	NS

4.16 Agent Support for Carrier Support for Send To Resource, and STR Response Translation Events

- For supported Line Agents refer to 4.16.1
- For supported Trunk Agents refer to 4.16.2

4.16.1 Line Agents Support for STR Carrier and Translation events

Table 33 Supported Line Agents for STR Carrier and Translation events

Agent Type	Line Class Code	Arm Events	Detect Events
POTS - Basic	1FR	S	S
	1MR	S	S
POTS - PBX	PBX	S	S
	PBM	S	S
POTS - Coin	CCF	S	S
	CDF	S	S
	CFD	S	S
	CSP	S	S
	ZMD	S	S
	ZMZPA	S	S
POTS - WATS	2WW	S	S
	EOW	S	S
	ETW	S	S
	INW	S	S
	OWT	S	S
POTS - Party	2FR	S	S
	4FR	S	S
	8FR	NS	NS
	10FR	NS	NS
RES - Basic	1FR	S	S
	1MR	S	S
RES - Coin	CCF	S	S
	CDF	S	S
	CFD	S	S

Table 33 Supported Line Agents for STR Carrier and Translation events

Agent Type	Line Class Code	Arm Events	Detect Events
	CSP	S	S
	ZMD	S	S
	ZMZPA	S	S
RES - WATS	2WW	S	S
	EOW	S	S
	ETW	S	S
	INW	S	S
	OWT	S	S
IBN - Basic	IBN	S	S
	M5009	S	S
	M5112	S	S
	M5209	S	S
	M5212	S	S
	PSET	S	S
IBN - Other	DATA	S	S
	PDATA	S	S
	VLN (for RCF)	NS	NS
	ISDNKSET - MFT	S	S
	ISDNKSET - BRI-NI1/NI2 SET	S	S
	AC (MDC)	NS	NS
IBN - DISA		S	S
AIN VDN		S	S

4.16.2 Trunk Agents Support for STR Carrier and Translation events

Table 34 Supported Trunk Agents for STR Carrier and Translation events

Agent Type	Trunk Group Type	Arm Events	Detect Events
Integrated Business network	IBNT1	S	S
	IBNT2	S	S
Primary Rate Interface	PRI	S	S
Inter Toll	IT	S	S
Incoming End Office	TI	S	S
Two-way End Office	T2	S	S
Access to Carrier	ATC	S	S
PBX/DID	P2	S	S
	PX	S	S
Super CAMA	SC	S	S
Outgoing CAMA	OC	NS	NS
Cellular 2A (MF)	CELL	NS	NS
Cellular 2A (ISUP)	IUSP IT (CELL 2A Option)	S	S
Cellular 1/2B (MF)	PX (LOCAL CMC = Y)	NS	NS
Cellular 1/2B (ISUP)	ISUP IT (CELL 2B Option)	S	S
Virtual Access to Private Network	VAPN	NS	NS
Enhanced 911	E911	NS	NS
Operator	OP	NS	NS
Operator Incoming	OI	NS	NS

4.17 Agent Support for Connect To Resource message processing

The AIN/CPH controller is the agent that initiated the CPH call and has LegId 0. The controller is connected to the resource when the agent type is supported and the CTR message has a LegID of 0 or none. When the LegID in CTR message is 1 or 2, the resource is connected to that agent.

- For supported Line Agents refer to 4.17.1
- For supported Trunk Agents refer to 4.17.2

4.17.1 Line Agents Support for CTR

Table 35 Supported Line Agents for CTR

Agent Type	Line Class Code	CPH Controller
POTS - Basic	1FR	S
	1MR	S
POTS - PBX	PBX	S
	PBM	S
POTS - Coin	CCF	S
	CDF	S
	CFD	S
	CSP	S
	ZMD	S
	ZMZPA	S
POTS - WATS	2WW	NS
	EOW	NS
	ETW	NS
	INW	NS
	OWT	NS
POTS - Party	2FR	S
	4FR	S
	8FR	NS
	10FR	NS
RES - Basic	1FR	S
	1MR	S
RES - Coin	CCF	S
	CDF	S
	CFD	S

Table 35 Supported Line Agents for CTR

Agent Type	Line Class Code	CPH Controller
	CSP	S
	ZMD	S
	ZMZPA	S
RES - WATS	2WW	S
	EOW	S
	ETW	S
	INW	S
	OWT	S
IBN - Basic	IBN	S
	M5009	S
	M5112	S
	M5209	S
	M5212	S
	PSET	S
IBN - Other	DATA	S
	PDATA	S
	VLN (for RCF)	NS
	ISDNKSET - MFT	S
	ISDNKSET - BRI-NI1/NI2 SET	S
	AC (MDC)	NS
IBN - DISA		S
AIN VDN		S

4.17.2 Trunk Agents Support for CTR

Table 36 Supported Trunk Agents for CTR

Agent Type	Trunk Group Type	CPH Controller
Integrated Business network	IBNT1	S
	IBNT2	S
Primary Rate Interface	PRI	S
Inter Toll	IT	S
Incoming End Office	TI	S
Two-way End Office	T2	S
Access to Carrier	ATC	S
PBX/DID	P2	S
	PX	S
Super CAMA	SC	NS
Outgoing CAMA	OC	NS
Cellular 2A (MF)	CELL	S
Cellular 2A (ISUP)	IUSP IT (CELL 2A Option)	S
Cellular 1/2B (MF)	PX (LOCAL CMC = Y)	S
Cellular 1/2B (ISUP)	ISUP IT (CELL 2B Option)	S
Virtual Access to Private Network	VAPN	S
Enhanced 911	E911	S
Operator	OP	NS
Operator Incoming	OI	NS

Part II Functional description

Part II: “Functional description” consists of the following chapters:

Chapter 5:“Functional overview”

Chapter 6:“Generic SSP procedures”

Chapter 7:“Originating call model triggers”

Chapter 8:“Originating call model events”

Chapter 9:“Terminating call model triggers”

Chapter 10:“Terminating call model events”

Chapter 17:“Connect_To_Resource”

Chapter 11:“Participant interactions”

Chapter 12:“Generic SCP-SSP interactions for Send_To_Resource”

Chapter 13:“Generic SSP-IP interactions for Send_To_Resource”

Chapter 14:“STR processing with an SSP resource”

Chapter 15:“STR connection to a local IP”

Chapter 16:“STR connection to a remote IP”

Chapter 18:“Toll-free service”

Chapter 19:“Error handling”

Chapter 20:“Limitations”

5 Functional overview

AIN Service Enablers provides the customer with the following functionality:

- functionality that is upwards compatible with AIN Essentials
- support for next event lists (NELs) and events listed in Table 1 on page 118 and Table 2 on page 123
- Multiple extended TCAP transactions in OCM functionality
- support for the triggers listed in Table 3 on page 115
- Carrier Usage parameter processing
- digit string escape codes for triggers
- Send_To_Resource (STR) processing using an external intelligent peripheral (IP) — (local and remote)
- toll-free service (TFS) using AIN Service Enablers (GR-2892)
- network traffic management
- support for the encoding and decoding of the AIN Service Enablers message set, including introduced message parameters and upgrades to existing message parameters
- logs and billing records that are specific to AIN Service Enablers
- upgraded tools for the Service Enablers message set
  - — AINTrace
  - — TRAVER
- operational measurements (OMs)
- query tool functionality including QLEN, QDN, and QLT
- control of software option AIN DCR Interworking
- AIN DCR Interworking (Canadian market only)
  - — DCR handicap removal
  - — TRAVER support for AIN DCR Interworking

— AFR trigger and Netbusy EDP-R interworking with DCR

— DCR route selector for AIN response processing

- Create_Call functionality

An AIN Service Enablers trigger must occur before using NEL or Send_To_Resource (STR) messages to an intelligent peripheral.

5.1 Use of AIN Essentials functionality

AIN Essentials was the first AIN SSP product to implement the basic AIN call model.

AIN Service Enablers enhances the basic call model to include more complex capabilities (for example, event detection and interaction with Intelligent Peripherals). It requires AIN Essentials as a prerequisite and is being rolled out over a number of software releases, beginning with NA007.

Note: New and upgraded message parameters that are available through SOC option AIN00220 apply to both AIN Service Enablers messages and AIN Essentials messages.

AIN Service Enablers supports the trigger equivalence to the AIN Essentials program. This support includes equivalence to the following AIN Essential functionality:

- default routing
- trigger criteria checking

5.1.1 Default routing

The software provides default routing for the SSP return on error, T1 timer expiry messages, and ACG gapped calls. SOC option AIN00010 controls this functionality. See Chapter 11:“Software optionality control” for details.

Note: The AIN00010 does not have any impact, if the R02 message set (AIN 0.2) is used.

Operating company personnel can apply default routing to triggers SDS, N11, Specified_Carrier, One_Plus_Prefix, International, Operator_Services, and Termination_Attempt. Whether or not a trigger subscribes to default routing, when the call encounters either of the two errors that would invoke default routing, the software applies AIN Final Treatment.

Operating company personnel can subscribe default routing on a per trigger basis through the trigger group provisioned data model (table TRIGDIG and TRIGINFO), or TRIGGER item provisioning data model (table TRIGITM).

For more information about default routing, see the provisioning sections of this document.

Default routing does not apply to EDP-R queries. Default routing does not take place when either of the following situations occurs:

- when the T1 timer expires after sending an EDP-R query
- when any the system encounters an application error or network error while attempting to send an EDP-R query
- EXTENDED TRANSACTIONS: For an O_NoAnswer EDP-R or TDP-R, call processing continues to alert the called party. For an O_Called_Party_Busy and Network_Busy EDP-R, the software applies the appropriate treatment to the originator. Examples of appropriate treatment are busy or call rejection.

The software does not support default routing for triggers T_Busy and T_NoAnswer. For T_Busy TDP-R, the appropriate treatment is (such as busy or call rejection) is applied to the originator. For T_NoA TDP-R, call processing continues to alert the called party.

5.1.2 Triggering criteria checking

AIN Service Enablers supports trigger criteria equivalent to AIN Essentials.

For datafill examples when using digit criteria, see Section 12.2 “Parameters with adequate default values”.

The serial trigger count on a call is the sum of AIN Essentials triggers, AIN Service Enablers triggers, and AIN Service Enablers events.

5.2 Events and next event list support

Table 1 on page 118 and Table 2 on page 123 list the supported events. Chapter 8:“Originating call model events” and Chapter 10:“Terminating call model events” describe the events in detail.

5.2.1 Next event lists

A next event list (NEL) is a list of requested events for an open transaction that operating company personnel maintain at the SSP. The service control point (SCP) or adjunct requests these events using the Request_Report_BCM_Event message.

For details on next event lists and the Request_Report_BCM_Event message, see Section 6.2.1 “Event support” on page 197 and Section 6.6.12 “Request_Report_BCM_Event message and processing” on page 290.

5.2.2 Multiple extended TCAP transactions in OCM

Multiple extended TCAP transactions (METT) related to the same originating call half can remain open at the same time. Events related to different transactions can remain armed simultaneously. For more information, refer to Chapter 8:“Originating call model events”.

Note: Multiple extended TCAP transactions (METT) in OCM functionality does not change the way that switched-based features work with NELs.

5.3 Trigger support

This guide lists the supported triggers in Table 1 on page 118 and Table 3 on page 115. Complete descriptions are in Chapter 7:“Originating call model triggers” and Chapter 9:“Terminating call model triggers”.

There are changes to AIN trigger criteria checking to handle the encountering of triggers during an open transaction due to a NEL or STR message to an intelligent peripheral.

Transactions handled by AIN Service Enablers follow:

- non-persistent transaction: a transaction consisting of a single query and response
- persistent transaction: a transaction that includes conversation in addition to a query and response message pair

The presence of NELs implies a different class of transaction, the extended transaction. An extended transaction is a persistent transaction that has an active NEL.

Feedback from several operating companies indicates that it is desirable to trigger during an extended transaction for Local Number Portability (LNP) and AIN Essentials. This is contrary to global requirements [4] and [6] in GR-1298-CORE. This operating company requirement is mandatory for AIN Service Enablers to interact correctly with LNP.

The DMS-100 SSP allows triggering in the same call model as an extended transaction.

For details concerning the triggering requirements during Send_To_Resource (STR) messages, see Chapter 11:“Participant interactions” to Chapter 16:“STR connection to a remote IP”

5.3.1 Trigger Term_Resource_Available

Trigger Term_Resource_Available (TRA) is enabled through datafill on the SSP. Trigger TRA is detected at the TRA trigger detection point (TDP) at the

exit of the Select Facility PIC when the terminating access is not busy. When the trigger is detected, a query is launched to the SCP requesting additional instructions for processing the call. The SSP intercepts the audible ring indication gets sent to the originating call half and sends a TRA trigger query to the SCP. Based on the valid response received from the SCP, the call either terminates on the called DN or forwards to another DN.

For more information about trigger TRA, see Chapter 38:“Term_Resource_Available trigger”.

5.4 Send_To_Resource message

The Send_To_Resource (STR) message instructs the SSP to play an announcement or send a tone to the originating party and, optionally, collect digits. The system receives the STR message in either a response or a conversation package.

The system supports the following forms of user interactions:

- When the SCP receives new messages, they indicate either call information to resource or call information from resource.
- When the SSP receives an STR message in a response package, the SSP sends a tone or plays an announcement to completion and disconnects the call.
- When the SSP receives an STR message in a conversation package, the SSP sends a tone or plays an announcement and optionally collect digits.
- When an STR message includes the DestinationAddress that is the DN of an intelligent peripheral, the SSP establishes a connection with the intelligent peripheral.
- When the system receives an STR message for a leg of 3WC and requires SSP digit translation, translation uses the data of the controlling party.

After an STR-connection links to the intelligent peripheral, the SCP and the intelligent peripheral can exchange information through the SSP using the Call_Info_From_Resource and Call_Info_To_Resource messages.

AIN Service Enablers introduces the intelligent peripheral to the AIN configuration as specified by GR-1129-CORE, *AINGR: Switch—Intelligent Peripheral Interface (IPI) Generic Requirements,* Issue 2, Bellcore, July 1996.

Figure 3 on page 186 provides a block diagram of the AIN Service Enablers configuration.

When the intelligent peripheral is local to the SSP, interactions with the intelligent peripheral use the integrated services digital network (ISDN) primary rate interface (PRI). For example, when the STR message to SSP 2

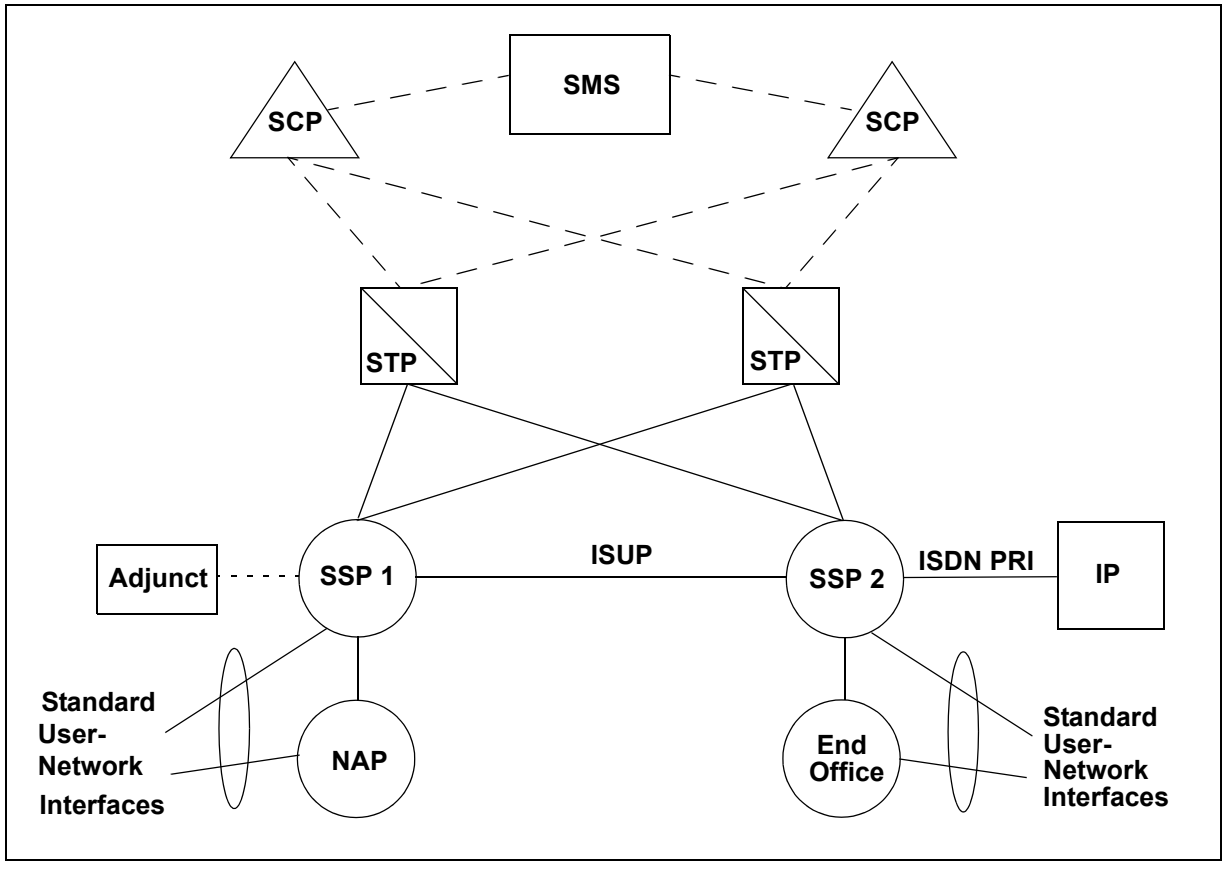
contained the DN for the intelligent peripheral, SSP 2 would use an ISDN PRI to interact with the intelligent peripheral.

When the intelligent peripheral is not local to the SSP, interactions to the intelligent peripheral use an ISUP connection between intermediate SSPs. For example, when the STR message to SSP 1 contained the DN for the intelligent peripheral, SSP 1would establish and use an ISUP connection to SSP 2, which has a direct link to the intelligent peripheral.

An SSP can be physically connected to several intelligent peripherals, and one intelligent peripheral can be physically connected to several SSPs. (For each call, the SSP interacts with just a single intelligent peripheral.)

This guide describes STR and interactions with an intelligent peripheral in Chapter 11: “Participant interactions” on page 479 to Chapter 16: “STR connection to a remote IP” on page 577

Figure 3 Advanced intelligent network Service Enablers configuration



5.5 Connect_To_Resource message

The Connect_To_Resource (CTR) message instructs the SSP to play an announcement or send a tone to the originating party and, optionally, collect digits. The system receives the CTR message in either a response or a conversation package. The CTR message is similar in functionality to the STR message, the difference being where in a call it occurs. The CTR is limited to internal resources.

The system supports the following forms of user interactions:

- When the SCP receives new messages, they indicate either call information to resource or call information from resource.
- When the SSP receives an CTR message in a response package, the SSP sends a tone or plays an announcement to completion and disconnects the call.
- When the SSP receives an CTR message in a conversation package, the SSP sends a tone or plays an announcement and optionally collect digits

5.6 Toll-free service

Service Enablers' toll-free service implements the requirements of *GR-2892-CORE, Switching and Signaling Generic Requirements for Toll-Free Service using Advanced Intelligent Network*, Issue 1, Bellcore, April 1995. This document identifies the subset of AIN 0.2 SSP functions and how they are combined to provide toll-free service. See Chapter 18: "Toll-free service" on page 629.

5.7 Dynamically controlled routing with AIN

Note: This functionality applies to the Canadian market only.

The dynamically controlled routing (DCR) feature actively routes overflow traffic, separated by one or two links, from an originating switch. Each switch of the DCR network provides traffic congestion data to a centralized processor [network processor (NP)] that describes the resource usage of the switch. The NP uses this data to calculate alternate routing recommendations for calls that overflow their direct route. The NP provides the switches with these recommendations.

5.7.1 Support for DCR handicap removal

The SSP removes the DCR handicap for calls redirected or retranslated by AIN when an Analyze_Route, a Forward_Call, or a Collect_Info response occurs. Because of this handicap removal, calls incoming on a DCR trunk are considered as first offered calls (that is, a new DCR call). When the SSP removes the DCR handicap and the call is considered a new DCR call, the call

can use DCR direct routes, direct tandem routes (when applicable), and exception routes (whether SLER is ON or OFF).

When the SSP receives a Continue, an Offer_Call, an Authorize_Termination, or a Disconnect message in response to any valid TDP-R or EDP-R query, the SSP does not remove the DCR handicap on the call incoming on a DCR trunk.

5.7.1.1 Handicap removal for STR-IP conversation message

When the SSP receives a Send_To_Resource to an external resource, the SSP removes the DCR handicap. When the SSP receives a Send_To_Resource to an internal resource, the SSP does not remove the DCR handicap.

When a Continue, an Authorize_Termination, or an Offer_Call response, with an intermediate Send_To_Resource to an external resource occurs, the SSP removes the DCR handicap during STR processing. This handicap removal routes the call to an external resource (IP). When a Continue, an Authorize_Termination, or an Offer_Call response, without an intermediate Send_To_Resource to an external resource occurs, the SSP does not remove the DCR handicap.

5.7.2 TRAVER support for AIN DCR interworking

The NA013 product release enhances TRAVER to support AIN DCR interworking.

5.7.2.1 TRAVER support for AIN response translations

The SSP removes the DCR handicap when an Analyze_Route, a Forward_Call, a Collect_Info, or a Send_To_Resource message is received in response to a trigger or EDP-R. Because of this handicap removal, calls incoming on a DCR trunk are considered as first offered calls (that is, a new DCR call). When the SSP removes the DCR handicap and the call is considered a new DCR call, the output for the AIN response translations TRAVER lists the DCR direct routes, the recommended tandem routes (when applicable), and the exception routes (whether SLER is ON or OFF).

5.7.2.2 Traver support for DCR AFR trigger interworking

When a DCR call traverses through DCR routes and the call encounters an automatic flexible route (AFR) pattern, TRAVER displays this traverse in both the TRACE and NOTRACE portion.

5.7.3 Support for AFR trigger/Netbusy EDP-R interworking with DCR

A Netbusy EDP-R occurs when DCR blocks the call and a NETBUSY NEL is armed.

Datafill the AFR trigger at the end of the DCR exception routes so that the call hits the AFR trigger when all DCR routes are busy DCR routes include direct, recommended tandem (when applicable), and exception routes. Operating

company personnel can specify AFR at any location in the route list. When the SSP encounters AFR in the route list, AFR trigger processing begins. The SSP ignores route list entries that follow AFR.

5.7.4 Support for DCR route selector for AIN response processing

AIN response processing (AIN response translations and AIN response routing) supports DCR selectors, DCRT and NODE. AIN response routing includes routing using Primary_Trunk_Group, Alternate_Trunk_Group, and Second_Alternate_Trunk_Group parameters. DCRT and NODE selectors point to table DESTNODE for routing. The DESTNODE tuple can have an 'S' selector, or a 'T' selector that index to other tables, or 'NIL' indicating no routes. When a 'T' selector indexes to other tables, the route list of the indexed tuple is verified for AIN non-supported selectors.

5.8 Create_Call

This activity allows the SCP to request that the SSP create a connection between a calling party and a called party. The Create_Call message is an SCP event message. The SSP has no knowledge of this request.

The Create_Call message comes in a query package from the SCP, and can have one or more of the following messages:

- request report BCM event (RRBCME)

  Note: See Chapter 20: "Limitations" on page 671.

- send notification
- automatic code gapping (ACG)

Parameters CallingPartyID and CalledPartyID must be present in the Create_Call message. The originator identified by the CallingPartyID must reside on the SSP that receives the Create_Call message. The terminator of the call can be within the same SSP or can be outside of the SSP.

The switch uses AIN response translations to set up the call between the calling party and the called parties.

5.8.1 Application

This feature allows the SCP to create a call based on SSP service logic. The calling party can hit triggers starting at trigger detection point (TDP) 4 and up. When the Create_Call message sets up the call, the originator ignores TDPs 1 and 3.

5.8.2 Limitations

The following limitations apply to this activity:

- The RRBCME message is not processed when it comes with the Create_Call message.
- This feature does not support originators that are ISDN BRI, attendant console, coin lines, data units, party lines, ACD, UCD, and DISA.
- Analog display service interface (ADSI) phones are treated like analog phones. This feature does not support enhancements to ADSI signaling support agents.
- This activity does not support the following optional parameters in a Create_Call message:
  - ServiceProviderID
  - ServiceContext
  - VerticalServiceCode
  - AccessCode
  - DisplayText
  - WakeUpDuration
  - OSIIndicator
  - AMAServiceproviderID
  - Amp1
  - Amp2
  - ExtensionParameter
  - GenericDigitsList

When the SSP receives one of the previously listed unsupported parameters, the SSP discards the parameter and call processing continues.

5.8.3 Optionality

SOC option code AIN Service Enablers Release 7 - Create_Call (AIN00271) provides optionality for Create_Call functionality.

5.9 Network traffic management

Automatic Code Gapping (ACG) is a network management mechanism used to control network congestion. When an SCP becomes congested with queries,

it can request that an SSP slow down or stop sending queries for a desired length of time. AIN ACG has the following features:

- alerting the SCP when an attempt to add to a control list fails because the control list is full
- support of private-gap intervals and national-gap intervals
- supports global restores for both SCP and SMS control lists

See Chapter 8: “Network management” on page 287.

5.10 Messaging

AIN Service Enablers provides specific AIN 0.2 support for

- SSP and SCP call-related messages
- non call-related messages, such as ACG

5.10.1 SSP and SCP call-related messages

Separate FSSs in each FS describe SSP and SCP messages, where they apply.

5.10.2 Non call-related messages

AIN Essentials and AIN Service Enablers reference the automatic code gapping (ACG) list. To apply gapping to a number, the SCP sends a unidirectional package using an AIN Essentials subsystem number (SSN), or sends the ACG component accompanied by a call-related component in a conversation or response package.

See Chapter 8: “Network management” on page 287 for details on ACG.

AIN Service Enablers defines the Update_Request message to maintain backward compatibility. The trigger status is applicable for both AIN Essentials and AIN Service Enablers when the trigger group provisioning model is used. As in AIN Essentials, support for Update_Request extends only to a query package.

The Update message and the Update_Success message were introduced in NA009. See Section 10.2 “Update message and processing” on page 314.

For monitor resource, there are three TCAP messages: Monitor_For_Change SCP request message, Monitor_Success switch response message and Status_Reported switch response message Communication between the SCP and the SSP is by SS7 with TCAP user parts.

For information about the Monitor_For_Change query message, the Monitor_Success message and the Status_Reported message, see Chapter 9: “Resource monitoring” on page 293.

Note 1: The user can use AINTrace to trace these messages.

Note 2: AINTrace supports NCR messages ACG, MFC, Update, Update_Data, Update_Request, Update_Success, and Send_Notification. Other NCR messages are not supported by AINTrace (for example, ACG_Overflow, ACG_Global_Ctrl_Restore, ACG_Global_Ctrl_Restore_Success, or Termination_Notification)

5.11 TKTERM trigger

The AIN Trunk Group Trigger (TKTERM) feature is implemented on the Terminating Call Model (TCM) and is an enhancement to the AIN trigger processing functionality.

The following is a basic use case which shall be used as a basis for the functionality provided using the Trunk_Group_Trigger Functionality.

- The subscriber A dials the called party digits.
- The call translates to go over a public/ private facility trunk group.
- When a termination_Attempt is made on the outgoing trunk group, the trunk_group_trigger is encountered.
- A Termination_Attempt Query for the Trunk Group Trigger is launched to the SCP, with the appropriate query parameters populated.
- The SCP may respond with a valid response to the Termination_Attempt Query for the Trunk_Group_Trigger. i.e. Valid responses to the TAT Query for Trunk_Group_trigger are:
  - Authorize_Termination
  - Disconnect
  - Send_To_Resource
  - Forward_Call

If SCP Response doesn't arrive OR an invalid SCP response is received usual Post Query handling will send appropriate error responses to the SCP and progress the call according to default routing, if applicable or appropriate treatment etc.

If one of the valid Responses with appropriate parameters is received, the responses will be handled and the call will progress accordingly.

5.12 Parameter CarrierUsage

Parameter CarrierUsage allows the service switching point (SSP) to process carriers received in an SCP message as preferred carriers rather than forced carriers. Examples of SCP messages are: Analyze_Route, Forward_Call, and Create_Call.

The value of parameter CarrierUsage and the call type decides what carrier routes the call. The call type of a call is determined by the translators after translating the digits in the CalledPartyID during response translations. The translators use the datafill in table LATAXLA. CarrierUsage functionality does not look ahead to find the call type of the call.

Possible values for parameter CarrierUsage follow:

- AlwaysOverride. This value forces the SSP to use the carrier(s) sent by the SCP to route the call.
- InterlataOverride. When the call type is Interlata, this value informs the SSP to use the carrier sent by the SCP to route the call. When the call type is not Interlata, the SSP ignores the carrier sent by the SCP and uses carrier information from the SSP to route the call.
- OverridePICsOfNOCsSent. When the SCP sends CarrierUsage value 'OverridePICsOfNOCsSent', the SSP selects a valid carrier from the list of carriers sent by the SCP. A valid carrier is a carrier that can carry the type of traffic mentioned in parameter NatureOfCarrier. When the NatureOfCarrier of a valid carrier matches the call type, the SSP uses that carrier to route the call. When no carrier has a NatureOfCarrier that matches the call type, the SSP uses carrier information from the SSP to route the call.

5.13 Logs and billing records

For a description of logs used by AIN, see Chapter 27: "Logs for AIN" on page 749. For a description of AIN-related billing, see Chapter 6: "Billing" on page 227.

5.14 Provisioning

For information about provisioning AIN Service Enablers, see Part II: "Provisioning".

5.15 Tools

The following tools work with AIN Service Enablers:

- AINTrace
- TRAVER
- query commands
- TSTQuery
- Scope Change Tool (AINSCT)

5.15.1 AINTrace

AINTrace is a tool that lets a user display AIN CCS7 TCAP messages sent to or from an SCP. Captured TCAP messages are displayed in hex format along

with other related information. The information comes in the form of a log. The log display appears in either hex format, text format, or both formats (hex and text). See Chapter 21: “AIN message tracing tool” on page 463.

5.15.1.1 AINTrace options

AINTrace uses the following options:

- AINTrace option HELP indicates that AINTrace can select messages by certain message types or by agent.
- AINTrace option SELECT contains a MSG syntax.
- AINTrace option REMOVE contains a MSG syntax.
- AINTrace option STATUS displays the messages that were selected.

5.15.2 TRAVER

TRAVER is a utility that enables operating company personnel to examine, for maintenance and verification purposes, the translation and routing data of a simulated AIN Service Enablers’ call. TRAVER displays the routing and translation data for a single leg of a call. Operating company personnel specify the originating and terminating agents of the call leg. TRAVER supports all lines and trunk groups that the AIN SSP supports. TRAVER can optionally store a query message into a file for subsequent import into the TSTQuery tool. See Chapter 22:“Translation verification tool for AIN”.

5.15.3 Query commands

The query commands display AIN SSP information for DNs, LENs and logical terminals that have subscribed to AIN. The query commands include QLEN, QLENWRK, QDN, QDNWRK, QLT, QIT, QCUST, and QGRP. See Chapter 25:“Other CI commands for AIN”.

5.15.4 TSTQuery

AIN Service Enablers supports TSTQuery. It processes R02 (AIN Service Enablers) messages and R01 (AIN Essentials) message components and parameters. TSTQuery can also import query messages from a file the TRAVER tool used to store. See Chapter 23:“TSTQUERY tool”.

5.15.5 Scope change tool (AINSCT)

The Scope change tool (AINSCT) converts an existing line based subscription of PFC/SFC triggers in TRIGITM and TRIGGRP data models to a customer group based subscription in TRIGITM data model.

5.16 Operational measurements

AIN Service Enablers perform traffic measurements and maintenance measurements on AIN SSP calls. See Chapter 11:“Operational measurements for AIN”.

5.17 Limitations

See Chapter 20:“Limitations”.

6 Generic SSP procedures

6.1 Overview

Chapter six describes AIN Service Enablers messages and procedures.

6.2 Generic trigger and event processing

The following section describes the implementation of the Generic Trigger and Event Processing FS, and the generic SSP functionality that is common to the detection and processing of all triggers and events

6.2.1 Event support

This function outlines that event detection points (EDP), requests and notifications, the SPP supports. This function also outlines the generic procedures when an extended transaction is open.

6.2.2 Trigger encountering

This function provides generic procedures for the SSP to follow when it encounters a trigger. These procedures apply to all triggers and include ACG control checking, timing issues, and continuity checks.

6.2.3 Trigger item assignment

This function provides the generic functionality for the SSP to support the assignment of triggers to various SSP User Resources.

6.2.4 Serial triggering

This function provides the SSP with functionality to prevent an infinite trigger loop among SSP and network resources.

AIN Service Enablers implements serial triggering through office parameter AIN_MAX_SERIAL_TRIGGERS, in table OFCENG.

See also Section 8.7 “Attendant console interactions with OCM events” on page 396 and Section 8.8 “Serial triggering during extended transaction” on page 396.

6.2.4.1 Serial triggering and redirection parameters

The system uses any SCP redirection data to build the redirection parameters (OriginalCalledPartyID, RedirectingPartyID, and RedirectionInformation) in subsequent AIN query messages on the call.

RedirectingPartyID and RedirectionInformation parameters returned in subsequent SCP responses override existing AIN redirecting party data and increments the redirection counters.

6.2.4.2 Serial triggering and the CalledPartyID parameter

When the SCP returns a "950+ Call" call type in parameter Called PartyID, the SSP uses the "950+ Call" call type to build the CalledPartyID parameter in subsequent AIN query messages.

This return is applicable to the following lines

- coin lines
- hotel lines
- motel lines

The SSP sets the call type to "Subscriber" for all other originating agents.

6.2.5 Escape codes

This function permits subscribers to bypass a trigger. When a dialed number matches an escape code criteria, the SSP does not query the SCP or adjunct.

Refer to the individual trigger chapters for trigger-specific information on escape criteria.

6.2.6 AIN subsequent digit collection

This function provides the SSP with rules and procedures for digit collection for a dialing plan.

6.2.7 Trigger precedence

This function outlines trigger precedence rules at Trigger Detection Points in the originating and terminating call models.

6.2.8 Billing

Trigger and event call processing uses the AIN Billing system to generate and maintain billing records for all calls. See Chapter 6: "Generic SSP procedures" on page 197.

6.3 Interfaces

For the AIN Service Enablers SSP to communicate with an off-board processor, standard communication protocols must be established. The AIN Service Enablers SSP has the ability to send messages to an off-board

processor over a SS7 network transport. SSP software supports the SS7 transport layer protocol. For the AIN Service Enablers SSP to send messages across the SS7 transport layer, it must pass the information using an application layer protocol. As required by GR-1298-CORE,

Advanced Intelligent Network (AIN) 0.2 Switching Systems Generic Requirements.

The AIN Service Enablers software uses the TCAP application layer.

AIN Service Enablers SSP messages are passed between the SSP and off-board processor in TCAP components within the following TCAP packages types:

- Query (query with permission to release)—to initiate a transaction
- Response—to terminate a transaction
- Conversation (conversation with permission to release)—to maintain a transaction
- Abort—to terminate a transaction abnormally
- Unidirectional—to send messages that are not associated with a transaction

TCAP packages sent by the SSP can contain one to four components (that is, one to four AIN Service Enablers SSP messages). Response and conversation packages received by the SSP contain up to four components. Unidirectional packages contain only one component.

Further details of TCAP are not explained in this document. For further information see *Draft Proposed American National Standard for Telecommunications - SS7 - TCAP*, Issue 2 of T1.114, November 1991.

The following sections describe the various call-related, noncall-related and abnormal messages passed between the AIN Service Enablers SSP and the off-board processor.

6.4 Generic SSP query message processing

This section describes the implementation of the Generic SSP Message Processing FSS.

This section describes the generic SSP functionality that is needed to create and format messages from the SSP to the SCP or adjunct.

SCCP message segmentation provides a mechanism so that an increased amount of TCAP data can be passed between the SSP and SCP. This is achieved by splitting or segmenting the SCCP Extended Unit Data (XUDT)

messages into smaller more manageable segments, sending them, and reassembling them at the receiving end. The segmenting mechanism itself is transparent to AIN.

Prior to NA009, AIN software only processed TCAP UDT messages up to 256 bytes. Starting in NA009, AIN software processes TCAP XUDT messages up to 610 bytes. Message to the SSP must not exceed 610 bytes in size, otherwise the SSP detects the following error: Fatal Protocol Error, Badly Structured Transaction Portion. This error is handled according to Abnormal Procedures as described in GR-1299. See Section 19.1.1 “Protocol errors” on page 647.

Note: With SCCP segmentation, incoming AIN messages can be up to 1024 bytes long. However, all planned GR-1299 messages are less than the maximum supported message size of 610 bytes. The limit of 610 bytes is applied to minimize processor time and memory waste.

6.4.1 Generic SCCP procedure

This function provides low level generic SSP functionality to receive and send Unit Data (UDT) messages, message segmentation and, SCCP parameter population.

The SSP sends initial and subsequent SCCP UDT messages to the SCP. The SSP also accepts and processes these messages from the SCP.

6.4.2 SCCP procedure for SSP initial message

This function provides the SCCP procedures for sending messages from the SSP to the SCP by using Global Title Translation routing.

6.4.3 SCCP procedure for SSP subsequent message

This function provides the SCCP procedures for sending messages from the SSP to the SCP once the Destination Point Code (DPC) and subsystem number of the assisting SCP have been established from messages received from the SCP.

6.4.4 Call-related query message processing

This function provides the SSP with transaction and component level procedures for sending call related messages to the SCP, as well as population rules for the SSP messages and parameters.

When a call meets the criteria at a TDP or EDP, the SSP sends a query message to the SCP to ask for further instructions for call processing. Valid query messages include

- Origination_Attempt trigger request
- Info_Collected trigger request

- Info_Analyzed trigger request
- Network_Busy trigger request
- O_Called_Party_Busy trigger request
- O_Called_Party_Busy event request
- O_Answer event request
- O_No_Answer trigger request
- O_No_Answer event request
- O_Disconnect event query
- O_Disconnect_Called event query
- Termination_Attempt
- T_Busy trigger request
- T_Busy event request
- T_No_Answer trigger request
- T_No_Answer event request
- T_Answer event request
- Term_Resource_Available
- Timeout event query

See Section 20.3 “Messaging and parameter limitations” on page 671 for limitations associated with messaging.

In the following message parameter tables

- the parameters are listed alphabetically, not in the order listed in the ASN.1 format of the message.
- optional parameters have (O) after their name
- mandatory parameters have (M) after their name

6.4.4.1 Origination_Attempt trigger request message

Table 39 lists the parameters that make up the Origination_Attempt message.

Table 39 Origination_Attempt message parameters

Parameter	Description
ACGEncountered (O)	See Section 6.4.4.19.2 on page 219.
AMASequenceNumber (O)	
Amp1 (O)	
Amp2 (O)	
BearerCapability (M)	See Section 6.4.4.19.4 on page 220.
CallingPartyID (O)	See Section 6.4.4.19.11 on page 223.
Carrier (O)	See Section 6.6.13.5 on page 299.
ChargeNumber (O)	See Section 6.4.4.19.14 on page 227.
ChargePartyStationType (O)	See Section 6.4.4.19.15 on page 230.
ExtensionParameter (O)	
Lata (O)	See Section 6.4.4.19.21 on page 234.
NotificationIndicator (O)	
Sap (O)	
TriggerCriteriaType (O)	See Section 6.4.4.19.35 on page 246.
UserID (M)	See Section 6.4.4.19.36 on page 247.
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.4.4.2 Info_Collected trigger request message

Table 40 lists the parameters that make up the Info_Collected message.

Table 40 Info_Collected message parameters

Parameter	Description
AccessCode (O)	See Section 6.4.4.19.1 on page 218.
ACGEncountered (O)	See Section 6.4.4.19.2 on page 219.
AMASequenceNumber (O)	
Amp1 (O)	
Amp2 (O)	
BearerCapability (M)	See Section 6.4.4.19.4 on page 220.
CallingPartyID (O)	See Section 6.4.4.19.11 on page 223.
Carrier (O)	See Section 6.4.4.19.7 “Carrier parameter”.
ChargeNumber (O)	See Section 6.4.4.19.14 on page 227.
ChargePartyStationType (O)	See Section 6.4.4.19.15 on page 230.
CollectedAddressInfo (O)	See Section 6.4.4.19.16 on page 231.
CollectedDigits (O)	See Section 6.4.4.19.17 on page 231.
ExtensionParameter (O)	
GenericAddressList (O)	See Section 6.4.4.19.19 on page 232.
Lata (O)	See Section 6.4.4.19.21 on page 234.
OriginalCalledPartyID (O)	See Section 6.4.4.19.25 on page 238.
Prefix (O)	See Section 6.4.4.19.32 on page 245.
RedirectingPartyID (O)	See Section 6.4.4.19.25 on page 238.
RedirectionInformation (O)	See Section 6.4.4.19.25 on page 238.
Sap (O)	
Tcm (O)	

(M): Mandatory parameter (O): Optional parameter

Note: Parameters in shaded areas are not supported in this message for this release.

Table 40 Info_Collected message parameters (Continued)

Parameter	Description
TriggerCriteriaType (O)	See Section 6.4.4.19.35 on page 246.
UserID (M)	See Section 6.4.4.19.36 on page 247.
VerticalServiceCode (O)	Functionality inherited from AIN Essentials.
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.4.4.3 Info_Analyzed trigger request message

Table 41 lists the parameters that make up the Info_Analyzed trigger request message.

Table 41 Info_Analyzed message parameters

Parameter	Description
AccessCode (O)	See Section 6.4.4.19.1 on page 218.
ACGEncountered (O)	See Section 6.4.4.19.2 on page 219.
AMASequenceNumber (O)	
Amp1 (O)	
Amp2 (O)	
BearerCapability (M)	See Section 6.4.4.19.4 on page 220.
CalledPartyID (O)	See Section 6.4.4.19.8 on page 222.
Calling Geodetic Location (O)	See Section 6.4.4.19.10 on page 223
CallingPartyBGID (O)	See Section 6.4.4.19.12 on page 225.
CallingPartyID (O)	See Section 6.4.4.19.11 on page 223.
Carrier (O)	See Section 6.4.4.19.7 on page 221.
ChargeNumber (O)	See Section 6.4.4.19.14 on page 227.
ChargePartyStationType (O)	See Section 6.4.4.19.15 on page 230.
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

Table 41 Info_Analyzed message parameters (Continued)

Parameter	Description
CollectedAddressInfo (O)	See Section 6.4.4.19.16 on page 231.
CollectedDigits (O)	See Section 6.4.4.19.17 on page 231.
CTRConnection	
ExtensionParameter (O)	
GenericAddressList (O)	See Section 6.4.4.19.19 on page 232.
Generic Digits List (O)	See Section 6.4.4.19.20 on page 233
NetworkSpecificFacilities (O)	See Section 6.4.4.19.23 on page 235.
Lata (O)	See Section 6.4.4.19.21 on page 234.
OriginalCalledPartyID (O)	See Section 6.4.4.19.25 on page 238.
Prefix (O)	See Section 6.4.4.19.32 on page 245.
RedirectingPartyID (O)	See Section 6.4.4.19.25 on page 238.
RedirectionInformation (O)	See Section 6.4.4.19.25 on page 238.
Sap (O)	
STRConnection (O)	
Tcm (O)	See Section 6.4.4.19.34 on page 245.
TriggerCriteriaType (O)	See Section 6.4.4.19.35 on page 246.
UserID (M)	See Section 6.4.4.19.36 on page 247.
VerticalServiceCode (O)	Functionality inherited from AIN Essentials.
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.4.4.4 Network_Busy event request message

Table 42 lists the parameters that make up the Network_Busy event request message.

Table 42 Network_Busy event request message parameters

Parameter	Description
Amp1 (O)	
Amp2 (O)	
BearerCapability (M)	See Section 6.4.4.19.4 on page 220.
ExtensionParameter (O)	
NotificationIndicator (O)	See Section 6.4.4.19.24 on page 238.
UserID (M)	See Section 6.4.4.19.36 on page 247.
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.4.4.5 Network_Busy trigger request message

Table 43 lists the parameters that make up the Network_Busy trigger request message.

Table 43 Network_Busy trigger request message parameters

Parameter	Description
ACGEncountered (O)	See Section 6.4.4.19.2 on page 219.
AMASequenceNumber (O)	
Amp1 (O)	
Amp2 (O)	
BearerCapability (M)	See Section 6.4.4.19.4 on page 220.
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

Table 43 Network_Busy trigger request message parameters (Continued)

Parameter	Description
CallingPartyID (O)	See Section 6.4.4.19.11 on page 223.
Carrier (O)	See Section 6.4.4.19.7 on page 221.
ChargeNumber (O)	See Section 6.4.4.19.14 on page 227.
ChargePartyStationType (O)	See Section 6.4.4.19.15 on page 230.
ExtensionParameter (O)	
Lata (O)	See Section 6.4.4.19.21 on page 234.
OriginalCalledPartyID (O)	See Section 6.4.4.19.25 on page 238.
Prefix (O)	See Section 6.4.4.19.32 on page 245.
RedirectingPartyID (O)	See Section 6.4.4.19.25 on page 238.
RedirectionInformation (O)	See Section 6.4.4.19.25 on page 238.
Sap (O)	
Tcm (O)	
TriggerCriteriaType (O)	See Section 6.4.4.19.35 on page 246.
UserID (M)	See Section 6.4.4.19.36 on page 247.
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.4.4.6 O_Called_Party_Busy trigger request message

Table 44 lists the parameters that make up the O_Called_Party_Busy trigger request message.

Table 44 O_Called_Party_Busy trigger request message parameters

Parameter	Description
ACGEncountered (O)	See Section 6.4.4.19.2 on page 219.
AMASequenceNumber (O)	
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

Table 44 O_Called_Party_Busy trigger request message parameters (Contin-

Parameter	Description
Amp1 (O)	
Amp2 (O)	
BearerCapability (M)	See Section 6.4.4.19.4 on page 220.
BusyCause (O)	See Section 6.4.4.19.5 on page 221.
CalledPartyID (O)	See Section 6.4.4.19.8 on page 222.
CallingPartyID (O)	See Section 6.4.4.19.11 on page 223.
Carrier (O)	See Section 6.4.4.19.7 on page 221.
ChargeNumber (O)	See Section 6.4.4.19.14 on page 227.
ChargePartyStationType (O)	See Section 6.4.4.19.15 on page 230.
CTRConnection	
ExtensionParameter (O)	
Lata (O)	See Section 6.4.4.19.21 on page 234.
OriginalCalledPartyID (O)	See Section 6.4.4.19.25 on page 238.
Prefix (O)	See Section 6.4.4.19.32 on page 245.
RedirectingPartyID (O)	See Section 6.4.4.19.25 on page 238.
RedirectionInformation (O)	See Section 6.4.4.19.25 on page 238.
Sap (O)	
STRConnection (O)	See Section 6.4.4.19.33 on page 245.
TriggerCriteriaType (O)	See Section 6.4.4.19.35 on page 246.
UserID (M)	See Section 6.4.4.19.36 on page 247.
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.4.4.7 O_Called_Party_Busy event request message

Table 45 lists the parameters that make up the O_Called_Party_Busy event request message.

Table 45 O_Called_Party_Busy event request message parameters

Parameter	Description
Amp1 (O)	
Amp2 (O)	
BearerCapability (M)	See Section 6.4.4.19.4 on page 220.
BusyCause (O)	See Section 6.4.4.19.5 on page 221.
ExtensionParameter (O)	
NotificationIndicator (O)	See Section 6.4.4.19.24 on page 238.
UserID (M)	See Section 6.4.4.19.36 on page 247.
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.4.4.8 O_Answer event notification message

Table 46 lists the parameters that make up the O_Answer event notification message.

Table 46 O_Answer event notification message parameters

Parameter	Description
Amp1 (O)	
Amp2 (O)	
BearerCapability (M)	See Section 6.4.4.19.4 on page 220.
ExtensionParameter (O)	
NotificationIndicator (O)	See Section 6.4.4.19.24 on page 238.
UserID (M)	See Section 6.4.4.19.36 on page 247.
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.4.4.9 O_No_Answer trigger request message

Table 47 on page 210 lists the parameters that make up the O_No_Answer trigger request message.

Table 47 O_No_Answer trigger request message parameters

Parameter	Description
ACGEncountered (O)	See Section 6.4.4.19.2 on page 219.
AMASequenceNumber (O)	
Amp1 (O)	
Amp2 (O)	
BearerCapability (M)	See Section 6.4.4.19.4 on page 220.
CalledPartyID (O)	See Section 6.4.4.19.8 on page 222.
CallingPartyID (O)	See Section 6.4.4.19.11 on page 223.
Carrier (O)	See Section 6.4.4.19.7 on page 221.
ChargeNumber (O)	See Section 6.4.4.19.14 on page 227.
ChargePartyStationType (O)	See Section 6.6.13.18 on page 320.
CTRConnection	
ExtensionParameter (O)	
Lata (O)	See Section 6.4.4.19.21 on page 234.
OriginalCalledPartyID (O)	See Section 6.4.4.19.25 on page 238.
Prefix (O)	See Section 6.4.4.19.32 on page 245.
RedirectingPartyID (O)	See Section 6.4.4.19.25 on page 238.
RedirectionInformation (O)	See Section 6.4.4.19.25 on page 238.
Sap (O)	
STRConnection (O)	
TriggerCriteriaType (O)	See Section 6.4.4.19.35 on page 246.
UserID (M)	See Section 6.4.4.19.36 on page 247.
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.4.4.10 O_No_Answer event request message

Table 46, on page 209 lists the parameters that make up the O_No_Answer event request message.

Table 48 O_No_Answer event request message parameters

Parameter	Description
Amp1 (O)	
Amp2 (O)	
BearerCapability (M)	See Section 6.4.4.19.4 on page 220.
ExtensionParameter (O)	
NotificationIndicator (O)	See Section 6.4.4.19.24 on page 238.
UserID (M)	See Section 6.4.4.19.36 on page 247.
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.4.4.11 O_Disconnect EDP-R query message

The following tabe lists all O_Disconnect EDP-R query message parameters.

Table 49 O-Disconnect EDP-R messages parameters

Parameter Name	O-Disconnect Event Query Parameter Suport	O-Disconnect_Called Event Query Parameter Support
UserID (M)	Y	Y
BearerCapability (M)	Y	Y
LegID (O)	Y	Y
PointIncALL (O)	Y	Y
DisconnectCause (O)	NS	Y
Amp1 (O)	NS	NS
Amp2 (O)	NS	NS
ExttensionParameter (O)	NS	NS

Table 49 O-Disconnect EDP-R messages parameters

Parameter Name	O-Disconnect Event Query Parameter Suport	O-Disconnect_Called Event Query Parameter Support
Notificaton Indicator	Y	Y
Note: Bold with (M) are mandatory. Non-supported parameters are shown highlighted.		

6.4.4.12 Termination_Attempt message

Table 50 lists the parameters that make up the Termination_Attempt message.

Table 50 Termination_Attempt message parameters

Parameter	Description
ACGEncountered (O)	See Section 6.4.4.19.2 on page 219.
AMASequenceNumber (O)	
Amp1 (O)	
Amp2 (O)	
BearerCapability (M)	See Section 6.4.4.19.4 on page 220.
CalledPartyID (O)	See Section 6.4.4.19.8 on page 222.
CalledPartyStationType (O)	See Section 6.4.4.19.9 on page 223.
Calling Geodetic Location (O)	See Section 6.4.4.19.10 on page 223
CallingPartyID (O)	See Section 6.4.4.19.11 on page 223.
ChargeNumber (O)	See Section 6.4.4.19.14 on page 227.
ChargePartyStationType (O)	See Section 6.4.4.19.15 on page 230.
CTRConnection	
ExtensionParameter (O)	
Generic Digits List (O)	See Section 6.4.4.19.20 on page 233
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

Table 50 Termination_Attempt message parameters (Continued)

Parameter	Description
GenericAddressList (O)	See Section 6.4.4.19.19 on page 232. Also see Section 6.6.13.18 on page 320.
GenericName (O)	See Section 6.4.4.19.37 on page 249.
Lata (O)	See Section 6.4.4.19.21 on page 234.
OriginalCalledPartyID (O)	See Section 6.4.4.19.25 on page 238.
RedirectingPartyID (O)	See Section 6.4.4.19.25 on page 238.
RedirectionInformation (O)	See Section 6.4.4.19.21 on page 234.
RTPServiceIndicator	
Sap (O)	
STRConnection (O)	
Tcm (O)	
TriggerCriteriaType (O)	See Section 6.4.4.19.35 on page 246.
UserID (M)	See Section 6.4.4.19.36 on page 247.
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.4.4.13 T_Busy trigger request message and processing

Table 51 lists the parameters that make up T_Busy trigger request message

Table 51 T_Busy trigger request message parameters

Parameter	Description
ACGEncountered	See Section 6.4.4.19.2 on page 219
AMASequenceNumber (O)	
Amp1 (O)	
(a) new value “tBusy” introduced to support T_Busy trigger. (M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

Table 51 T_Busy trigger request message parameters (Continued)

Parameter	Description
Amp2 (O)	
BearerCapability (M)	See Section 6.4.4.19.4 on page 220.
BusyCause (O)	See Section 6.4.4.19.5 on page 221.
BusyType (O)	See Section 6.4.4.19.6 on page 221.
CalledPartyID (O)	See Section 6.4.4.19.8 on page 222.
CalledPartyStationType (O)	See Section 6.4.4.19.9 on page 223.
CallingPartyID (O)	See Section 6.4.4.19.11 on page 223.
ChargeNumber (O)	See Section 6.4.4.19.14 on page 227.
ChargePartyStationType (O)	See Section 6.4.4.19.15 on page 230.
GenericName (O)	See Section 6.4.4.19.37 on page 249.
ExtensionParameter (O)	
Lata (O)	See Section 6.4.4.19.21 on page 234.
OriginalCalledPartyID (O)	See Section 6.4.4.19.25 on page 238.
RedirectingPartyID (O)	See Section 6.4.4.19.25 on page 238.
RedirectionInformation (O)	See Section 6.4.4.19.25 on page 238.
Sap (O)	
STRConnection (O)	
TriggerCriteriaType (O)	See Section 6.4.4.19.35 on page 246.(a)
UserID (M)	See Section 6.4.4.19.36 on page 247.
(a) new value “tBusy” introduced to support T_Busy trigger. (M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

When the T_Busy trigger is detected, the serial trigger count increments, and the trigger T_Busy request message is sent to the SCP. Busy indication is not provided to the calling party by the SSP at this point. The T_Busy TDP-Request query can only be sent when the appropriate busy conditions are met.

When the SSP receives the SCP response, it decodes the response and processes the call according to the instructions it contains.

Valid SCP response messages include:

- Continue message
- Forward_Call message
- Send_To_Resource message

When the SSP receives a Send_Notification message along with a Forward_Call or Continue or Send_To_Resource message in response to a T_Busy trigger query, and when the call is released, a Termination_Notification message is sent to the SCP.

6.4.4.14 T_Busy event request message

Table 52 lists the parameters that make up the T_Busy event request message.

Table 52 T_Busy event request message parameters

Parameter	Description
Amp1 (O)	
Amp2 (O)	
BearerCapability (M)	See Section 6.4.4.19.4 on page 220.
BusyCause (O)	See Section 6.4.4.19.5 on page 221.
BusyType (O)	See Section 6.4.4.19.6 on page 221.
ExtensionParameter (O)	
NotificationIndicator (O)	See Section 6.4.4.19.24 on page 238.
UserID (M)	See Section 6.4.4.19.36 on page 247.
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.4.4.15 T_No_Answer trigger request message and processing

Table 53 lists the parameters that make up the T_No_Answer trigger request message.

Table 53 T_No_Answer trigger request message parameters

Parameter	Description
ACGEncountered	Section 6.4.4.19.2 on page 219
AMASequenceNumber (O)	
Amp1 (O)	
Amp2 (O)	
BearerCapability (M)	See Section 6.4.4.19.4 on page 220
CalledPartyID (O)	Functionality inherited from AIN Essentials
CalledPartyStationType(O)	Functionality inherited from AIN Essentials
CallingPartyID (O)	Functionality inherited from AIN Essentials.
ChargeNumber (O)	See Section 6.4.4.19.14 on page 227
ChargePartyStationType (O)	See Section 6.4.4.19.15 on page 230
GenericName(O)	See Section 6.4.4.19.37 on page 249.
ExtensionParameter (O)	
Lata (O)	Functionality inherited from AIN Essentials.
OriginalCalledPartyID (O)	Functionality inherited from AIN Essentials.
RedirectingPartyID (O)	Functionality inherited from AIN Essentials.
RedirectionInformation (O)	Functionality inherited from AIN Essentials.
Sap (O)	
STRConnection (O)	
TriggerCriteriaType (O)	See Section 6.4.4.19.35 on page 246. (a)
UserID (M)	See section 6.4.4.13.10
(a) new value “tNoAnswer” introduced for T_No_Answer trigger (M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.4.4.16 T_No_Answer event request message

Table 54 lists the parameters that make up the T_No_Answer event request message.

Table 54 T_No_Answer event request message parameters

Parameter	Description
Amp1 (O)	
Amp2 (O)	
BearerCapability (M)	See Section 6.4.4.19.4 on page 220.
ExtensionParameter (O)	
NotificationIndicator (O)	See Section 6.4.4.19.24 on page 238.
UserID (M)	See Section 6.4.4.19.36 on page 247.
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.4.4.17 T_Answer event request message

Table 55 lists the parameters that make up the T_No_Answer event request message.

Table 55 T_Answer event request message parameters

Parameter	Description
Amp1 (O)	
Amp2 (O)	
BearerCapability (M)	See Section 6.4.4.19.4 on page 220.
ExtensionParameter (O)	
NotificationIndicator (O)	See Section 6.4.4.19.24 on page 238.
UserID (M)	See Section 6.4.4.19.36 on page 247.
(a) new value “tNoAnswer” introduced for T_No_Answer trigger ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.4.4.18 Timeout Requested Event message processing

The following table list all parameters for the Timeout EDP-R query message.

Table 56 Timeout Requested event message parameters

Parameter Name	Timeout Requested Event Query Message Support
UserID (M)	Y
BearerCapability (M)	Y
LegID (O)	Y
BCMType (O)	Y
PointInCall (O)	Y
CcId (O)	Y
Amp1 (O)	N/S
Amp2 (O)	N/S
ExtensionParameter (O)	N/S
Notification Indicator	Y
Note: Bold with (M) are mandatory. Non-suported parameters are shown highlighted.	

6.4.4.19 Query message parameters

All AIN Service Enablers message parameters are the same or a superset of the equivalent AIN Essentials message parameters.

See Section 20.3 “Messaging and parameter limitations” on page 671 for limitations associated with parameters.

6.4.4.19.1 AccessCode parameter The AccessCode is defined as any of the following codes:

- an access code to the public network
- an access code to a trunk group (for example, ESN access code)
- an attendant access code
- feature access codes

Note: Not all of the above are supported. See Section 20.3.6 “Parameter AccessCode” on page 673.

The AINDigits format is used with the following fields:

- nature of number is set to “Not Applicable”, network specific is mapped onto the first “reserved for network specific use” value of the nature of number indicator within the AINdigits format; that is, binary -11110000.
- numbering plan is set to “Unknown or not applicable”
- the digits field contains an access of code of one to five digits inclusive

The AccessCode parameter is sent in the following SSP-to-SCP messages:

- the Info_Collected message is sent when the SSP has detected an access code
- the Info_Analyzed message is sent when the trigger is CDP and the access code caused the SSP to trigger

For exceptions see Section 20.3.6 “Parameter AccessCode” on page 673.

6.4.4.19.2 ACGEncountered parameter

This parameter shows that an ACG control has been encountered.The ACG consists of the following three values:

- SCP Overload Controls Indicator
- SMS Initiated Controls Indicator
- ACG control type

The control type is defined as being the number of digits required to encode the control. It complies to requirement 202 of GR-1299-CORE Issue 3

6.4.4.19.3 BCMType

This parameter indicates whether the passive leg for which the Timeout event is detected occurs in the Originating or Terminating BCM. The SSP populates the BCMType parameter in accordance with the following table.

Table 57 Population Rules for the BCMType Parameter in Timeout Requested EDP-R Message

Controlling Party BCM	BCMType Value
oBCM	0
tBcm	1

6.4.4.19.4 BearerCapability parameter The DMS SSP populates the BearerCapability as specified in GR-1298 based on datafill. Office parameter Default_Bearer_Capability in the OFCENG table is used to specify the bearer capability of the analog lines or conventional trunks that are not dedicated to PSDS data calls.

The BearerCapability parameter contains the bearer capability of the call that encountered the trigger. This parameter is a mandatory parameter in all outgoing messages. See Table 58.

Table 58 Incoming and AIN bearer capability

Incoming bearer capability	AIN BearerCapability
Speech	Speech
3.1kHz	f31kHzaudio
7kHz	f7kHzaudio
unrestricted digital information with rate adaptation	b56kbps
unrestricted digital information without rate adaptation	b64kbps

An IBN line can change its bearer capability by dialing the BC FTR selector datafilled in IBNXLA. This value maps to the appropriate AIN Bearer Capability value defined above. When the bearer capability has not been changed through the BC feature or the call originated from a POTS line, the default bearer capability is used. This is the DEFAULT_BEARER_CAPABILITY office parameter defined in table OFCENG. NOTE: this can either be 3.1kHz or SPEECH.

There are two valid values for the BC parameter when the originating access is a line; either 3.1kHz or speech depending on the datafill and whether or not the BC feature is available on the switch.

For non-SS7 trunks, the bearer capability can be assigned to the trunk with the BCNAME option in table TRKGRP. When this option has not been datafilled against the trunk group, then the default Bearer Capability from table OFCENG is used.

For ISUP and PRI trunks, the bearer capability is a mandatory parameter in the incoming SETUP message. The information transfer capability received is mapped to the AIN Bearer Capability value as indicated above.

Note: When the bearer capability of the call cannot be mapped to the AIN bearer capability as described above, then the call is sent to treatment.

Public Switched Digital Service calls are not supported by this feature: however, in the future, all calls of this type is mapped to a Bearer Capability of b56kbps.

6.4.4.19.5 BusyCause parameter All required cause values are supported, as specified in Table 125 on page 384.

In addition, in the O_Called_Party_Busy message, cause value "3 - No Route To Destination" is also supported on an attempt to terminate on an AIN virtual DN (VDN).

Note: PRI Interface is not treated as a line.

See also Section 20.3.23 "Parameter TerminationIndicator" on page 680 for limitations associated with this parameter.

6.4.4.19.6 BusyType parameter Since the SCP response message Offer_Call is not supported, parameter BusyType is populated as "callCannotBeOffered."

Parameter BusyType is controlled by SOC option AIN00220.

6.4.4.19.7 Carrier parameter Parameter Carrier contains the carrier selection information and the identification describing where a call should be routed. Parameter Carrier is only applicable when the office is an equal access end office (EAEO).

The Carrier format is used with the following fields:

- carrier selection field is determined either by the point in the call (for Origination_Attempt message) or by the dialling sequence (for all other messages).
- carrier ID field contains the 4 digit primary identification code. When a three digit code is available the digit 0 is prefixed to the carrier ID.
- Nature Of Carrier field contains a default value of 'NoNOCProvided'

The Carrier parameter is sent in the following SSP-to-SCP messages:

- Origination_Attempt message: the carrier selection field is "selected carrier identification code presubscribed and not input by the calling party". This is the only value that makes sense because no digits have been collected when the origination attempt TDP is encountered. However, population of the Carrier parameter for all presubscribed cases depends on the proper Carrier provisioning on the DMS SSP.
- Info_Collected, Info_Analyzed and Network_Busy messages: the population of the fields use logic similar to TR-TSY-000693

Presubscription Indication to determine how to populate the carrier selection field.

6.4.4.19.8 CalledPartyID parameter This parameter contains the address of the called party. This parameter is present when the SSP detects a 3/6/10 digit trigger, trigger N11, trigger AFR or trigger Termination_Attempt.

The CalledPartyID parameter is checked for the following values:

- number of digits is in the range 0 to 15, inclusive
- the value of each digit is 0 through 9 or ‘D’ or ‘E’ or ‘F’
- the Nature_of_Number is one of
  - not applicable
  - SubscriberNumber (1)
  - NationalSignificant (3)
  - InternationalNumber (4)
  - SubscriberNumberOperReq0Plus (113)
  - NationalNumberOperReq0Plus (114)
  - InternationalNumberOperReq0Plus (115)
  - NoAddressPresentOperReq (116)
  - NoAddressPresentCutThrough (117)
  - LECHotelNonEAE)950PlusCall (118)
  - TestLineTestCode (119)
  - NetworkReserved0 (120) through NetworkReserved6 (126)
- when the Nature_of_Number is NAAINNumber then the Numbering_Plan must be one of
  - UnknownNumberingPlan (0),
  - Private (5)
- when the Nature_of_Number is one of NetworkReserved0 through NetworkReserved6, the Numbering_Plan must be Private (5)
- when the Nature_of_Number is SubscriberNumber or SubscriberNumberOperReq0Plus, the number of digits must be either 3 or 7
- when the Nature_of_Number is NationalSignificant or NationalNumberOperReq0Plus, the number of digits must be 10

- when the Nature_of_Number is InternationalNumber or InternationalNumberOperReq0Plus, the number of digits must be 10, 11, 12, 13, 14 or 15
- when the number of digits is 3, and the first three digits are X11, or when the number of digits is 7, and the first three digits are 950, then Nature_of_Number must be NationalSignificant and Numbering_Plan must be ISDNNumberingPlan, or Nature_of_Number must be NationalNumberOperReq0Plus and Numbering_Plan must be ISDNNumberingPlan

Any errors are reported to the SCP as erroneous data value.

Note: Either the CalledPartyID or FacilityGID must be present. When both are present, FacilityGID is ignored and CalledPartyID is used. When neither are present, a fatal application error of missing conditional parameter is raised.

See Chapter 20.3.7: “Parameter CalledPartyID” on page 673.

6.4.4.19.9 CalledPartyStationType parameter Parameter CalledPartyStationType uses the same format as ChargePartyStationType. The originating line information for the CalledPartyStationType is obtained in exactly the same way as the Origination_Attempt TDPs ChargePartyStationType except that the called party’s information is used.

See Section 6.4.4.19.15 “ChargePartyStationType parameter” on page 230.

6.4.4.19.10 Calling Geodetic Location parameter The wireless caller’s X and Y co-ordinates specifying the callers location may be signalled in the Calling Geodetic Location Parameter. If available in the incoming ISUP IAM, the calling geodetic location parameter is encoded in the AIN query as follows:

- Shape description of type ellipsoid point and ellipsoid point with uncertainty (as supported in the SS7 ISUP IAM). These types specify the latitude and longitude of the caller’s location. Other shape descriptions as ellipsoid point with altitude and uncertainty, ellipse on ellipsoid, ellipsoid circle sector, polygon etc., (not supported in SS7 in the signalling) are not supported in AIN query messages.
- This parameter has types defined per ANSI T1S1.3/99-315.

6.4.4.19.11 CallingPartyID parameter The CallingPartyID parameter contains either the DN of the originating line, the Q931 Calling Party Number Information Element (when provided and passed screening), or the ISDNUP Calling Party Number.

Note: When the SCP has provided the SSP with a new CallingPartyID, this value is used to populate any subsequent queries.

The format of the CallingPartyID parameter uses the AINDigits parameter as described in the following paragraphs.

When a Q931 Calling Party Number Information Element is present, then the contents of "Type of Number and Numbering Plan Identification" field is mapped to the corresponding "Nature of Number" and "Numbering Plan" fields. The "Origin of Number and Presentation Status" field is mapped to the "Presentation Restriction Indicator" and "Screening Indicator" fields. The "Digits" are translated from International Alphabet 5 (IA5) to BCD.

When a Q931 Calling Party Number Information Element is not present, then the default Calling Party Number associated with the trunk group is taken from table LTDATA (DN option). The Calling Party ID parameter fields are set as follows: "Nature of Number" is set to 'Unknown or Not Applicable', "Screening" is set to 'network provided', "Presentation" is set to 'Presentation Allowed' and "Numbering Plan" is set to ISDN.

When a ISDNUP Calling Party Number parameter is present, then the "Nature of Address" is mapped to the "Nature of Number" field. The "Numbering Plan Indication" is mapped to the "Numbering Plan" field. Similarly, the "Address Presentation Restriction Indicator", the "Address Screening Indicator", and the "Digits" are all mapped to their corresponding fields.

When the calling party is the DN of the originating line, then a ten digit North American Numbering Plan (NANP) number in BCD form is placed in the "Digits" field. The "Numbering Plan" field contains "ISDN Numbering Plan". The "Screening indicator" field always contains "Network Provided".The "Nature of Number" field is encoded as either "unique national number" or "non-unique national number". The determination of (non)uniqueness is through datafill of table DNATTRS. The DNATTRS datafill also affects the contents of the "Presentation Restriction Indicator" field.

In table DNATTRS, the user can specify suppression and uniqueness through datafill of the "netopt" field on a DN or network basis. For AIN calls querying to the database, the "public" network is referenced for a particular DN. When the corresponding network options contains the "non-unique" option, then the "Nature of Number" field is encoded as "non-unique national number"; otherwise, the "Nature of Number" field is encoded as "unique national number".

Another DNATTRS' network option that affects the CallingPartyID is the "suppress" option. The user is allowed to specify whether the DN, the name, or both are to be suppressed. When the DNATTRS datafill specifies to suppress on a DN basis, then the "Presentation Restriction Indicator" field is

encoded to “Presentation Restricted”; otherwise, the “Presentation Restriction Indicator” field is encoded to “Presentation Allowed”.

In table DNGRPS, the user can specify the “address” option for a group of directory numbers. When a 10 digit “public address” is specified in DNGRPS for the calling party, the 10 digit “public address” number is sent in the query message in the CallingPartyID parameter.

Table DNGRPS can also specify the “suppress” option for a group of directory numbers. However, the “suppress” option in table DNATTRS takes precedence over the “suppress” option in DNGRPS. Thus, when no “public suppress” option is datafilled in DNATTRS for the calling party, the value of the “public suppress” option datafilled for the calling party in DNGRPS is used to populate the “Presentation Restriction Indicator” field in the CallingPartyID.

6.4.4.19.12 CallingPartyBGID parameter

The CallingPartyBGID parameter is sent in the Info_Analyzed message under the following conditions:

- when the originating access (caller or forwarding station) is assigned to a basic or multiswitch business group (BBG or MBG) and the CDP trigger is hit
- when the originating access is an SS7 trunk and the IAM message contains a Business Group parameter and the SDS (PODP) trigger is hit

All fields in the CallingPartyBGID parameter are supported except for the Subgroup-ID field that is not supported by ISDN User Part (ISUP) messaging on the DMS SSP. Whenever ISUP MBG parameter population evolves to support the population of this field, the Calling Party BGID feature automatically supports it as well. Until ISUP supports that field, the Subgroup-ID field is always set to “No_Indication”.

Set the BGID type field of the CallingPartyBGID parameter to BG Identifier.

Table 59 gives a summary of how the CallingPartyBGID parameter is populated:

Table 59 CallingPartyBGID parameter population

Field	Value
Party Selector	“Calling Party Number” when no call forwarding is involved, otherwise “Redirecting Number”
LPII	Fixed Line Privileges
BGID tp	BG Identifier

Table 59 CallingPartyBGID parameter population

Field	Value
AttSt	When call is from an Attendant line then “Attendant Line” else “No Indication”.
Spare	0
Business Group ID	BGID fetched from Business Group data
Sub-group ID	No Indication
Line Privileges	Unrestricted

The BGID that is sent in the query is mapped from the BGID assigned in table BGDATA to a unique number for a particular business group. This value is in a different format than the BGID in table BGDATA and the understanding of mapping procedure is essential in order to identify the exact BGID value that is received by SCP.

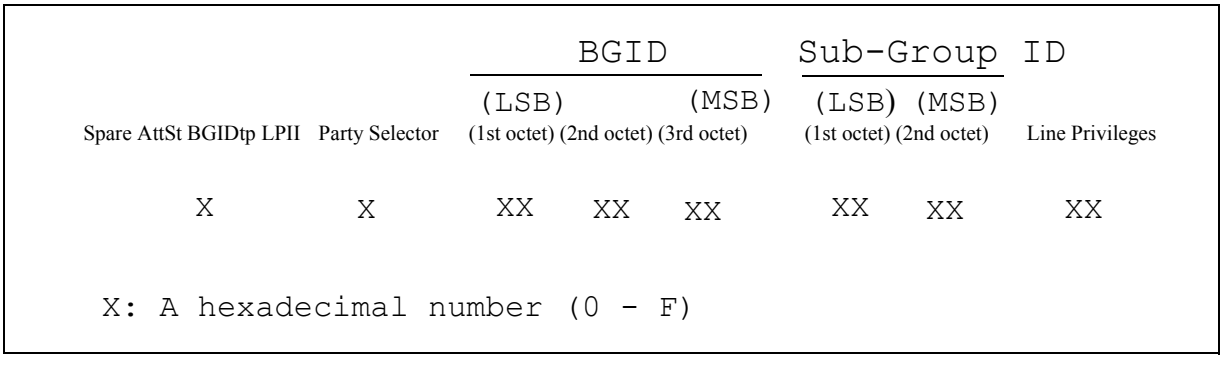
The multi-part key ‘BGID’ in table BGDATA has two parts; LOCATION that can have the values {LOCAL, NATIONAL} and GRPNUM that can have values from 0 to 4194303 (LOCAL 0 is reserved). The mapping is performed according to the following formula:

222 * LOCATION + GRPNUM (from BGDATA) = BGID (in CallingPartyBGID parameter)

Note that LOCAL is translated to 0 and NATIONAL is translated to 1.

A few examples helps in clarifying this mapping. These examples show the BGID field inside CallingPartyBGID parameter in bold letters. The CallingPartyBGID parameter in hexadecimal form is shown starting with first octet on the left side. Figure 4 shows the correspondence between hexadecimal values shown in examples and the parameter fields.

Figure 4 CallingPartyBGID parameter fields and corresponding octets



6.4.4.19.13 CcId

This parameter identifies the call configuration (CC) of the controller when the Timeout event is detected. Valid call configurations for detecting Timeout are CC2, CC5, CC6, CC7, CC8, CC9, CC10, CC11 and CC12. The SSP populates the Ccld parameter in accordance with the following table.

Table 60 Population Rules for the CcID Parameter in Timeout Requested EDP-R Message

Call Configuration	CcID Value
stable2Party	2
threePartySetupComplement	5
partyOnHold	6
partyOnHoldComplement	7
callWaiting	8
callWaitingComplement	9
stableMParty	10
transfer	11
forward	12

6.4.4.19.14 ChargeNumber parameter This parameter is typically populated by the charge number, or by ANI information from the originating facility. For SS7 trunks, when the charge number is not provided in the IAM message and parameter OLI is present, the calling party number is used to populate parameter ChargeNumber in the query message.

For trunk originated calls, when neither 10 or 7 digit charge number are provided, AIN Service Enablers checks the incoming trunk in table TRKGRP (SNPA field) for NPA (area code) and table SSPTKINF (NXX field) for NXX (office code) and populates 3 or 6 digit ChargeNumber (NPA or NPA-NXX) when available. It is recommended that the incoming trunk be datafilled in table SSPTKINF when the partial ChargeNumber is desirable and when parameter ChargeNumber is not received from the incoming trunk.

When the charge number, ANI, or calling party number and originating line information (OLI) (for SS7) is not available on trunk-originated calls, the SSP

attempts to use trunk datafill to construct either a 3-digit NPA or 6-digit NPA-NXX value to use as a substitute for parameter ChargeNumber in the query.

When the SSP receives only a partial ANI or a partial charge number on MF trunk-originated calls, the SSP uses datafill where available to perform the following:

- expand a received NPA value from ANI to NPA-NXX in the ChargeNumber
- add a 3-digit NPA value to expand a received 7-digit ANI value to a 10 digit NPA-NXX-XXXX value in the ChargeNumber

The NPA used in the previous cases is taken from the entry in the TRGGRP table that is associated with the originating trunk. Table SSPTKINF is used to provide NXX values for the originating trunk when required.

This behavior applies to the ChargeNumber parameter for both AIN Essentials and AIN Service Enablers calls.

Note: In releases previous to NA008, when information for the charge number was not received from trunk signaling, then the ChargeNumber parameter was left empty in the query.

For MF and ISUP VAPN trunks, the charge number in the outgoing query message is populated with the value of the ANI digits even though a BILLDN is datafilled for these trunks in table TRKGRP.

Parameter ChargeNumber is encoded like the ISDNUP charge number. Parameter ChargeNumber uses the format of parameter AINDigits.

The population of parameter ChargeNumber depends on the types of originating agent. The following list outlines the originating agent types:

- Lines—the ChargeNumber is populated with the special billing number datafilled against the line, through the special billing (SPB) option. When a seven digit SPB number is datafilled, the NPA of the originating facility is used to obtain a ten digit charge number. When the SPB option is not present, the calling DN is used to populate the ChargeNumber.
- MF trunks—The ChargeNumber is populated with the ANI, when it is received. When the ANI is not received and the trunk has the BILLDN datafilled in table TRKGRP, then the BILLDN is used to populate the ChargeNumber.

- PRI trunks—The ChargeNumber is populated with the calling party number (CPN) from the PRI trunk as follows
  - — When a special billing number is datafilled against the trunk in the BILLDN field of table TRKGRP, that special billing number is used to populate the ChargeNumber.
  - — When a default CPN is associated with the LTID of the PRI trunk group in table LTDATA (DN option), that default CPN is used to populate the ChargeNumber.
  - — Otherwise, when the CPN is received from the PRI trunk and the number plan indication (NPI) is PUBLIC (E164 or ISDN number plan) and the digit length of the CPN is 10, then the CPN is used to populate the ChargeNumber.
  - — This is applicable for both IBN PRI and 'PRA' trunk types.
- ISUP trunks—When present, the ISDNUP charge number is used to populate the ChargeNumber.
- When the ISDNUP charge number is not present, the ChargeNumber is populated as follows:
  - — When both the ISDNUP originating_line_information (OLI) and the calling party (CPN) are present, then the CPN is used to populate the ChargeNumber under the following conditions
    - – the CPN NPI is PUBLIC
    - – the digit length of the CPN is 10
  - — When the billing number is associated with the IBN ISUP trunk group in table TRKGRP (BILLDN option) and the billing number is used to populate parameter ChargeNumber.
  - — In case of call redirections, when the redirecting_number in an IAM is present, the redirecting_number is used to populate the ChargeNumber under the following conditions
    - – the NPI of the redirecting_number is PUBLIC (ISDN_Number_Plan)
    - – the digit length of the redirecting_number is 10
  - — Otherwise, when the original_called_number in an IAM is present, the original_called_number is used to populate the ChargeNumber under the following conditions
    - – the NPI of the original_called_number is PUBLIC (ISDN_Number_Plan)
    - – the digit length of the original_called_number is 10

For the trunk originated calls, when a seven digits BILLDN is given, then the NPA of the ChargeNumber parameter can be retrieved in different ways. For example, the NPA can take the first entry in table HNPACONT for a private trunk originated call. In order to avoid the unpredictably of encoding the NPA, it is recommended that a ten digits BILLDN be always given when the BILLDN is used.

Note that the population of the ChargeNumber has important effects on the Global Title Value (GTV) that is used to determine where the corresponding query message is routed. In order to insure a valid Charge Number for routing the query message, it is suggested that the BILLDN in the table TRKGRP be datafilled in the situations when all other candidates can be missing, for example, the ANI information cannot be passed for MF IBNTI and IBNT2 trunks

A new ESN index is derived from the ChargeNumber received in the Forward Call Response by treating the last five digits of the 10 digit Chargenumber

as the new ESN. This eliminates the need for all possible Charge Numbers having to be datafilled in Table E911SRDB.

6.4.4.19.15 ChargePartyStationType parameter Service Enabler uses ANI I to ANI II conversion to populate the ChargePartyStationType message parameter as specified by GR-1298 and GR-2892. See Table 61.

Table 61 CAMA single-digit station identification conversion

Source ANI I code	Converted ANI II Code			Meaning
	ANI II non-coin traffic	ANI II combined traffic	ANI II coin traffic	
0	00	23	27	Non Coin -POTS
1	01	01	27	Multiparty
2	02	23	27	ANI Failure
3	00	23	27	Non Coin-Observed
4	01	01	27	Multiparty-Observed
5	02	23	27	ANI Failure Observed
6	06	06	27	Hotel
7	07	07	27	Coinless, other

Table SSPTKINF can be accessed to decide the type of traffic (non coin, coin or combined).

Parameter ChargePartyStationType is populated in the outgoing query message for all triggers supported by MF and ISUP VAPN trunks. See Table 14 on page 142 for a list of the triggers supported by MF and ISUP VAPN trunks.

6.4.4.19.16 CollectedAddressInfo parameter This parameter contains the address digits collected from the user. The CollectedAddressInfo parameter differs from the CalledPartyID in that the digits have been collected according to the dialling plan but have not yet been "fully translated". "Fully translated" implies that the digits have not yet been screened to verify that they are valid for the user dialling plan.

This parameter is sent when address digits are present and one of the following triggers is detected: the Offhook Delay trigger, the Shared Interoffice trigger, or the CDP trigger. It is also sent when subsequent digit collection is required, and the digit collection algorithm specified is "normal". Subsequent digit collection can be done prior to sending a query or after receiving a conversation package (as a result of a "Send_To_Resource" request).

The values used in populating the CollectedAddressInfo parameter are identical to those already specified in the CalledPartyID parameter with the following exceptions:

- The "Digits" field is for domestic calls is populated with the digits dialled (that is, 7 digits) instead of the PODP number (10 digits).
- For the CDP intercom trigger criteria type, the population of the collected address parameter depends on the value datafilled in field "rprtdigs" in table TRIGDIG. When the "rprtdigs" field contains value "TRANS", then the collected address parameter contains the PODP number. Otherwise, the collected address parameter contains the dialled digits.

For exceptions, see Section 20.3.13 "Parameter CollectedAddressInfo" on page 675.

6.4.4.19.17 CollectedDigits parameter This parameter contains the digits collected from the user. The digits collected correspond or do not correspond to an address; that is, the SSP has not yet analyzed the digits.

The CollectedDigits parameter is sent when the user has dialled an access code or a vertical service code, and subsequent digits were collected using either a fixed or variable digit collection algorithm; that is, the CollectedDigits parameter can be sent in a QUERY package when either an "Offhook Delay" trigger or "CDP" trigger is encountered. This parameter is also sent in a

conversation package containing a “Resource_Clear” message when the SCP or adjunct has previously requested fixed or variable digit collection.

The CollectedDigits parameter uses the AINDigits parameter format. The “Nature of Number” field is set to “not applicable”. The “Numbering Plan” field is set to “unknown or not applicable”. The “Digits” field is populated with 0 to 32 digits in BCD form.

6.4.4.19.18 DisconnectCause

When the SSP detects the O_Disconnect_Called event, the DisconnectCause parameter is populated with the value “farEnd”.

DisconnectCause is not populated in the O_Disconnect EDP-R query message associated with O_Disconnect event.

6.4.4.19.19 GenericAddressList parameter

GenericAddressList parameter is a single parameter that can contain up to five generic addresses. Each generic address contains

- the address type
- nature of address
- odd or even digit count flag
- a presentation indicator
- a numbering plan indicator
- a string of digits

The following generic address types can be set:

- dialed number
- destination number
- completion number

The following generic address types can be set only when they are received as part of a Generic Address List response:

- supplemental user provided calling address (failed screening)
- supplemental user provided calling address (not screened)
- Ported Number
- 800 Service Indicator

Other generic address types, for example, Ported Number or Proprietary 800 Service, are supported for DMS SS7 signaling but are not specified in GR-1299. They are not sent in an AIN query message.

Note: The current implementation of the GenericAddressList parameter does not comply with ISDN requirements for this parameter.

The GAL is populated in the following query messages:

- infoCollected
- infoAnalyzed
- terminationAttempt (TAT)

When an unsupported generic address type is received as part of a Generic Address List, only the unsupported generic address shall be disregarded, other valid generic address types shall be contained in the list.

When the Supplemental User Provided Calling Address types of Generic Addresses are received in an ISUP Initial Address Message (IAM), they are used to populate the GenericAddressList parameter.

For SS7 trunk originating facilities, GenericAddressList is populated for Info_Analyzed, Info_Collected, and Termination_Attempt triggers when the incoming IAM contains one or more Generic Address Parameters (GAP).

Up to five generic addresses are used to populate GenericAddressList and can appear in any order. For each type of address, only one generic address is stored in the DMS. Since there are only five supported types of address, when a generic address is supplied for every type of address, they are all sent to the SCP in the GenericAddressList.

The GenericAddressList parameter is controlled by the same SOC option as for the rest of AIN Service Enablers. When the SOC option is in IDLE state, the GenericAddressList parameter is not available.

This parameter is controlled by SOC option AIN00220.

6.4.4.19.20 Generic Digits List parameter

Cell site and sector information may be signalled in a Generic Digits parameter from the wireless

switch. When available in the incoming ISUP IAM, the Generic Digits Parameter is encoded in the Generic Digits List Parameter as follows:

- The type of digits field in the Generic Digits parameter are coded 01101 (#D) for "location identification number."
- The digits field in the Generic Digits parameter contains the cell site and sector (location) information associated with the calling party. It contains the digits identifying the caller's location in the format *npa+nxx+xxxx*
- The encoding scheme field for the Generic Digits parameter is coded as appropriate.

  Note: The outgoing GDLP (Generic Digits List Parameter) is a list of up to 5 GDPs (Generic Digits Parameter). This feature is responsible for encoding only the Generic Digits Parm of type Location Identification Number (#D) to the outgoing queries.

6.4.4.19.21 LATA parameter The local access and transport area (LATA) is sent by the SSP to the SCP or adjunct. For LATA determination, the SSP must have equal access software and the appropriate equal access tables must be datafilled.

In an equal access end office the LATA used by AIN is determined from the originator's datafill (for example, LINEATTR) in the same manner as regular call processing. Please refer to the appropriate equal access documentation for more details on the tables involved in determining LATA.

In an access tandem switch, the following sequence is followed to determine the LATA used by AIN:

- when a LATA is included in the IAM, it is used
- when a LATA was not sent, table TRKLATA is checked for a LATA associated with the incoming trunk
- when there is no entry in table TRKLATA for AIN toll services (only), table SSPTKINF is checked for a LATA associated with the incoming trunk
- when none of these sources provide a value, the LATA is left blank in subsequent AIN processing

The AINDigits format is used with the following fields:

- nature of number is set to "not applicable."
- numbering plan is set to "unknown or not applicable".
- the digits field contains a LATA of three digits.

The LATA parameter is sent in the following SSP-to-SCP messages:

- Origination_Attempt, Info_Collected, Info_Analyzed, and Network_Busy messages: the LATA of the originating facility is sent when it can be determined. The LATA must be datafilled on the DMS SSP for a LATA to be determined.
- Termination_Attempt message: the LATA of the terminating facility is sent when it can be determined.

6.4.4.19.22 LegID

The LegID parameter contains the numeric value corresponding to the leg of the current call for which the O_Disconnect/O_Disconnect_Called or Timeout is detected. The SSP populates the LegID parameter according to the following table.

Table 62 Population Rules for the LegID parameter

Leg	LegID Value
ControllingLeg	0
PassiveLeg (1)	1
PassiveLeg (2)	2

6.4.4.19.23 NetworkSpecificFacilities parameter The NetworkSpecificFacilities parameter is used exclusively by ISDN Primary Rate Interface (PRI) to implement Call-by-Call services. The Call-by-Call service is a method of requesting and offering services on Customer Premises Equipment without the use of dedicated trunks. The NetworkSpecificFacilities parameter indicates for each call the specific service type required to complete the call. Any B-channel on a PRI trunk can be used to offer provisioned services. In addition to requesting a specific service, the NetworkSpecificFacilities parameter can also request a specific facility (trunk or zone). Currently, Northern Telecom North America PRI (NTNA PRI) and

National ISDN PRI (NIPRI) are the two variants of PRI that support the NetworkSpecificFacilities parameter.

CAUTION
Possible loss of service
North America PRI variants U449PRI and U459PRI do not support parameter NetworkSpecificFacilities.

Table 63 illustrates the structure of the NetworkSpecificFacilities parameter.

Table 63 Structure of NetworkSpecificFacilities parameter

bit 8	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1
length of network identification							
1 ext	type of network identification			network identification plan			
0 spare	network identification						
0/1 ext	1 exp. bit	service /feature	facility coding value				
0 spare	service parameters						

The Length of Network Identification field represents the length, in octets, of the Network Identification value that follows. A length of "0" indicates a local service provider. The Type of Network Identification, the Network Identification plan, and the Network identification fields are not included in the NetworkSpecificFacilities parameter when the Length of Network Identification field is "0".

The Type of Network Identification field is hard coded to indicate that a nationally standardized identification is used.

The Network Identification Plan field is hard coded to indicate that the InterLATA carrier identification is used.

The Network Identification field identifies the Interexchange Carrier (IC) by its Carrier Identification Code (CIC).

The expansion bit is always set to one to indicate that the facility coding value is included in the parameter.

The Service/Feature flag is hard coded to indicate that a service is being requested.

The Facility Coding Value indicates the requested service. The following service types can be used to populate the facility coding value in the AIN NetworkSpecificFacilities parameter:

- INWATS
- OUTWATS
- foreign exchange (FX)
- terminal interface equipment (TIE) trunk
- integrated customer advanced networking (ICAN)
- hotel/motel service
- selective class of call screening (SCOCS)

Currently, NIPRI does not support ICAN.

NTNA PRI does not support ICAN, hotel/motel service, and SCOCS. However, NTNA PRI does support an additional service type: Private. The Private service type is not defined by Bellcore and not supported.

The Service Parameter field can be up to five IA5 characters and indicates the specific facility (trunk or zone) requested. Currently, NTNA PRI and NI PRI support up to four IA5 characters for the service parameter on the DMS SSP.

When the NetworkSpecificFacilities parameter is received in a PRI SETUP message from an originating PRI trunk, and the call encounters an Info_Analyzed trigger, the NetworkSpecificFacilities parameter is sent to the SCP or adjunct as part of the Info_Analyzed query message. A PRI trunk can only encounter the following triggers at the Info_Analyzed TDP:

- specific digit string
- customized dialing plan
- N11

When the NetworkSpecificFacilities parameter is received from an NTNA PRI trunk with a service type of “Private” it is not sent with the Info_Analyzed query.

When an incoming NI PRI or NTNA PRI call with an NSF Information Element is call forwarded intra-switch before encountering the SDS, N11, or CDP trigger, the query message sent to the SCP still contains the NetworkSpecificFacilities parameter.

This parameter is controlled by SOC option AIN00220.

6.4.4.19.24 NotificationIndicator parameter For the event request message, the NotificationIndicator parameter is populated with the value FALSE.

For the event notification message, the NotificationIndicator parameter is populated with the value TRUE.

This parameter is controlled by SOC option AIN00210.

6.4.4.19.25 OriginalCalledPartyID, RedirectingPartyID, and RedirectionInformation parameters

The OriginalCalledPartyID, RedirectingPartyID and RedirectionInformation parameter are available at all TDPs except the Origination_Attempt TDP.

The OriginalCalledPartyID is the initial called party number and contains a 10-digit NANP number. For a non-SS7 originating access, this parameter is coded to the original called party number when the call has undergone AIN redirection at least twice. For OCM redirection (that is, Analyze_Route with redirection information), the original called party number would contain the redirecting party id returned from the database once the call had redirected at least twice. When the initial redirection was due to a Forward_Call, the original called party number would contain the DN assigned the Termination_Attempt trigger.

When the originating access is an SS7 trunk and the initial setup message contains an OriginalCalledNumber parameter, this information is used to populate this parameter.

Parameter Redirecting_Party_ID contains the last redirecting party and contains a 10-digit NANP number. When the call is redirected through AIN in the local office, this parameter is coded to the last redirecting party supplied by AIN. For redirection with an Analyze_Route message, the RedirectingPartyID returned from the database is used to populate this parameter. For AIN redirection with a Forward_Call response, the DN of the Termination_Attempt trigger is used.

The population of the OriginalCalledPartyID and RedirectingPartyID in query messages are affected by tables DNATTRS and DNGRPS for intra-switch calls. The “public suppress” option in table DNATTRS or DNGRPS is used to populated the “Presentation Restriction Indicator” field. The “public address” option in table DNGRPS is used to populate the “Digit” field. See Section 6.4.4.19.11 on page 223 for more information.

When a RedirectingNumber parameter was received in the setup message of an SS7 or PRI trunk and the call was not forwarded at the local office, this parameter is mapped to the AIN RedirectingPartyID parameter.

Note: If SOC option AIN00310 is OFF, or value of office parameter REDIRECTION_FRAMEWORK is N, redirection information that resulted because of SSP based local call forwarding is not supplied to the SCP.

If SOC option AIN00310 is ON and value of office parameter REDIRECTION_FRAMEWORK is Y, redirection information that resulted because of SSP based local call forwarding is supplied to the SCP.

Parameter RedirectingInformation contains the original and redirecting reasons. It can be one of the following:

- unknown
- user busy -- Call Forward Busy (all variations)
- no reply -- Call Forward Don't Answer (all variations)
- unconditional -- Remote Call Forwarding, POTS Call Forwarding, IBN Call Forward Universal, Selective Call Forwarding, and Call Forward Intragroup, AIN Forward Call

Parameter RedirectingInformation also contains a RedirectionCounter subfield. This field is an integer value with a range of 1-10. It includes the SS7 redirection count plus the redirection count from the local switch.

See also Section 6.2.4.1 "Serial triggering and redirection parameters" on page 198.

6.4.4.19.26 PointInCall

The PointInCall (PIC) parameter contains the numeric value corresponding to the PIC from which the O_Disconnect or Timeout was detected according to the BCM described in Section 3 of GR1298. The SSP populates the PointInCall parameter according to the following table.

Table 64 Population Rules for the PointInCall parameter

PIC Name	PointInCall
O_Active	9
O_Suspended	10
T_Active	16
T_Suspended	17

6.4.4.19.27 Primary carrier parameter The Primary Carrier parameter is populated in the Origination_Attempt, Info_Collected, Info_Analyzed, Network_Busy, O_Called_Party_Busy, and O_No_Answer AIN query messages.

At the Origination_Attempt TDP, where the Off-hook_Immediate trigger is encountered, the Primary Carrier parameter (for an inter-LATA or intra-LATA call) is populated in the AIN query to the SCP with the primary inter-LATA carrier. This applies for both POTS and IBN originated calls. If no inter-LATA carrier is subscribed to by the user, then the office default inter-LATA carrier is used.

At the Info_Collected TDP, the Primary Carrier parameter is populated where the following triggers is encountered: Off-Hook_Delay, Channel_Setup_PRI, and Shared_Interoffice_Trunk.

At the Off-Hook_Delay trigger detection points the PrimaryCarrier parameter for an inter-LATA or intra-LATA call is populated in the AIN query to the SCP with the user dialed inter-LATA carrier identification code. This applies to both POTS and IBN originated calls. If no carrier is dialed, then the user's primary inter-LATA carrier is used.

At the SharedInterOffice trigger, the local exchange carrier (LEC) is used to populate the PrimaryCarrier. The LEC is also used at the N11 trigger to populate the PrimaryCarrier if the user does not specify a carrier by casual dialing. Otherwise, the carrier access code (CAC) is populated as the PrimaryCarrier.

At the Info_Analyzed TDP, the Primary Carrier parameter is populated where the following triggers is encountered: BRI_Feature_Activation_Indicator, PRI_Network_Services, Public_Feature_Code, Specific_Feature_Code, Customized_Dialing_Plan, Specific_Digit_String, One_Plus_Prefix, Specified_Carrier, International, Operator_Services, and N11. AIN handling of the PrimaryCarrier parameter at the Info_Analyzed TDP is discussed in Section 6.4.4.19.27 "Primary carrier parameter" on page 240.

When a public feature code is dialed, the PrimaryCarrier parameter is only sent if a carrier is specified using 10XXX or 101XXXX during subsequent digit collection. Neither PIC nor LPIC is ever used to populate the PrimaryCarrier.

At the CDP trigger, the LEC is always used to populate the PrimaryCarrier except when the call triggers on a public network access code and the caller initiates an IEC call. In this case, the PrimaryCarrier is populated with the carrier which usually services the call.

The Primary Carrier parameter is populated in the Network_Busy message when the AFR trigger is encountered. If the AFR trigger is hit on a private

route, LEC is always used to populate the PrimaryCarrier. For public-trunk-originating calls hitting AFR, the PrimaryCarrier is only populated for FGD signaling calls with the carrier it was using before the call processing arrived at the AFR trigger. Otherwise, the LEC is used to populate the PrimaryCarrier.

The Primary Carrier parameter is populated in the O_Called_Party_Busy and O_No_Answer messages have the same behavior of the Info_Analyzed message.

For the PIC and LPIC features, if a call should be routed over an office default carrier, and no office default carrier exists, then the call is sent to treatment as determined by the office parameter DEFAULT_CARRIER_OR_TREAT.

The PrimaryCarrier parameter is not populated in the query message at the Termination_Attempt trigger detection point.

6.4.4.19.28 Subsequent call routing Following a Continue response from the SCP, the PrimaryCarrier is determined at the Analyze Information PIC before any triggers are used in the call. This applies to both the IEC and the LEC.

Following an Analyze_Route or Forward_Call response from the SCP processing a call that originates from a line or private trunk, the carrier(s) specified in the SCP response attempt to carry the call. However, when the carrier identified by the SCP cannot handle that particular call, then the call is routed to treatment. For example, when the CalledPartyID corresponds to an INTRALATA call, but the carrier supplied is an INTERLATA-only carrier or the other way around.

6.4.4.19.29 Billing records For line or private-trunk originating calls, a billing record with call code 110 is generated whether or not an AMASLPID is specified by the SCP. However, note that for the SDS trigger, when a user dials a Carrier Access Code (CAC) and the call triggers on the digits 10XXX + 10 digits, where the 10 digits matches a SDS triggering pattern and the SCP response specifies another carrier, two 110 records can be generated since there is a requirement for the SDS trigger to generate billing records as two different call legs.

For public-trunk originated calls, billing records with call code 110 is only generated when an AMASLPID is included in the response.

6.4.4.19.30 Primary inter-LATA carrier The Primary Inter-LATA Carrier (PIC) feature allows subscribers to specify the preferred carrier for handling interLATA calls as well as whether or not casual dialing (for example 10XXX+) to other carriers is permitted.

For PICs, Table 65 illustrates parameter PrimaryCarrier population at the Info_Analyzed TDP, for query processing of inter-LATA calls.

Table 65 PrimaryCarrier parameter population (inter-LATA)

Call type (inter-LATA/local)	User presubscription status (yes/no/irrelevant)	User dialed inter-LATA carrier (yes/no)	Carrier population
local	irrelevant	no	local exchange carrier
inter-LATA	yes	no	Primary Inter-LATA Carrier
inter-LATA	no	no	office default carrier
inter-LATA	irrelevant	yes	user dialed carrier

Table 66 illustrates parameter PrimaryCarrier population for the Off_Hook_Delay trigger.

Table 66 PrimaryCarrier parameter for the Off_Hook_Delay trigger

Call type (inter-LATA/local)	User pre subscription status (yes/no/irrelevant)		User dialed inter-LATA carrier (yes/no)	Carrier population
	Triggering agent is presubscribed to a PIC	EA PIC option datafilled on customer group IBN translator (yes/no/irrelevant)		
local	no	irrelevant	no	office default carrier
local	yes	irrelevant	no	Primary Inter-LATA carrier of triggering agent
inter-LATA	yes	irrelevant	no	Primary Inter-LATA Carrier of triggering agent
inter-LATA	no	yes	no	Primary Inter-LATA Carrier from IBN translator
inter-LATA	no	no	no	office default carrier
Inter-LATA	irrelevant	irrelevant	yes	user dialed carrier

Note: Office default carrier is defined in tuple Default_Carrier_Or_Treat under table OFCENG. When the Carrier parameter is to be populated with the office default carrier and no office default carrier exists, the no Carrier parameter will be sent in the query.

Table 67 on page 243 illustrates the functionality of the use of the default carrier digit with AIN response processing for inter-LATA calls.

Table 67 Response processing of carrier (inter-LATA)

Call type (inter-LATA/local)	User-input carrier (INTER/ INTRA/ none)	User presubscription status (yes/no/irrelevant)	Carrier used
local	irrelevant	irrelevant	none
inter-LATA	none	yes	user's primary inter-LATA carrier
inter-LATA	none	no	office default carrier (Note)
inter-LATA	inter	irrelevant	user-specified carrier
inter-LATA	intra	yes	user's primary inter-LATA carrier
inter-LATA	intra	no	office default carrier
Note: Office default carrier is defined in tuple Default_Carrier_Or_Treat under table OFCENG			

The carrier access code dialed by the user or the carrier information, when it was received on a previous database response, is discarded when an Analyze_Route response is received from the database.

> ***Note:*** This functionality can cause looping to occur at trigger Automatic_Flexible_Routing (AFR). That is, when the call is inter-LATA and all the ATC or IT trunks for that primary inter-LATA carrier are busy, then the call encounters the AFR trigger, when subscribed to. When the SCP sends an Analyze Route response without specifying any RouteID or Carrier, then the call can try the same ATC trunk group again and encounter AFR again. This looping goes on until the maximum number of serial triggers is reached. The call is then sent to AINF treatment.

Calls that return a CalledPartyID parameter with the Nature of Number field set to "950+ Call" are considered InterLATA calls to the interexchange carriers.

950 calls are not affected by the PIC feature and are allowed to complete to the specified carrier independent of the PIC carrier and casual dialing restrictions.

6.4.4.19.31 Primary intra-LATA carrier

For primary intra-LATA carrier (LPIC), Table 68 illustrates parameter PrimaryCarrier population at the Info_Analyzed TDP for query processing of intra-LATA calls.

Table 68 PrimaryCarrier parameter population (intra-LATA)

Call type (intra-LATA/local)	User presubscription status (yes/no/irrelevant)	User dialed intra-LATA carrier (yes/no)	Carrier population
local	irrelevant	no	local exchange carrier
intra-LATA	yes	no	primary intra-LATA carrier
intra-LATA	no	yes	user dialed carrier
intra-LATA	no	no	local exchange carrier

Table 69 illustrates the use of default carrier digits with AIN response processing for intra-LATA calls.

Table 69 Response processing of carrier (intra-LATA)

Call type (intra-LATA/local)	User-input carrier (inter/ intra/ none)	User presubscription status (yes/no/irrelevant)	Carrier used
local	irrelevant	irrelevant	none
intra-LATA	none	yes	user's primary intra-LATA carrier
intra-LATA	none	no	local exchange carrier
intra-LATA	inter	yes	user's primary intra-LATA carrier
intra-LATA	inter	no	local exchange carrier
intra-LATA	intra	irrelevant	user-specified carrier

The carrier access code dialed by the user or the carrier information, when it was received on a previous database response, is discarded when the Analyze_Route response is received from the database.

Note: This functionality can cause looping to occur at the Automatic_Flexible_Routing (AFR) trigger. That is, when the call is intra-LATA and all the ATC or IT trunks for that carrier are busy, then the call encounters the AFR trigger, when subscribed to. When the SCP sends an Analyze Route response without specifying any RouteID or Carrier, then the call can try the same ATC or IT trunk group again and encounter AFR again. This looping goes on until the maximum number of serial triggers is reached. The call is then sent to AINF treatment.

6.4.4.19.32 Prefix Parameter Prefix is available at the Info_Analyzed TDP. The function of parameter Prefix is to indicate to the SCP that "1+" type of call has been encountered on the SSP. Parameter Prefix is available at the Info_Collected, Info_Analyzed, Network_Busy, O_Called_Party_Busy, and O_No_Answer trigger detection point (TDP).

The following triggers can send parameter Prefix as part of the query to the SCP:

- Off_Hook_Delay
- Public_Feature_Code
- Specific_Feature_Code
- Customized_Dialing_Plan
- Specified_Carrier
- One_Plus_Prefix
- International
- Operator_Services
- Specific_Digit_String
- N11
- Automatic_Flexible_Routing
- O_Called_Party_Busy
- O_No_Answer

When parameter Prefix is sent in a query to the SCP, and a Continue response is returned, parameter Prefix is automatically propagated on any subsequent trigger query while on the same SSP. Parameter Prefix is not populated for NEL queries.

6.4.4.19.33 STRConnection parameter Parameter STRConnection indicates whether or not the reported message originated with a Send_To_Resource message.

6.4.4.19.34 TCM parameter Parameter terminating call model (TCM) contains the traveling class mark for the user. Parameter TCM is sent when a TCM query is received by the SSP (for trunks).

Note 1: Parameter TCM is supported for the Info_Analyzed message. See Table 41 on page 204.

Note 2: Parameter TCM is supported for the Prefix triggers (Specified_Carrier, One_Plus_Prefix, International, and Operator_Services). These Prefix triggers are an NA011 activity.

Note 3: Parameter TCM is supported in Termination attempt messages for the TKTERM trigger.

The AINDigits format is used with the following fields:

- nature of number is set to “not applicable.”
- numbering plan is set to “unknown or not applicable”.
- the digits field contains a TCM of up to two digits inclusive.

Parameter TCM is sent in the following SSP-to-SCP messages: Info_Collected, Info_Analyzed, and Network_Busy messages for private facilities, when the originating facility has received a travelling class mark.

Note: When the SCP returns a TCM to the SSP, this value is used in subsequent queries.

For exceptions, see Section 20.3.22 “Parameter TCM” on page 680.

6.4.4.19.35 TriggerCriteriaType parameter This parameter indicates the type of event that caused a trigger to occur. For triggers involving digit criteria, the trigger encountered is determined by the individual, group and office subscription data. This is an optional parameter in every Query message to the SCP or adjunct and is coded as shown in Table 70.:

Table 70 Trigger to TriggerCriteriaType mapping

Encountered trigger	TriggerCriteriaType
Off-Hook_Immediate	Offhook Immediate
Off-Hook_Delay	Offhook Delay
Shared_Interoffice_Trunk	SharedIOFTrunk
Specified_Carrier	specifiedCarrier
One_Plus_Prefix	onePlus
International	International
Operator_Services	zeroPlus or zeroMinus
3-Digit SDS	NPA
4-Digit SDS	NPAN
5-Digit SDS	NPANX
6-Digit SDS	NPANXX

Table 70 Trigger to TriggerCriteriaType mapping (Continued)

Encountered trigger	TriggerCriteriaType
7-Digit SDS	NPANXXX
8-Digit SDS	NPANXXXX
9-Digit SDS	NPANXXXXX
10-Digit SDS	NPANXXXXXX
N11	N11
CDP access code	Customized Access
CDP intercom code	Customized Intercom
AFR	AFR
Termination_Attempt	Termination Attempt
O_Called_Party_Busy	O_Called_Party_Busy
O_No_Answer	O_No_Answer
T_Busy	T_Busy
T_No_Answer	T_No_Answer
Trunk Group trigger	tkterm

6.4.4.19.36 UserID parameter

The UserID parameter in the event request or notification message contains the same value that was sent with the trigger request that initiated the transaction. The DMS SSP is partially compliant with the request population of the UserID parameter. The DMS SSP does not support use of the ISDN identifier (ISDNI) that is, the DMS SSP populates the DN instead of ISDNI for a BRI interface. This is equivalent to the AIN Essentials UserID parameter.

The UserID parameter matches the data contained in the trigger request even when serial triggering occurs and modifies the called or calling number as specified in GR-1298.

This parameter contains the identity of the originating facility. In situations where triggering occurs at or after the termination attempt trigger (that is, after a Forward_Call response message), the originating facility is the subscriber of the termination attempt trigger.

The values or tags supported for the UserID parameter are as follows:

- [1] IMPLICIT DN
- [5] IMPLICIT TrunkGroupID
- [6] IMPLICIT PrivateFacilityGID

All other values are currently not supported; thus, the DMS SSP classifies the user as one of the above, even though the user can have characteristics that differentiate it from other facilities. The UserID parameter for a line in a hunt group is "[1] IMPLICIT DN" instead of "[7] IMPLICIT Mlhg".

Dependent upon the classification of the user, certain data must be sent to the SCP or adjunct:

- **DN**
  - The UserID parameter contains the DN of the originating line or PRI for all originating triggers. The termination DN is used to populate the UserID parameter where a terminating trigger has been encountered. This parameter always contains the calling party number of the facility and not its billing number.
  - The DN is 10 digits, encoded in BCD.
  - For PRI trunks the DN is derived from the Calling Party Number (CPN). The CPN is derived as follows:
    - When the received CPN Numbering Plan Indicator (NPI) is PUBLIC and 10 digits in length then it is used to populate the USERID parameter.
    - Otherwise the default CPN associated with the trunk group is taken from the table LTDATA (DN option) and used to build the USERID.
    - USERID is a mandatory query parameter. Therefore, failure to derive a CPN for building the USERID parameter results in the call be sent to AINF treatment.
- **TrunkGroupID**

  The TrunkGroupID is populated with the contents of the "Adnum" field in table CLLI, corresponding to the public trunk's name.
- **PrivateFacilityGID**

  The PrivateFacilityGID is populated with the contents of the "Adnum" field in table CLLI, corresponding to the private trunk's name.

For exceptions, see Section 20.3.24 "Parameter UserID" on page 680.

6.4.4.19.37 GenericName parameter

The GenericName parameter is based on the ISDNUP Generic Name (GN) parameter and contains the following field values:

- Presentation
- Availability
- Type of name

The GenericName is populated in the following TDP-R query messages:

- TerminationAttempt (TAT)
- Busy
- NoAnswer (TNOA)
- TermResourceAvailable

The GenericName is populated in these TDP-R queries when:

- It is received in an ISUP IAM message
- If a calling party has invoked either Calling Name Delivery Blocking (CNAB) or Calling Identity Delivery and Suppression (CIDS)
- If the calling party has subscribed for the SUPPRESS option with NAME suppressed
- It is received in an SCP Response message

The Presentation field of GenericName is set as PresentationRestricted if calling party has subscribed for the SUPPRESS option with NAME suppressed. If CNAB is activated then the Presentation field of GenericName is set as BlockingToggle.

The GenericName parameter is controlled by the same SOC option as the rest of AIN Service Enablers. When the SOC option is in the idle state, the GenericName parameter is not available.

The GenericName parameter is controlled by SOC option AIN00220.

6.4.5 Non call-related message processing

This function provides the SSP with transaction and component level procedures for sending non call-related messages. The non call-related messages can be sent in both non call-related transactions and call-related transactions.

See Section 20.3 “Messaging and parameter limitations” on page 671 for limitations associated with messaging.

All AIN Service Enablers message parameters are the same or a superset of the equivalent AIN Essentials message parameters. In the following message parameter tables:

- The parameters are listed alphabetically, not in the order listed in the ASN.1 format of the message.
- Optional parameters have a capital O in parentheses at the end of their name.
- Mandatory parameters have a capital M in parentheses at the end of their name.

6.4.5.1 ACG message

Table 71 lists the parameters that make up the ACG message.

Table 71 ACG message parameters

Parameter	Description
ControlCauseIndicator (M)	See Section 6.4.5.5.1 on page 252.
ExtensionParameter (O)	
GapDuration (M)	See Section 6.4.5.5.2 on page 253.
GapInterval (M)	See Section 6.4.5.5.3 on page 254.
GlobalTitleAddress (M)	See Section 6.4.5.5.4 on page 255.
TranslationType (M)	See Section 6.4.4.19.7 on page 221.
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.4.5.2 ACG_Overflow message

Table 72 lists the parameters that make up the ACG_Overflow message.

Table 72 ACG_Overflow message parameters

Parameter	Description
ControlCauseIndicator (M)	See Section 6.4.5.5.1 on page 252.
ExtensionParameter (O)	
GlobalTitleAddress (M)	See Section 6.4.5.5.4 on page 255.
TranslationType (M)	See Section 6.4.4.19.7 on page 221.
(M): Mandatory parameter (O): Optional parameter	

Table 72 ACG_Overflow message parameters (Continued)

Parameter	Description
Note: Parameters in shaded areas are not supported in this message for this release.	

6.4.5.3 ACG_Global_Ctrl_Restore message

Table 73 lists the parameters that make up the ACG_Global_Ctrl_Restore message.

Table 73 ACG_Global_Ctrl_Restore message parameters

Parameter	Description
ACGGlobalOverride (M)	Functionality inherited from AIN Essentials.
ExtensionParameter (O)	
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.4.5.4 ACG_Global_Ctrl_Restore_Success message

The ACG_Global_Ctrl_Restore_Success message is supported but its parameters are not.

6.4.5.5 Non call-related parameters

All AIN Service Enablers message parameters are the same or a superset of the equivalent AIN Essentials message parameters.

See Section 20.3 “Messaging and parameter limitations” on page 671 for limitations associated with parameters.

6.4.5.5.1 ControlCauseIndicator parameter While decoding the ControlCauseIndicator parameter, the following are checked:

- The length of the parameter does not exceed the maximum for this parameter type (1 octet)
- The Number of Digits are one of
  - Spare (000000)
  - *1-digit control (000001)*
  - *2-digit control (000010)*
  - 3-digit control (000011)
  - *4-digit control (000100)*
  - 5-digit control (000101)
  - 6-digit control (000110)
  - 7-digit control (000111)
  - 8-digit control (001000)
  - 9-digit control (001001)
  - 10-digit control (001010)

The italicized values are not applicable to AIN Service Enablers, but are allowed by the AIN messaging software. It is the responsibility of the non call-related ACG application to determine the circumstances when this value in this parameter is incorrect.

Any error is reported as an erroneous data value fatal application error.

No checking is performed for the SCP overload controls indicator or the SMS initiated controls indicator.

6.4.5.5.2 GapDuration parameter While decoding the GapDuration parameter, the following are checked:

- The length of the parameter is not zero
- The following represent values of the GapDuration parameter
  - no1Second (1)
  - no2Seconds (2)
  - no4Seconds (3)
  - no8Seconds (4)
  - no16Seconds (5)
  - no32Seconds (6)
  - no64Seconds (7)
  - no128Seconds (8)
  - no256Seconds (9)
  - no512Seconds (10)
  - no1024Seconds (11)
  - no2048Seconds (12)
  - infinity (13)

6.4.5.5.3 GapInterval parameter While decoding the National GapInterval parameter, the following are checked:

- The length of the parameter is not zero
- The following represent values of the GapInterval parameter
  - removeGapControl (0)
  - no0Seconds (1)
  - *no010Seconds (2)*
  - *no025Seconds (3)*
  - *no050Seconds (4)*
  - no1Second (5)
  - no2Seconds (6)
  - no5Seconds (7)
  - no10Seconds (8)
  - no15Seconds (9)
  - no30Seconds (10)
  - no60Seconds (11)
  - no120Seconds (12)
  - no300Seconds (13)
  - no600Seconds (14)
  - stopAllCalls (15)

The italicized values are allowed by AIN messaging software but are not expected to be used in AIN Service Enablers.

While decoding the Private GapInterval parameter, the following are checked:

- The length of the parameter is not zero
- The following represent values of the GapInterval is parameter
  - *no0Seconds (0)*
  - no3Seconds (1)
  - no6Seconds (3)
  - no4econds (2)
  - no8Second (4)
  - no11Seconds (5)
  - no16Seconds (6)
  - no30Seconds (8)
  - no22Seconds (7)
  - no42Seconds (9)
  - no58Seconds (10)
  - no81Seconds (11)
  - no112Seconds (12)
  - no156Seconds (13)
  - no217Seconds (14)
  - no300Seconds (15)
  - stopAllCalls (16)

The italicized value is allowed by AIN messaging software but causes an error in the ACG non call-related application, when present.

Any error is reported as an erroneous data value fatal application error.

6.4.5.5.4 GlobalTitleAddress parameter While decoding the GlobalTitleAddress parameter (previously called the GlobalTitleValue parameter), the following is checked:

The length of the parameter is not equal to the maximum length allowed for this parameter (5 octets).

Any error is reported as an Erroneous Data Value fatal application error.

6.4.5.5.5 TranslationType parameter While decoding the TranslationType parameter, the following are checked:

- The length of the parameter is not zero
- The following represent values of the TranslationType parameter
  - 1-31 Internetwork applications,
  - 223-252 Network specific applications,
  - 253 Internetwork applications,
  - 254 Network specific applications.

Any error is reported as an Erroneous Data Value fatal application error.

6.4.6 User abandon message procedures

The SSP can detect user abandonment of a call during any of the following situations:

The T1 timer is running (that is, the SSP is waiting for a response from the SCP) and no caller interaction is taking place as a result of a Send_To_Resource operation.

The T1 timer is running and caller interaction is taking place as a result of a Send_To_Resource operation.

The SSP is processing a call with no open communication with the SCP.

In such cases, the SSP follows the procedures outlined in Section 4.5.6 of 1298-CORE.

6.5 Generic SSP response message processing

This section describes the implementation of the Generic SCP Message Processing FSS.

The following sections describe the generic SSP functionality that is required to interpret messages from the SCP or adjunct.

6.5.1 Abstract syntax and TCAP structure

This function provides the transfer syntax notation that is transmitted over the SSP to the SCP or its adjunct interface.

6.5.2 General SCCP procedure

This function provides low level generic SSP functionality to send and receive Unit Data (UDT) messages, message segmentation, and SCCP parameter population.

SCCP message segmentation provides a mechanism whereby an increased amount of TCAP data can be passed between the SSP and SCP. This is achieved by splitting or segmenting the SCCP Extended Unit Data (XUDT) messages into smaller more manageable segments, sending them, and reassembling them at the receiving end. The segmenting mechanism itself is transparent to AIN.

Prior to NA009, AIN software only processed TCAP UDT messages up to 256 bytes. Starting in NA009, AIN software processes TCAP XUDT messages up to 610 bytes. Message to the SSP must not exceed 610 bytes in size, otherwise the SSP detects the following error: Fatal Protocol Error, Badly Structured Transaction Portion. This error is handled according to Abnormal Procedures as described in GR-1299. See Section 19.1.1 “Protocol errors” on page 647.

Note: With SCCP segmentation, incoming AIN messages can be up to 1024 bytes long. However, all planned GR-1299 messages are less than the maximum supported message size of 610 bytes. The limit of 610 bytes is applied to minimize processor time and memory waste.

6.5.3 SCCP procedure for SCP initial message

This function provides the procedures for sending messages to the SSP that correspond to SCP-originated transactions and Unidirectional Packages that are not related to an existing transaction.

6.5.4 SCCP procedure for SCP subsequent message

This function provides the procedures for sending messages to the SSP that are related to a particular transaction. These messages are sent only after an SSP Initial Message or an SCP Initial Message has been sent across the interface.

6.5.5 TCAP structure package

This function provides low level, generic procedures for using ANSI TCAP Package Types, Component Types, Transaction IDs, and Component IDs.

6.6 Call-related response message processing

This function provides transaction and component level procedures for sending call related messages to the SCP. As well, this function provides the SSP with procedures for call-related messages from the DSP.

AIN Service Enablers supports AIN Essentials messages version GR-1299 in addition to GR-1299 messages that do not exist in TR-1285.

See Section 20.3 “Messaging and parameter limitations” on page 671 for limitations associated with messaging.

In the following message parameter tables:

- The parameters are listed alphabetically, not in the order listed in the ASN.1 format of the message.
- Optional parameters have an upper case O in parentheses at the end of their name.
- Mandatory parameters have an upper case M in parentheses at the end of their name.

6.6.1 Analyze_Route message

The Analyze_Route response message can be received in response to any trigger except trigger Termination_Attempt. This message instructs the SSP to terminate on a specified address. Addresses can be presented in the following forms:

- routing list (up to 3 routing lists can be specified)
- carrier (up to 3 carriers can be specified)
- called party number (must be specified when routing list and carrier are not present)

It is possible for the SSP to receive an Analyze_Route response that includes one or more routing lists, one or more carriers, and a called party number. In this situation, the SSP first attempts to route the call over one of the route lists. When all route lists are busy, the SSP attempts to route the call over one of the carriers. When all the carriers are busy, the SSP attempts to terminate the call on the called party number.

When the Analyze_Route response contains one or more routing lists, call processing resumes at the Selecting Route point in call. However, when the originator is a CELL, PX, or P2, only the first address is attempted. When the SSP attempts to route the call over a route list that is busy, then, depending upon other information contained in the message, the SSP does one of the following:

- route the call over the next address in the message
- route the call to treatment

When the address is in the form of a carrier, call processing resumes at the Analyze_Info point in call. As the call proceeds to the Selecting Route point in call it encounters the Info_Analyzed TDP. The call skips this TDP when the carrier specified is an interexchange carrier. When the SSP attempts to route the call over a carrier that is busy, the call tries to terminate on the next carrier. When all carriers are busy, the call is routed to treatment.

When the SSP attempts to terminate the call to the called party number contained in the Analyze_Route message, call processing resumes at the Analyzing Information point in call.

When an Analyze_Route response is received with no carrier specified, that is, without a PrimaryCarrier, AlternateCarrier or SecondAlternateCarrier parameter, and with no trunk group information specified, the SSP attempts to select a carrier to route the call.

The carrier dialed by the user or the carrier returned in a previous Analyze_Route response, whichever occurred last, is known as the AIN default carrier. When more than one carrier is specified in the previous Analyze_Route response, the carrier that is used to route the call before triggering is used as the AIN default carrier. Any carrier information that is signaled from a non PRI trunk is not used as the AIN default carrier regardless of whether the carrier information is the result of a user dialed CAC or a carrier returned in an Analyze_Route response from a previous switch. When carrier information is included in the SETUP message from a PRI trunk, either by being included in the CalledPartyID IE or the TNS IE, then the carrier is used as the AIN default carrier.

When an Analyze_Route response without a carrier is returned, the SSP uses the AIN default carrier to route the call regardless of calltype, including a carrier cut-thru call. When the AIN default carrier cannot handle the traffic (for example, the user dialed carrier can only handle INTERLATA traffic whereas the call routing specified by the current SCP or adjunct Analyze_Route response requires an INTRALATA carrier), the call is sent to treatment.

When the AIN default carrier does not contain a carrier, that is, the user has not dialed a CAC and no carrier has been returned in a previous Analyze_Route response, and when the call is not a local call, the call is routed using the user's pre-subscribed carrier (either primary interexchange carrier or local primary interexchange carrier, depending on the nature of the call). When the user does not have a pre-subscribed carrier, the office default carrier (specified by entry Default_Carrier_Or_Treat in table OFCENG) is used to route INTERLATA traffic while the regional bell operating company (RBOC) is responsible to route the INTRALATA traffic.

The AIN default carrier is not used in the following cases:

- when the Analyze_Route response is due to an SDS trigger with associated line attributes (for example, the SDS trigger has a primary interexchange carrier or local primary interexchange carrier assigned)
- the Analyze_Route response is due to a O_No_Answer trigger/event or a O_Called_Party_Busy trigger/event

- the Analyze_Route response is due to an AIN toll free service trigger
- a Collect_Info message is returned from the SCP after the user has dialed a CAC or after the last Analyze_Route message

When the carrier identified by the SCP cannot handle that particular call, then the call is routed to treatment. For example, when the CalledPartyID corresponds to an INTRALATA call, but the carrier supplied is an INTERLATA-only carrier or the other way around

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When an Analyze_Route response message returns a CalledPartyID that corresponds to a toll-free service number or a N11 number, the AIN default carrier is used to route the number. To avoid routing using the AIN default carrier, a 0110 carrier should be returned in the Analyze_Route message.

AR Carrier selection functionality can cause looping to occur at the Automatic_Flexible_Routing (AFR) trigger. That is, when the call is inter-LATA and all the ATC or IT trunks for that primary inter-LATA carrier are busy, then the call encounters the AFR trigger, when subscribed to. When the SCP sends an Analyze Route response without specifying any RouteID or Carrier, then the call can try the same ATC trunk group again and encounter AFR again. This looping goes on until the maximum number of serial triggers is reached. The call is then sent to AINF treatment.

Calls that return a CalledPartyID parameter with the Nature of Number field set to “950+ Call” are considered InterLATA calls to the interexchange carriers.

950 calls are not affected by the PIC feature and are allowed to complete to the specified carrier independent of the PIC carrier and casual dialing restrictions.

Figure 5 “Analyze_Route carrier selection” on page 261 illustrates carrier selection precedence for scenarios where the AIN default carrier can be selected.

Figure 5 Analyze_Route carrier selection

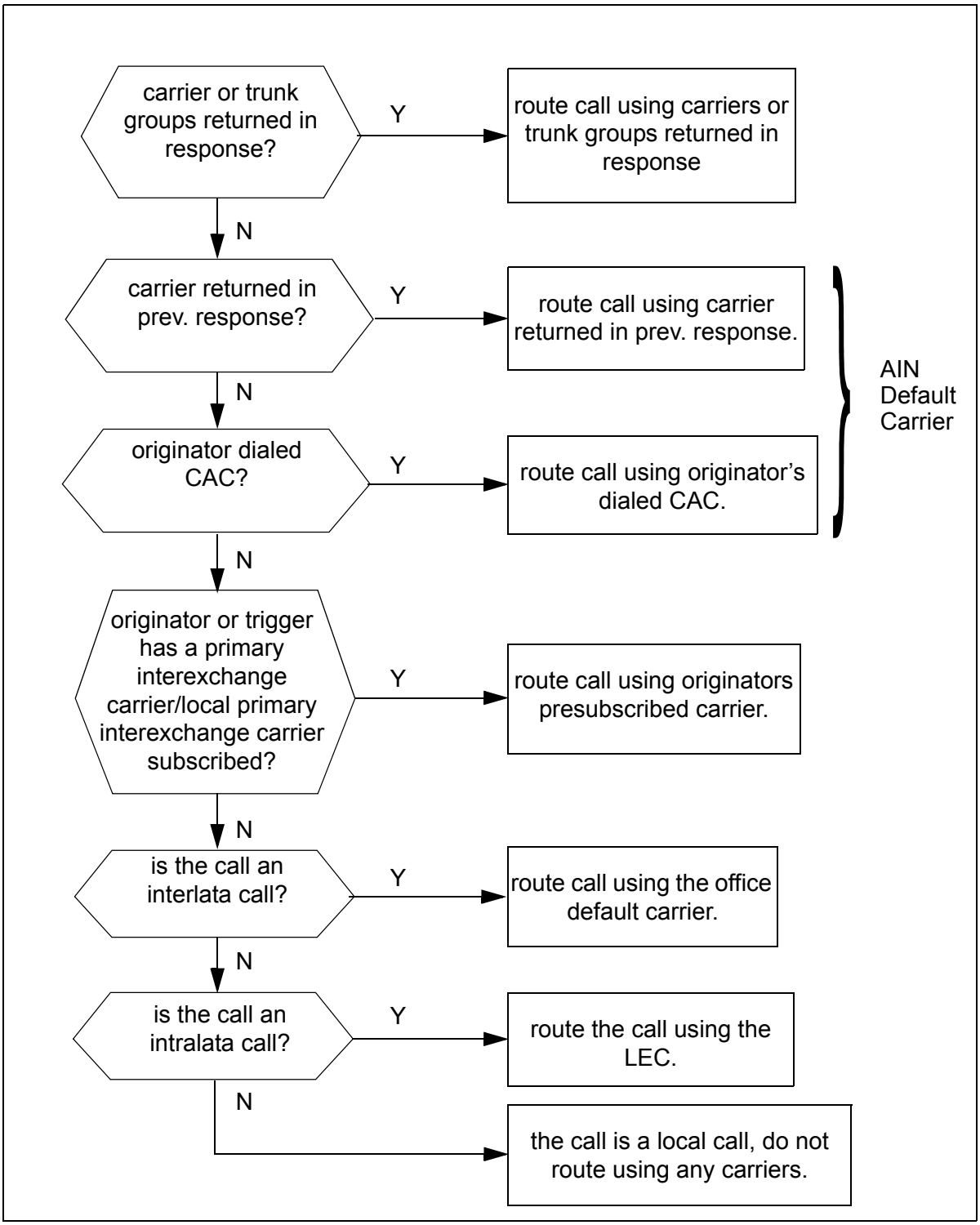


Table 74 lists the parameters that make up the Analyze_Route message.

Table 74 Analyze_Route message parameters

Parameter	Description
AlternateBillingIndicator (O)	Functionality inherited from AIN Essentials.
AlternateCarrier (O)	See Section 6.6.13.6 on page 302.
AlternateTrunkGroup (O)	See Section 6.6.13.1 on page 294.
AMAAlternateBillingNumber (O)	Functionality inherited from AIN Essentials.
AMABillingFeature (O)	
AMABusinessCustomerID (O)	Functionality inherited from AIN Essentials.
AMADigitsDialedWC (up to 5) (O)	Functionality inherited from AIN Essentials.
AMALineNumber (up to 2) (O)	Functionality inherited from AIN Essentials.
AMASequenceNumber (O)	
AMAServiceProviderID	
AMAslpID (O)	Functionality inherited from AIN Essentials.
Amp1 (O)	
Amp2 (O)	
CalledPartyID (O)	See Section 6.6.13.3 on page 295.
CallingPartyID (O)	See Section 6.6.13.5 on page 299.
CallingPartyBGID (O)	See Section 6.6.13.4 on page 296.
Carrier (O)	See Section 6.6.13.6 on page 302.
CarrierUsage (O)	See Section 6.6.13.7 on page 303.
ChargeNumber (O)	See Section 6.6.13.8 on page 303.
ChargePartyStationType (O)	See Section 6.6.13.9 on page 304.
ExtensionParameter (O)	See Section 6.6.1.7 on page 266
ForwardCallIndicator	See Section 6.6.13.17 on page 319.
GenericAddressList (O)	See Section 6.6.13.18 on page 320.
GenericName (O)	See Section 6.6.13.28 on page 327.
OutpulseNumber (O)	See Section 6.6.13.20 on page 322.

Table 74 Analyze_Route message parameters (Continued)

Parameter	Description
OverflowBillingIndicator (O)	Functionality inherited from AIN Essentials.
Prefix (O)	See Section 6.4.4.19.32 on page 245.
NetworkSpecificFacilities (O)	See Section 6.6.13.25 on page 326.
PassiveLegTreatment (O)	Functionality inherited from AIN Essentials.
PrimaryBillingIndicator (O)	Functionality inherited from AIN Essentials.
PrimaryTrunkGroup (O)	See Section 6.6.13.22 on page 325.
RedirectingPartyID (O)	See Section 6.6.13.23 on page 325.
RedirectionInformation (O)	See Section 6.4.4.19.21 on page 234.
SecondAlternateBillingIndicator (O)	Functionality inherited from AIN Essentials.
SecondAlternateCarrier (O)	See Section 6.6.13.6 on page 302.
SecondAlternateTrunkGroup (O)	See Section 6.6.13.26 on page 326.
ServiceContext (O)	
ServiceProviderID (O)	
Tcm (O)	
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

When the SSP receives an Analyze_Route message with a protocol error in either the ChargeNumber parameter or the ChargePartyStationType, both parameters are ignored.

The RedirectingPartyID parameter in an Analyze_Route response message causes the call to be treated as a redirected call. When the RedirectingPartyID parameter is not received in an Analyze_Route message, the call is not treated as a redirection. The SSP considers it a nonfatal error when it receives an Analyze_Route message with a RedirectionInformation parameter without a RedirectingPartyID. The RedirectionInformation parameter is then discarded, and normal call processing continues.

A call that receives an Analyze_Route in response to an SDS trigger, where the SDS digits have a profile datafilled in table PODPATTR for a trigger group or a LARP option datafilled for a trigger item, is treated as a redirected call. When

no RedirectingPartyID is received in the response, the SDS digits are used as the redirecting party. When no RedirectionInformation parameter is received in the response, a redirecting reason set to "unconditional" is used and redirection counter increments by one.

Whenever the Analyze_Route or Forward Call response causes the call to be treated as a redirected call, the DMS-100 switch redirection counter increments. (The DMS redirection counter represents the cumulative number of switch-based redirections, network redirections, and AIN call redirections that have taken place on the call.) When the counter exceeds the maximum number allowed (currently set at 5), the DMS SSP sends the originator to treatment FEATURE_ACTION_NACK, generates a LINE138 log, and clears the call.

When the redirection counter in the RedirectionInformation parameter exceeds 10, the DMS SSP treats the call as a non-fatal error, clears the redirection data, and completes the call.

6.6.1.1 Parameter CarrierUsage and Analyze_Route

The CalledPartyID determines the call type of a call. Parameter CarrierUsage uses the call type to select a carrier for routing. There is no impact on the existing functionality of CalledPartyID.

Parameter Carrier contains the primary carrier that can be selected for routing. The carrier in parameter Carrier need not be used when no trunk group parameters are present. The carrier selected depends on the value of parameter CarrierUsage and the call type (determined by the digits in the CalledPartyID).

Parameter CarrierUsage impacts both the AlternateCarrier and the SecondAlternateCarrier because the carrier selected depends on the value of CarrierUsage and the call type (determined by the digits in the CalledPartyID).

6.6.1.2 Terminating agent support for redirection

Terminating agent support for redirection for the Forward_Call message is same as that for the Analyze_Route message. See Section 6.6.1.4 "Terminating agent support for redirection" on page 264.

6.6.1.3 Use of redirection data in subsequent signaling

Use of redirection data for the Forward_Call message is same as that for the Analyze_Route message. See Section 6.6.1.5 "Use of redirection data in subsequent signaling" on page 265.

6.6.1.4 Terminating agent support for redirection

When a call routes and redirection has previously occurred on the call, AIN redirection data can be required by the terminating agent or service. AIN

Service Enablers supports redirection data on the following terminating agents and services:

- ISDN User Part (ISUP)
- Northern Telecom North America Primary Rate Interface (NTNA PRI)
- National ISDN Primary Rate Interface (NI PRI)
- North America PRI variants U449PRI and U459PRI
- Simplified Message Desk Interface (SMDI)

Note: Basic Rate Interface (BRI) is not supported.

6.6.1.5 Use of redirection data in subsequent signaling

AIN Service Enablers propagates redirecting data received in the RedirectionInformation and RedirectingPartyID parameters of an Analyze_Route or Forward_Call message when the call terminates to one of the agents or services listed in Section 6.6.1.4 “Terminating agent support for redirection” on page 264.

For redirected calls terminating to an ISUP trunk, the redirecting data is mapped to the Original Called Number, Redirecting Number, and Redirection Information parameters in the outgoing Initial Address Message (IAM). AIN redirecting data is used when AIN provides either or both of the first or last redirections.

For redirected calls terminating to NTNA PRI, U449PRI and U459PRI, the original redirecting party, original redirecting reason, and redirection count are mapped to a Redirecting Information Element (IE) in the outgoing SETUP message. For NTNA PRI, U449PRI and U459PRI, only original redirecting data is supported. The redirecting data is only propagated to NTNA PRI, U449PRI and U459PRI when AIN causes the first redirection on the call.

When a call that has encountered more than one redirection terminates to NI PRI, two Redirecting IEs are included in the outgoing SETUP message. The first contains the original redirecting party and reason. The second contains the last redirecting party and reason. The redirection count is not propagated over NI PRI. AIN redirecting data is used when AIN provides either or both of the first or last redirections.

For calls redirected over an SMDI link, only the original or last redirecting data is propagated. In table SLLNKDEV, option LASTFWDN is datafilled to indicate whether to send the original or last redirecting data. When LASTFWDN is set to ‘Y’, the last redirecting party and reason is sent over the SMDI link. The redirecting data is only propagated to SMDI when AIN provides the redirection corresponding to the datafill in table SLLNKDEV.

See Table 75 for a summary of the redirection data that is propagated to each supported agent or service.

Table 75 Redirection data

Agent	Original Redirecting Party	Original Redirecting Reason	Last Redirecting Party	Last Redirecting Reason	Redirection Count
ISUP	X	X	X	X	X
NTNA PRI	X	X			X
NI PRI	X	X	X	X	
SMDI	X	X	X	X	
U449PRI and U459PRI	X	X			X
Note: For SMDI, either original or last redirecting information is sent over the SMDI link depending on the value of the LASTFWDN option in the SLLNKDEV table.					

6.6.1.6 Overriding line attributes in a multi-NPA office

When the SCP returns an Analyze_Route message with a 7 digit subscriber number in response to a SDS trigger (that has a corresponding entry in table PODPATTR for a trigger group or the LARP option for a trigger item), the following tasks are performed:

- table HNPACONT is indexed by the trigger's HSTS as defined by the XLAPLAN in table PODPATTR or the LARP option
- when the NXX is duplicated in the office, the DN or route associated with the trigger's NPA is used
- trigger criteria checking for subsequent SDS triggers use the called party digits prefixed with the trigger's NPA

6.6.1.7 Extension parameter support

The special routing (SR) parameter is added as the AIN extension parameter to provide the southbound functionality required for AIN TFS based 800P support. The SR parameter is sent in AR messages from the SCP. The SCP

must also send a carrier in the AR message. If the Special Routing Parameter = 'US assigned number' and the SCP returned carrier is datafilled in table NSCCARR, the southbound call is routed over the carrier.

For SSP to know that it is a southbound call, the Analyze_route message from the SCP contains an Extension parameter with subparameter as Special Routing parameter. It also contains an Assignment Authority denoting the family of the SR parameter.

The format of the ExtensionParameter is as follows:

- AssignmentAuthority(2A864886F67D24)
- SpecialRouting(usassignednumber)

The Special Routing Parameter can contain values nilspecialroute, outofzonesubscriber, usassignednumber, transitionnumber, and maxspecialroute. For the call to be considered southbound, the value of the SR parameter should be "usassignednumber".

6.6.2 Collect_Information message

Table 76 lists the parameters that make up the Collect_Information message. Unsupported parameters are treated as when they are not received in the Collect_Information message.

Table 76 Collect_Info message parameters

Parameter	Description
AlternateBillingIndicator (O)	Functionality inherited from AIN Essentials.
AlternateDialingPlanInd (O)	
AMAAlternateBillingNumber (O)	Functionality inherited from AIN Essentials.
AMABillingFeature (O)	
AMADigitsDialedWC (up to 5) (O)	Functionality inherited from AIN Essentials.
AMALineNumber (up to 2) (O)	Functionality inherited from AIN Essentials.
AMASequenceNumber (O)	
AMAServiceProviderID	
AMAslpID (O)	Functionality inherited from AIN Essentials.
Amp1 (O)	
Amp2 (O)	

Table 76 Collect_Info message parameters (Continued)

Parameter	Description
CallingPartyID (O)	See Section 6.6.13.5 on page 299
CollectedDigits (O)	See Section 6.6.13.10 on page 304.
DPConverter (O)	See Section 6.6.13.14 on page 318
ExtensionParameter (O)	
OverflowBillingIndicator (O)	Functionality inherited from AIN Essentials.
PrimaryBillingIndicator (O)	Functionality inherited from AIN Essentials.
SecondAlternateBillingIndicator (O)	Functionality inherited from AIN Essentials.
ServiceContext (O)	
ServiceProviderID (O)	
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

The Collect_Information message returns the call to the Collect_Information PIC, that requires the switch to check the information in the CollectedDigits parameter against the dialing plan in force.

The Collect_Information message can be received in a Response package type, or in a Conversation package type when it is received with a Request_Report_BCM_Event component. It can be received in reply to the Info_Analyzed, O_Called_Party_Busy, O_No_Answer or Network_Busy messages and can be separated in time by user interactions (that is, Send_To_Resource or Resource_Clear messages)

A NEL sent with the Collect_Information message can request the O_Answer event as a notification.

A NEL sent with the Collect_Information message can request the following events as Requests:

- O_Called_Party_Busy
- O_No_Answer
- Network_Busy

The SSP processes the Collect_Information message as described in Figure 6 on page 269 to Figure 8 on page 271.

Figure 6 Collect_Information message processing

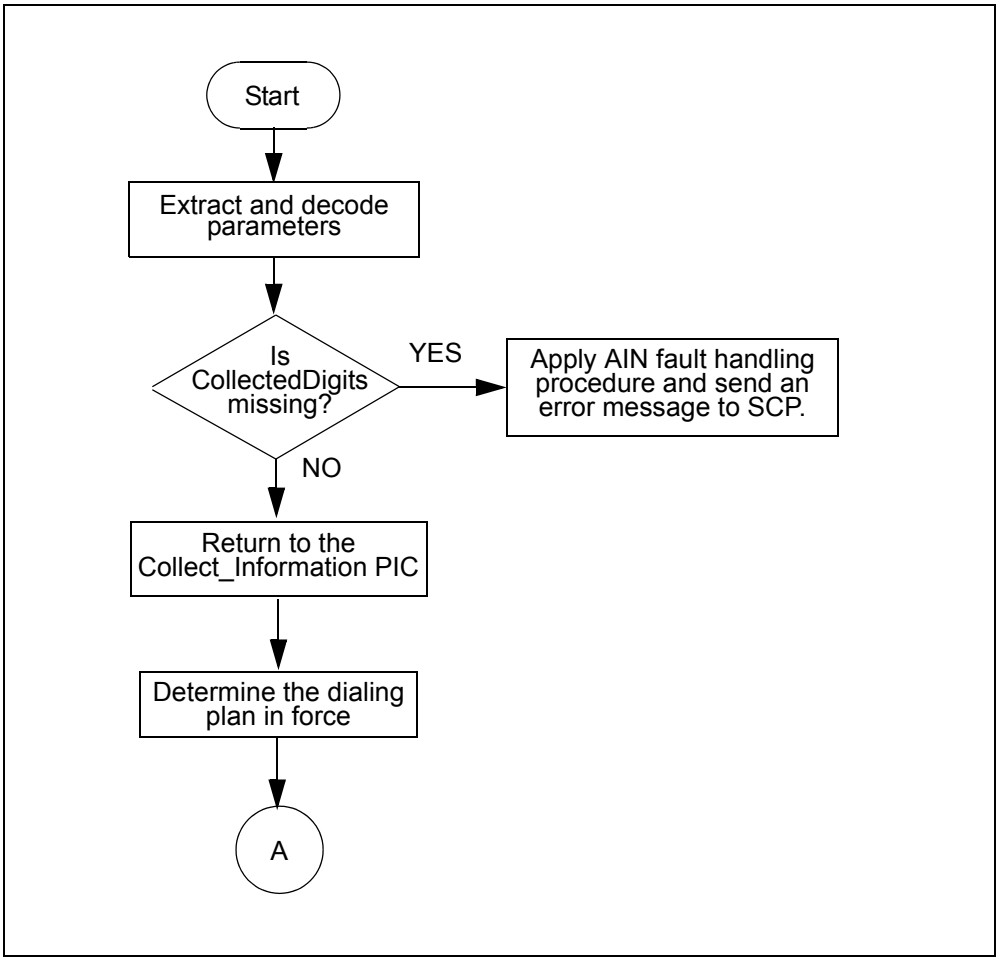


Figure 7 Collect_Information message processing (continued)

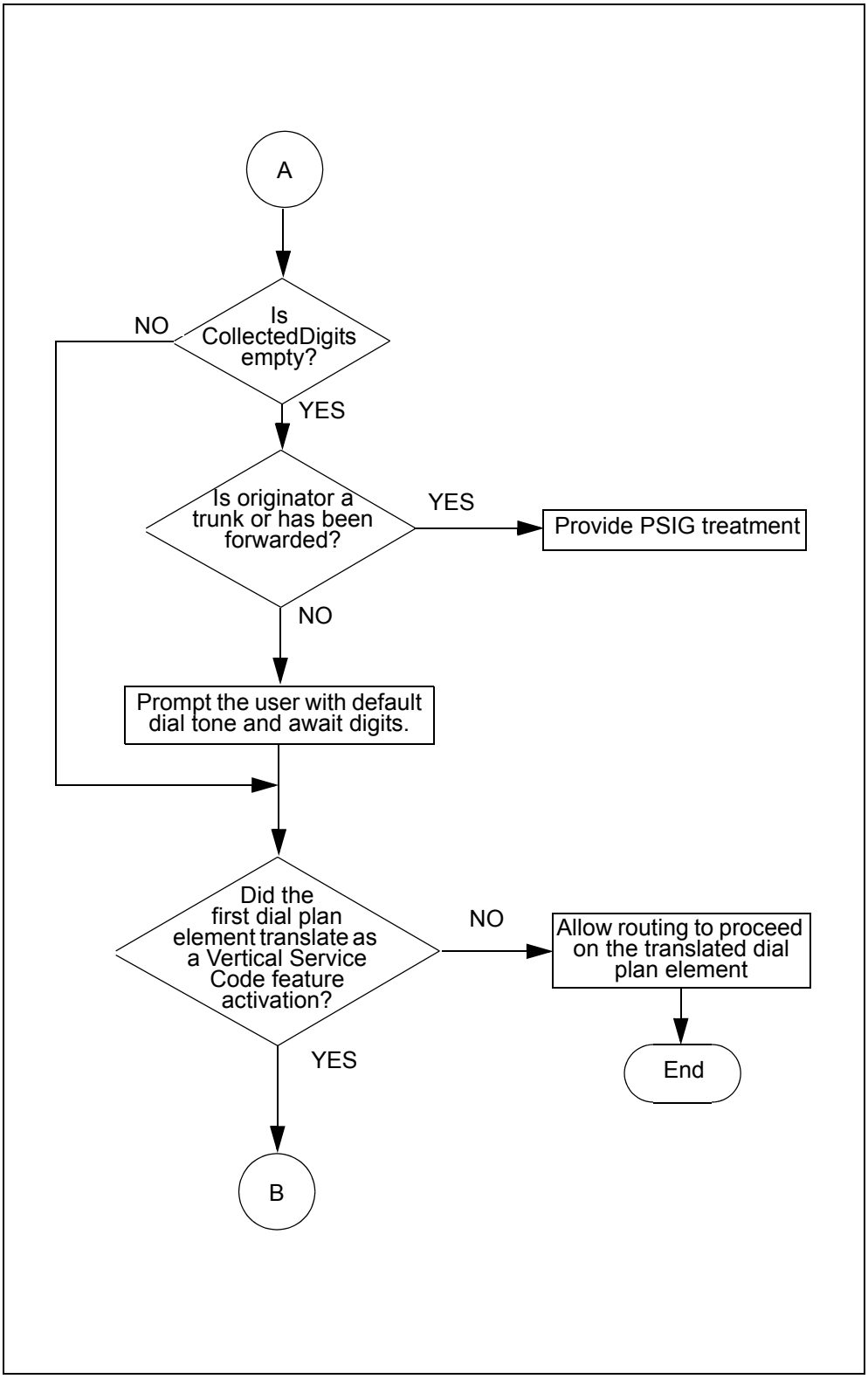
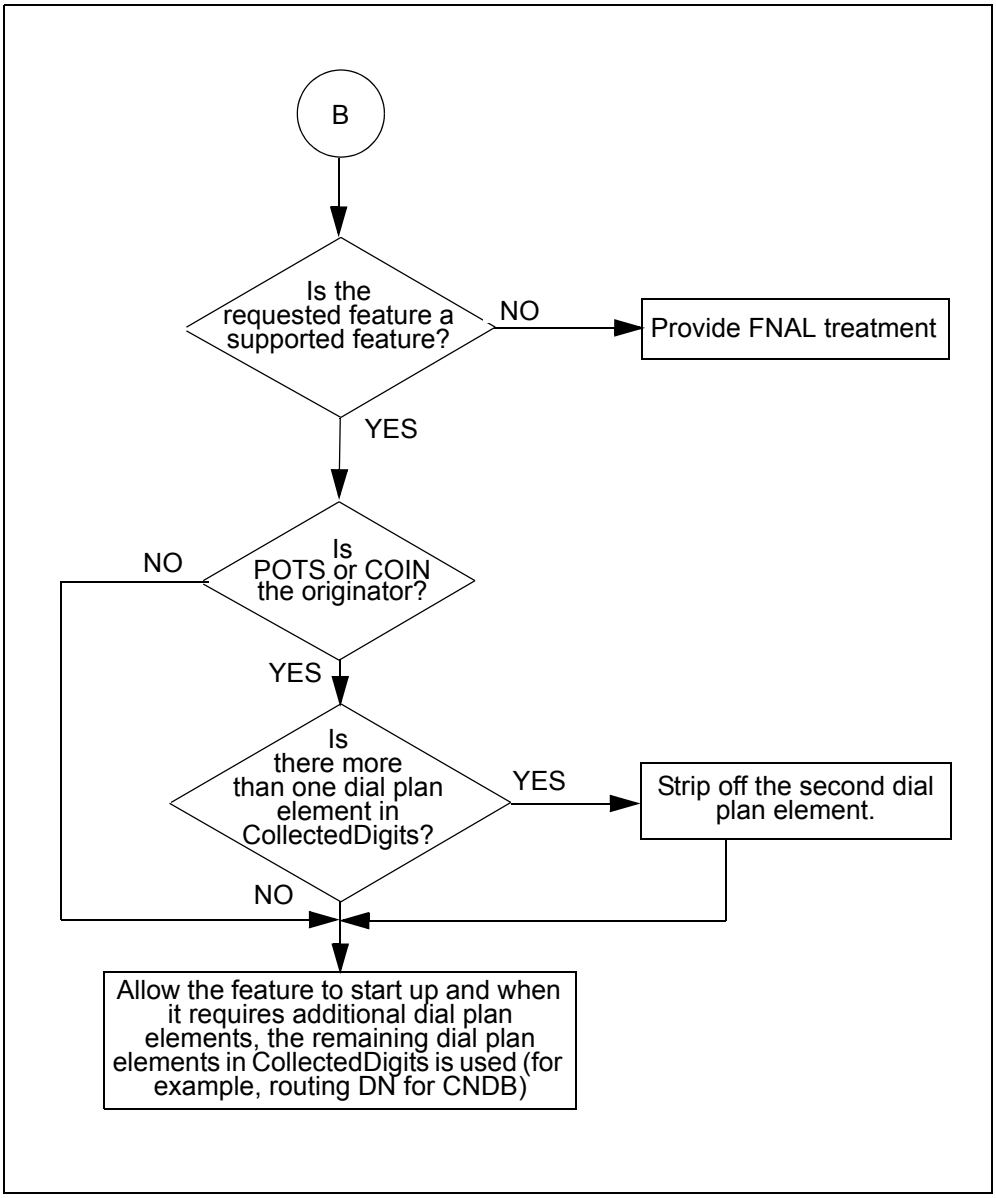


Figure 8 Collect_Information message processing (continued)



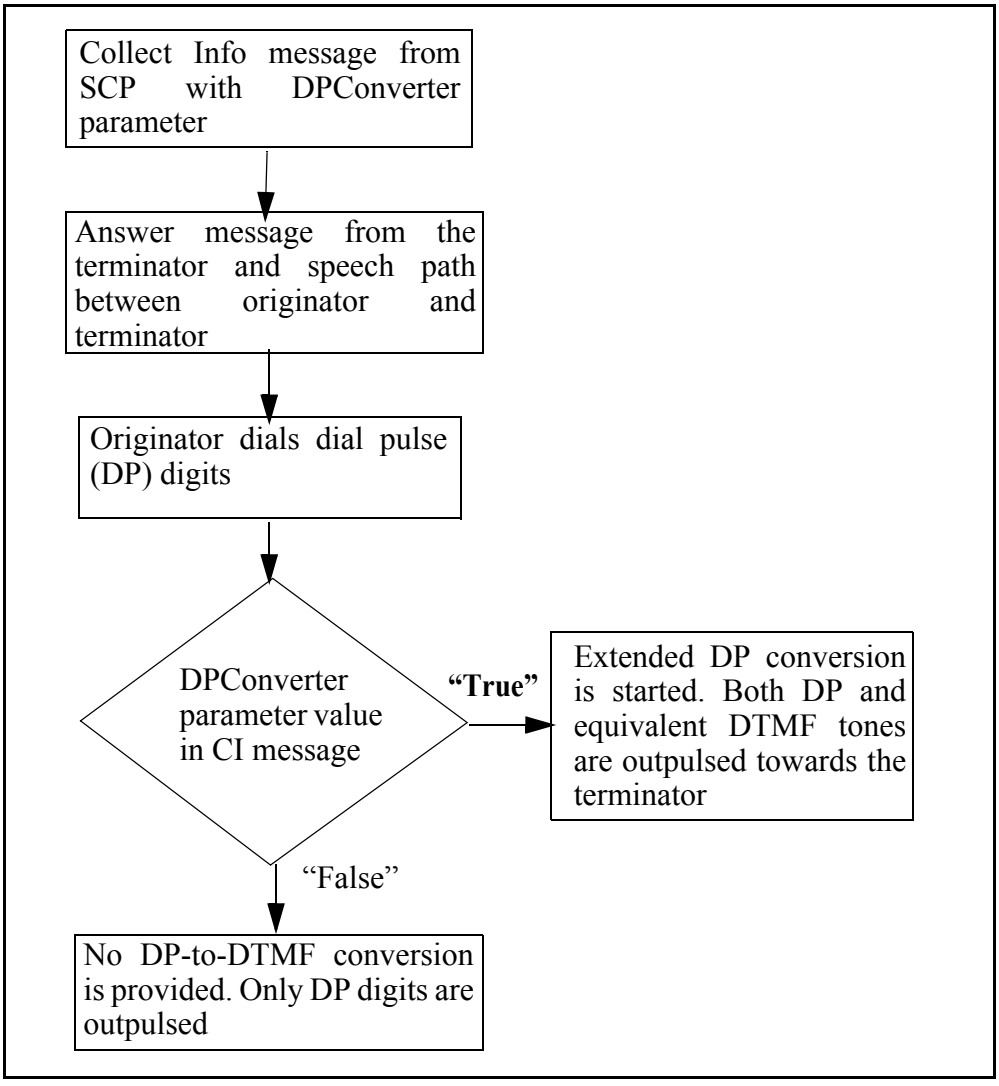
6.6.2.1 Extended DP-to-DTMF Conversion for Collect Info

When the SSP receives the DPConverter parameter in the Collect_Information message, the SSP provides the DP-to-DTMF conversion for the entire duration of the call after the speech path is established between the originator and the terminator. Please refer to Figure 9, “DP-to-DTMF Conversion for Collect Info” below.

When the Collect_Information message with DPConverter parameter set to TRUE is followed by another Collect_Information message with DPConverter parameter set to FALSE, then the DP-to-DTMF conversion is not provided

after the speech path is established between the originator and the terminator. The value of the DPConverter parameter in the last Collect_Information message in a call overrides the DPConverter parameter in any of the previous Collect_Information messages.

Figure 9 DP to DTMF Conversion for Collect Info



6.6.2.2 Determining the dial plan in effect

For the translation of the CollectedDigits, the dialling plan that is in force must be determined as it impacts the translations result. The dial plan is determined as the triggering agent's characteristics. For agents who belong to a customer group, the dial plan is the customer dial plan (as opposed to the public dial plan) and the customer group's VSC features to be activated.

When the Collect_Information message is received in response to a trigger after the call has been throttled by a virtual facility group then the dial plan characteristics associated with the VFG overrides the triggering agent's dial plan characteristics.

When the Collect_Information message is received in response to a SDS trigger with line attributes then the attributes taken from either the entry in table PODPATTR for a trigger group or the LARP option for a trigger item are ignored. The triggering agents dial plan characteristics or the VFG dial plan are used.

6.6.2.3 ISDN response translations

In translating the digits contained within the CollectedDigits parameter. The SSP uses the BearerCapability as a valid routing characteristic. No other ISDN routing characteristics, such as CDN, TNS or OSA, is used. This can affect the route taken through PXLAMAP and OFRTMAP.

6.6.2.4 Equal access routing

When the Collect_Information message is received in response to an SDS trigger with line attributes and the CollectedDigits contains a non-local number without a carrier, then the LPIC or PIC associated with the SDS trigger is used to route the call.

When a line originator encounters a trigger and the response is a Collect_Information message where the CollectedDigits contains a non-local number without a carrier, then the LPIC or PIC associated with the originating line is used to route the call.

When the CollectedDigits cause the call to be routed to a Feature Group B carrier with cut-through access, when any dial plan elements follow the dial plan element that specified routing to the carrier they are discarded since the call has been routed out of the local SSP. For example when CollectedDigits contains '950xxxx#12345678#' the local SSP upon translating the first dial plan element, '950xxxx', and routing the call to the carrier the subsequent dial plan element(s), '12345678' are discarded and the carrier could then prompt the user for digits as required.

When the CollectedDigits contain just one dial plan element with the CAC (for example, 10XXX, 101XXX, or 10XXX#) this is treated as a partial dial plan element and the call is sent to PDIL treatment.

6.6.2.5 AIN triggering after Collect_Information

Since the Collect_Information message resumes call processing at the Collect_Information PIC of the Originating Call Model, any applicable triggers after this PIC can be encountered.

When the CollectedDigits parameter contains the digits that correspond to a Specific Feature Code, Public Feature Code or CDP trigger requesting subsequent digit collection, the SSP encounters the trigger, When there is an additional dial plan element after the triggering dial plan element, then that dial plan element is used for the pre-query digit collection when required by the trigger. When the necessary subsequent dial plan element is missing, and the triggering agent is a line, the subscriber is prompted to enter the digits; When the triggering agent is a trunk, the call is sent to PDIL treatment.

When, after call processing is resumed at the Collect_Information PIC, an AIN trigger is encountered any unused dial plan elements is discarded and is not used in subsequent call processing. For example when the CollectedDigits contains `5077271234#123#' and an SDS trigger is encountered due to the `5077271234' digits, when an AIN Send_To_Resource message requesting 3 digits is received the second dial plan element `123#' is not used and the Send_To_Resource processing prompts the user for the three digits to be entered.

6.6.2.6 Query population for triggering After a Collect_Information response

For a line subscribed to the Off-Hook_Delay (OHD) trigger, the way a query is populated depends on the contents of the CollectedDigits parameter. When the triggering agent receives a Collect_Information response with CollectedDigits containing a single dial plan element consisting of digits that do not correspond to a switch based or AIN VSC, the call immediately encounters the OHD trigger. Then the CollectedDigits parameter of the Info_Collected message is populated with the contents of the CollectedDigits parameter of the Collect_Information message.

Suppose CollectedDigits contains an AIN or switched based Vertical Service Code (VSC) or CDP feature code as the first dial plan element along with some digits making up a second dial plan element. The subsequent Info_Collected message contains a VSC parameter with digits in the first dial plan element and a CollectedAddressInfo parameter with the digits contained in the second dial plan element. When the SCP returns a Collect_Information message containing CollectedDigits with only an AIN or switch based VSC, additional digits are collected from the originator prior to triggering. In addition to the VerticalServiceCode parameter, when the digits are collected using normal digit collection, then CollectedAddressInfo is included in the Info_Collected message. When it is collected using fixed or variable digit collection, then the CollectedDigits parameter of the Info_Collected message contains the second dial plan element within CollectedDigits.

6.6.2.7 Vertical service activation with Collect_Information

Two classes of vertical services are supported. The first is single dial plan services (CLASS automatic callback, CLASS automatic recall) where only one dial plan element is supplied in the CollectedDigits, namely the vertical service code. The second is multiple dial plan services (calling name or number delivery blocking) where one or more dial plan elements are supplied in the CollectedDigits, namely the vertical service code and optionally the routing number separated by a '#'.

During Collect_Information message processing, the following vertical services can be activated by the Collect_Information message, by specifying their vertical service code in the CollectedDigits parameter:

- CLASS automatic callback activation (ACB)
- CLASS automatic recall activation (AR)
- calling name delivery blocking (CNAB)
- CLASS calling number blocking (CNB)
- CLASS calling number delivery blocking (CNDB)
- CLASS calling name/number blocking (CNNB)
- speed call short activation
- speed call long activation
- network speed call activation
- variable speed call access code activation

Any other vertical services requested in the CollectedDigits result in the call being provided FNAL treatment.

These vertical services are only be permitted to activate for a triggering agent that is not a trunk and has not been previously redirected in the local SSP. The service must also be subscribed to the triggering agent prior to activation by the Collect_Information message. All three of these vertical services are permitted for RES, IBN and BRI agents. Since the ACB and AR features can not be subscribed to POTS (coin or non-coin) agents they cannot be activated the Collect_Information message on the POTS agent. Calling Name/Number Delivery Blocking are permitted for POTS agents but only the vertical service code are processed with subsequent dial plan elements (for example, routing DN) being ignored.

The following two subsections provide one example of a single dial plan feature activation one example of a multiple dial plan element feature activation to aid in the understanding of the processing.

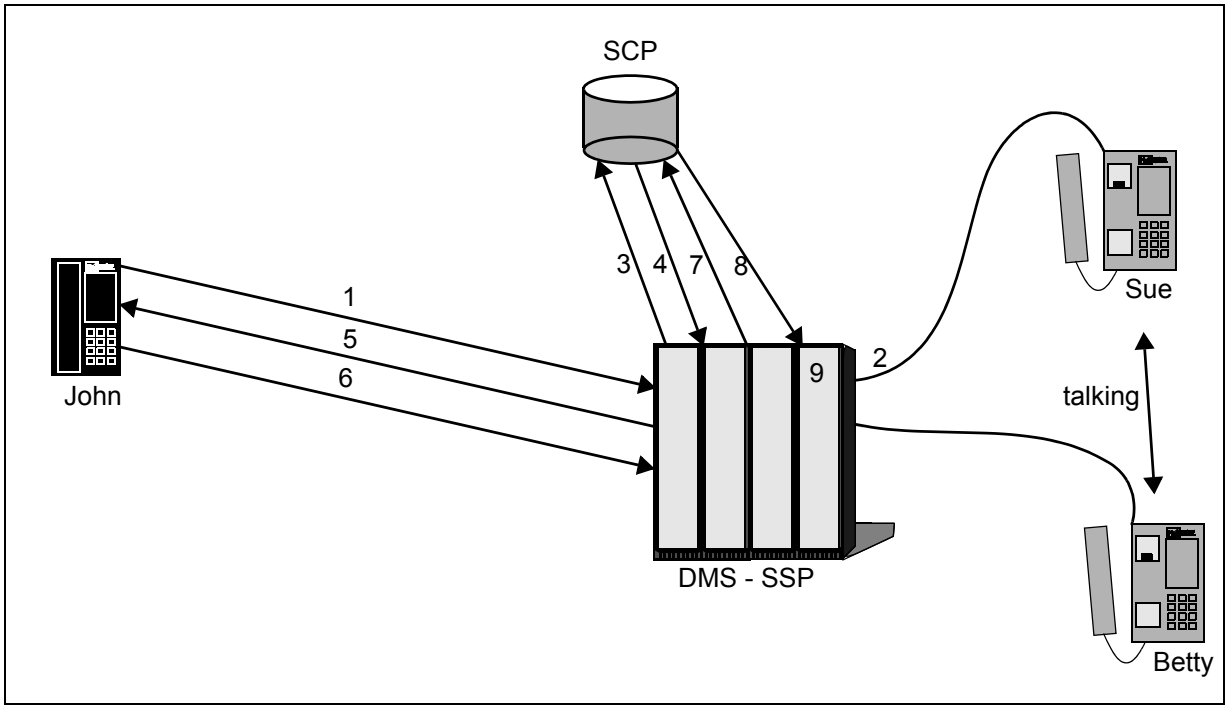
6.6.2.8 Activating automatic callback / recall with Collect_Information

The CollectedDigits parameter can contain a Vertical Service Code requesting activation of the Automatic Callback (for example, *66) or Automatic Recall (for example, *69) SSP-based features. When those features are subscribed to the agent who activates Collect_Information response processing then the feature can be requested. The Collect_Information message processing resumes processing at the beginning of the Collect_Information PIC and the CollectedDigits are translated. When the first dial plan element (for example, *66) translates to the vertical service code for activation of Automatic Callback then that feature is requested.

The following scenario and Figure 10 on page 277 show an example of how the Collect_Information message could be used to implement a service.

1. John phones Sue.
2. Sue is busy as she is currently on the phone.
3. An O_Called_Party_Busy trigger request is sent to SCP on behalf of John.
4. The SCP responds with Send_To_Resource (requesting to play announcement 123 and collect 1 digit from John)
5. SSP plays announcement to John: “The person you are calling is busy, if you would like to be called back when their phone is not in use, press ‘1’ and you will be charged 50 cents; otherwise press ‘2’.”
6. John presses ‘1’ on his phone.
7. The SSP sends a Resource_Clear message to the SCP (containing CollectedDigits = ‘1’).
8. The SCP responds with the Collect_Information message (containing CollectedDigits = ‘*66’).
9. The SSP translates the CollectedDigits and starts the Automatic Callback feature that monitors Sue’s phone line.

Figure 10 Collect_Information automatic callback scenario



6.6.2.9 Activating calling name/number delivery blocking with Collect_Information

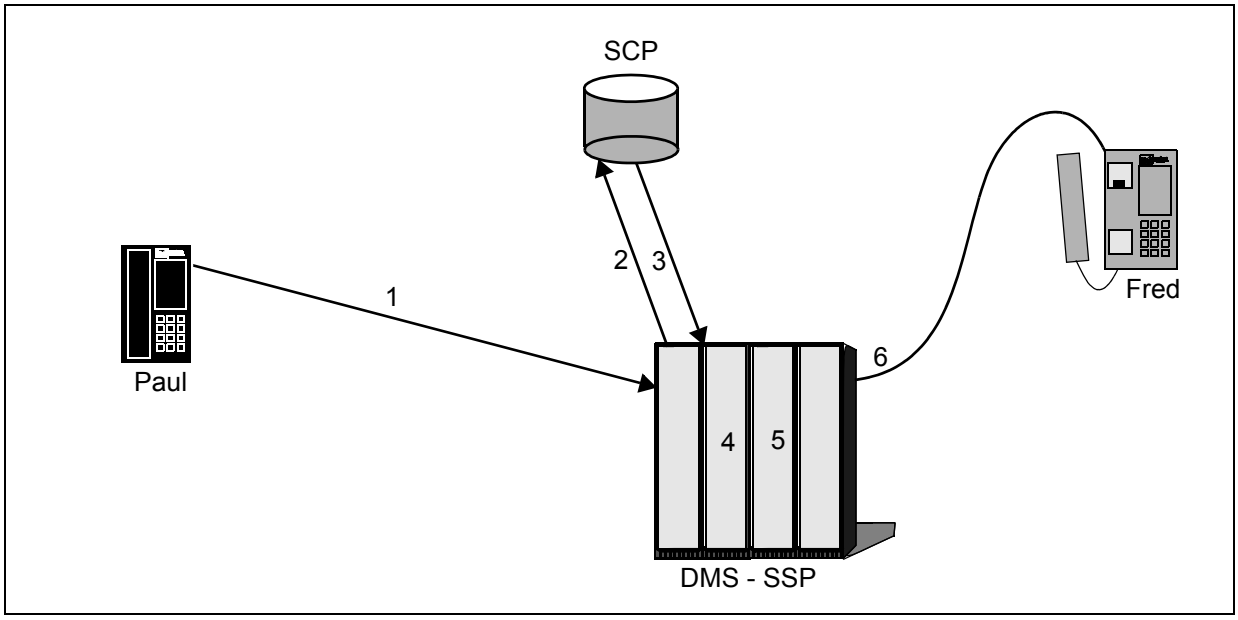
The CollectedDigits parameter can contain a Vertical Service Code requesting activation of the Calling Name/Number Delivery Blocking (for example, *67) SSP-based features. When those features are subscribed to the agent who activates Collect_Information response processing then the feature can be requested. The Collect_Information message processing resumes processing at the beginning of the Collect_Information PIC and the CollectedDigits are translated. When the first dial plan element (for example, *67) translates to the vertical service code for activation of Calling Name/Number Delivery Blocking then that feature is requested to block the caller's name and number from the terminators display. A second dial plan element can optionally be included in the CollectedDigits to specify a routing address that would be translated and the call routed to. When only the vertical service code were included in the CollectedDigits parameter then the user would be prompted (special dial tone as determined by the CNDB feature) to enter a routing address that would be translated and the call routed to.

The following scenario and Figure 11 on page 278 show an example of how the Collect_Information message could be used to implement a service.

1. Paul dials *866.
2. SDS Feature Code trigger request is sent to SCP on behalf of Paul.

3. SCP responds with the Collect_Information message (containing CollectedDigits=’*67#6213511’).
4. SSP translates the first dial plan element (*67) of the CollectedDigits and starts the Calling Name/Number Delivery Blocking feature.
5. The CNDB Feature then requests address digits.
6. The second dial plan element (6213511) that was provided in the CollectedDigits is then used as the address digits and the call is routed to Fred with the Paul’s Calling Name/Number blocked from Fred’s display.

Figure 11 Collect_Information calling name and number delivery blocking scenario



6.6.2.10 Virtual facility groups

The following Collect_Information supported CLASS features are blocked after routing through a virtual facility group (VFG) regardless of their subscription to the originator's line or customer group:

- CNDB
- CNNB
- CNAB
- CNB
- ACB
- AR

In the above cases, Feature_Not_Allowed treatment (FNAL) is applied.

Speed Call features that can be subscribed to the originator's customer group (that is, Network Speed Call) are supported by Collect_Information after routing through a VFG. Other line based Speed Call features cannot be activated after routing through a VFG and receive Partial_Dial (PDIL) treatment.

6.6.2.11 Interactions

The Collect_Information message has general interactions within AIN and with the DMS-100 switch. See Chapter 21: "AIN interactions introduction" on page 717 through Chapter 4: "Other interactions" on page 275.

6.6.2.12 Error Handling

Since all of the parameters in the Collect_Information message are optional, when there is an error in the encoding of any of the parameters it is treated as when that parameter had not been received.

When the CollectedDigits parameter, see Section 6.6.13.10 , "CollectedDigits parameter," on page 304, is not present then a fatal missing conditional parameter error is detected and AIN fault handling procedures are applied. AINF treatment is applied and an error message sent to the SCP. Note that Default_Routing procedures do not apply to this application error case.

6.6.3 Continue message and processing

The Continue response message can be received at both the Info_Collected and the Info_Analyzed TDP. It instructs the call to continue and process subsequent triggers. When no more triggers are found, the SSP attempts to route the call. When there is not enough information to perform normal routing, the call is sent to treatment.

Table 77 lists the parameters that make up the Continue message.

Table 77 Continue message parameters

Parameter	Description
AMAAlternateBillingNumber (O)	Functionality inherited from AIN Essentials.
AMABillingFeature (O)	
AMABusinessCustomerID (O)	Functionality inherited from AIN Essentials.
AMADigitsDialedWC (O)	Functionality inherited from AIN Essentials.
AMALineNumber (O)	Functionality inherited from AIN Essentials.
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

Table 77 Continue message parameters (Continued)

Parameter	Description
AMASequenceNumber (O)	
AMAServiceProviderID (O)	
AMAslpID (O)	Functionality inherited from AIN Essentials.
Amp1 (O)	
Amp2 (O)	
ExtensionParameter (O)	
PrimaryBillingIndicator (O)	Functionality inherited from AIN Essentials.
ServiceContext (O)	
ServiceProviderID (O)	
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.6.4 Authorize_Termination message

The Authorize_Termination response message, that can only be received in response to the Termination_Attempt trigger, instructs the SSP to continue processing at the Authorizing Termination point in call. Hence, normal termination occurs for the DN/call type that subscribes to this trigger.

Table 78 lists the parameters that make up the Authorize_Termination message.

Table 78 Authorize_Termination message parameters

Parameter	Description
AMAAlternateBillingNumber (O)	Functionality inherited from AIN Essentials.
AMABillingFeature (O)	
AMABusinessCustomerID (O)	Functionality inherited from AIN Essentials.
AMADigitsDialedWC (up to 5) (O)	Functionality inherited from AIN Essentials.
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

Table 78 Authorize_Termination message parameters (Continued)

Parameter	Description
AMALineNumber (up to 2) (O)	Functionality inherited from AIN Essentials.
AMASequenceNumber (O)	
AMAServiceProviderID (O)	
AMAslpID (O)	Functionality inherited from AIN Essentials.
Amp1 (O)	
Amp2 (O)	
CallingPartyID (O)	See Section 6.6.13.5 on page 299.
ControllingLegTreatment (O)	Functionality inherited from AIN Essentials.
Display Text (O)	Functionality inherited from AIN Essentials.
ExtensionParameter (O)	
GenericName (O)	See Section 6.6.13.28 on page 327.
PrimaryBillingIndicator (O)	Functionality inherited from AIN Essentials.
ServiceContext (O)	
ServiceProviderID (O)	
Tcm (O)	
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.6.5 Forward_Call message

A Forward_Call message can only be received in response to the Termination_Attempt trigger. It is similar to the Analyze_Route response in that it instructs the SSP to terminate the call on a specified address. Addresses are presented in the same format as in Analyze_Route. Using the new address information, the terminator originates a new leg in the call. Processing of the new leg begins at the Selecting Route point in call when a routing list is specified. When no routing list is specified processing begins at the Analyzing Information point in call. Processing at these points in call work similar to Analyze_Route. When triggering subsequently occurs in the Originating Call Model of this new leg, it takes place against the terminating DN (that is, the DN that the Termination_Attempt trigger was assigned to). It should be noted that most AIN TERMATT supported trunk agents do not trigger at the

Network_Busy trigger detection point on the second leg of the call. The only AIN TERMATT supported trunk agent that triggers at Network_Busy is an ISUP ATC trunk

Table 79 lists the parameters that make up the Forward_Call message.

Table 79 Forward_Call message parameters

Parameter	Description
AlternateBillingIndicator (O)	Functionality inherited from AIN Essentials.
AlternateCarrier (O)	See Section 6.6.13.6 on page 302.
AlternateTrunkGroup (O)	See Section 6.6.13.1 on page 294.
AMAAlternateBillingNumber (O)	Functionality inherited from AIN Essentials.
AMABillingFeature (O)	
AMABusinessCustomerID (O)	Functionality inherited from AIN Essentials.
AMADigitsDialedWC (up to 5) (O)	Functionality inherited from AIN Essentials.
AMALineNumber (up to 2) (O)	Functionality inherited from AIN Essentials.
AMAServiceProviderID (O)	
AMASequenceNumber (O)	
AMAslpID (O)	Functionality inherited from AIN Essentials.
Amp1 (O)	
Amp2 (O)	
CalledPartyID (O)	See Section 6.6.13.3 on page 295.
CallingPartyID (O)	See Section 6.6.13.5 on page 299.
Carrier (O)	See Section 6.6.13.6 on page 302.
CarrierUsage (O)	See Section 6.6.13.7 on page 303.
ChargeNumber (O)	See Section 6.6.13.8 on page 303.
ChargePartyStationType (O)	See Section 6.6.13.9 on page 304.
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

Table 79 Forward_Call message parameters (Continued)

Parameter	Description
ExtensionParameter (O)	
GenericAddressList (O)	See Section 6.6.13.18 on page 320.
GenericName (O)	See Section 6.6.13.28 on page 327.
OutpulseNumber (O)	See Section 6.6.13.20 on page 322.
OverflowBillingIndicator (O)	Functionality inherited from AIN Essentials.
PassiveLegTreatment (O)	Functionality inherited from AIN Essentials.
Prefix (O)	See Section 6.4.4.19.32 on page 245.
PrimaryBillingIndicator (O)	Functionality inherited from AIN Essentials.
PrimaryTrunkGroup (O)	See Section 6.4.4.19.17 on page 231.
RedirectingPartyID (O)	See Section 6.6.13.23 on page 325.
RedirectionInformation (O)	See Section 6.6.13.24 on page 325.
SecondAlternateBillingIndicator (O)	Functionality inherited from AIN Essentials.
SecondAlternateCarrier (O)	See Section 6.6.13.6 on page 302.
SecondAlternateTrunkGroup (O)	See Section 6.6.13.26 on page 326.
ServiceContext (O)	
ServiceProviderID (O)	
Tcm (O)	
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

In the Forward_Call message, the RedirectionInformation parameter is valid even when no RedirectingPartyID parameter is received. The Forward_Call message reports a missing conditional parameter application error when the Carrier parameter is not present and the CalledPartyID parameter contains zero digits and the nature of number is “no address present, operator requested”.

When the SSP receives a Forward_Call message in response to a T_Busy request message, the SSP shall do the following:

- The SSP releases any resources that is used to process the call between T_NULL and SELECT_FACILITY PICs.
- The SSP generates Structure 0220 when an AMAslpID parameter is correctly received, according to the GR-1298 requirements, section 9.
- The SSP releases the call toward the called party and processes the Foward_Call message.

6.6.5.1 Parameter CarrierUsage and Forward_Call

The CalledPartyID determines the call type of a call. Parameter CarrierUsage uses the call type to select a carrier for routing. There is no impact on the existing functionality of CalledPartyID.

The Carrier parameter contains the primary carrier that can be selected for routing. The carrier in parameter Carrier need not be used if no trunk group parameters are present. The carrier selected depends on the value of CarrierUsage and the call type (determined by the digits in the CalledPartyID).

Parameter CarrierUsage impacts both the AlternateCarrier and the SecondAlternateCarrier because the carrier selected depends on the value of CarrierUsage and the call type (determined by the digits in the CalledPartyID).

6.6.5.2 Terminating agent support for redirection

Terminating agent support for redirection for the Forward_Call message is same as that for the Analyze_Route message. See Section 6.6.1.4 “Terminating agent support for redirection” on page 264.

6.6.5.3 Use of redirection data in subsequent signaling

Use of redirection data for the Forward_Call message is same as that for the Analyze_Route message. See Section 6.6.1.5 “Use of redirection data in subsequent signaling” on page 265.

6.6.6 Offer_Call message

Table 80 lists the parameters that make up the Offer_Call message.

Table 80 Offer_Call message parameters

Parameter	Description
AMAAlternateBillingNumber (O)	Functionality inherited from AIN Essentials.
AMABillingFeature (O)	
AMABusinessCustomerID (O)	Functionality inherited from AIN Essentials.
AMADigitsDialedWC (up to 5) (O)	Functionality inherited from AIN Essentials.

Table 80 Offer_Call message parameters (Continued)

Parameter	Description
AMALineNumber (up to 2) (O)	Functionality inherited from AIN Essentials.
AMAServiceProviderID (O)	
AMASequenceNumber (O)	
AMAslpID (O)	Functionality inherited from AIN Essentials.
Amp1 (O)	
Amp2 (O)	
CallingPartyID (O)	See Section 6.6.13.5 on page 299.
ControllingLegTreatment (O)	See Section 6.6.13.11 on page 306.
DisplayText (O)	See Section 6.6.13.13 on page 306.
ExtensionParameter (O)	
GenericName (O)	See Section 6.6.13.28 on page 327.
PrimaryBillingIndicator (O)	Functionality inherited from AIN Essentials.
ServiceContext (O)	
ServiceProviderID (O)	
(M): Mandatory parameter (O): Optional parameter ***Note:*** Parameters in shaded areas are not supported in this message for this release.	

6.6.7 Disconnect message

The Disconnect response message instructs the SSP to disconnect the call. The call is given the AIN Disconnect treatment.

Table 81 lists the required parameters that make up the Disconnect message.

Table 81 Disconnect message parameters

Parameter	Description
AMAAlternateBillingNumber (O)	Functionality inherited from AIN Essentials.
AMABillingFeature (O)	
AMABusinessCustomerID (O)	Functionality inherited from AIN Essentials.

Table 81 Disconnect message parameters (Continued)

Parameter	Description
AMADigitsDialedWC (O)	Functionality inherited from AIN Essentials.
AMALineNumber (O)	Functionality inherited from AIN Essentials.
AMASequenceNumber (O)	
AMAServiceProviderID (O)	
AMAslpID (O)	Functionality inherited from AIN Essentials.
Amp1 (O)	
Amp2 (O)	
ExtensionParameter (O)	
PrimaryBillingIndicator (O)	Functionality inherited from AIN Essentials.
RTPReroutingNumber (O)	
ServiceContext (O)	
ServiceProviderID (O)	
(M): Mandatory parameter (O): Optional parameter	
Note: Parameters in shaded areas are not supported in this message for this release.	

6.6.8 CloseCause parameter

The CloseCause parameter is sent to indicate the specific reason why a Close message is sent to end a TCAP transaction between the SSP and the SCP or adjunct. The value of the parameter is dependent upon why the Close message was sent.

Table 82 CloseCause parameter

Value	Reason for Close message
CallTerminated	Call with an open transaction (resulting from NEL) has ended.
EDPsCompleted	The SSP determines that there are no more requests on the NEL or the remaining events can no longer be detected.
CalledPartyAnswered	The called party answers the call during a O_No_Answer EDP-Request.

This parameter is controlled by SOC option AIN00210.

6.6.9 Close message and processing

This section describes the implementation of the Close message and processing FS.

During call processing, either the SSP or the SCP can choose to generate and send a Close message.

6.6.9.1 Message initiated by the SSP

The SSP sends the Close message to the SCP or adjunct during an extended transaction, and continues to process the call. The Close message is required to complete open transactions created by a NEL. When a Request_Report_BCM_Event message (RRBCME) message is sent to the SSP containing only unsupported events, a Close message is sent to the SCP.

The reasons for the SSP closing a transaction are described in Table 82, on page 286.

See Table 83, on page 287 for a description of the parameters implemented in the Close message originating from the SSP.

Table 83 Close message parameters

Parameter	Description
AMP1 (O)	
AMP2 (O)	
BearerCapability (M)	See Section 6.4.4.19.4 on page 220.
CloseCause (O)	See Section 6.6.8 on page 286.
ExtensionParameter (O)	
UserID (M)	See Section 10.7 on page 324.
Note: Parameters in shaded areas are not supported in this message for this release.	

6.6.9.2 Message initiated by the SCP

The SCP can choose to close the transaction. No parameters are supported in the SCP initiated Close message. The SSP closes the open transaction and continues processing the call.

6.6.10 Send_To_Resource message and processing

The Send_To_Resource message can be received in response to any of the AIN SSP triggers. There are two flavors to this message:

- Send_To_Resource Response
- Send_To_Resource Conversation

When the SSP receives a Send_To_Resource message in response to a T_Busy message, the SSP releases the call toward the called party, and processes the Send_To_Resource message.

Send_To_Resource is described in detail in Chapter 11: "Participant interactions" on page 479.

6.6.10.1 Send_To_Resource Response

The SSP plays the designated customized or standard announcement specified in the Send_To_Resource (STR) message to the calling party. The SSP can also be instructed to pronounce digits specified in the message. Any digits the caller dials are ignored. When the SSP cannot play the announcement because the requested resource is busy or not available, reorder treatment is applied to the calling user. When the caller abandons while the announcement is being played, the SSP clears the call. When the AnswerIndicator parameter is present in the Send_To_Resource response message, AMA timing is started before playing the terminating announcement.

6.6.10.2 Send_To_Resource Conversation

The SSP plays the designated customized announcement to the calling party and, when specified in the Send_To_Resource message, collect digits. The Send_To_Resource message can also instruct the SSP to pronounce certain digits in the announcement. The announcement can be interruptible or non-interruptible. When the SSP receives all the digits, or when no digit collection is required and the announcement has finished playing, the SSP sends a message (called a Resource _Clear message) to the off-board processor. When the SSP cannot play the announcement or collect digits because the appropriate resources are not available, or when the caller abandons the call before a message is sent, the SSP sends a Resource _Clear message to the off-board processor indicating the situation. AMA timing is never started for a Send_To_Resource in a Conversation package, even when the AnswerIndicator parameter is present.

In addition to announcements, a number of tones can be requested in Send_To_Resource. To make use of these tones the following conditions must be met:

- one of the supported tone IDs must be supplied in the STR conversation or response package
- the custom announcement with ID corresponding to the tone ID must not be datafilled in table AINANNS

When there is an announcement with the requested ID datafilled in table AINANNS, it is played instead of the tone. This activity does not change functionality in cases where the ID supplied in the STR conversation package does not correspond to any of the tone IDs supported in the specified context (that is, as interruptible, uninterruptible terminating, or uninterruptible

non-terminating). In such cases, the call is still sent to the AINF treatment and a Resource _Clear message with an application error code is sent back to the SCP. Table 84 shows the tones that can be requested using this mechanism.

Table 84 Tones available to Send_To_Resource requests

Tone	STR ID	Interruptible (Note 1)	Uninterruptible non-terminating (Note 2)	Uninterruptible terminating (Note3)
Silent (Nil) Tone	5	YES	NO	YES
Special Dial Tone	6	YES	NO	YES
Confirmation Tone (Note 4)	12	NO (Note 5)	YES	YES
Reorder Tone	13	NO	NO	YES
Dial Tone	14	YES	NO	YES

Note 1: Interruptible in this table excludes interruptible with fixed digit collection - collect no digits is considered a special case.

Note 2: In conversation package.

Note 3: In response package.

Note 4: Confirmation Tone is the only example of a non continuous tone. Non continuous tones are followed by DISC treatment. Continuous tones do not time out.

Note 5: NO means that the tone is not supported in the particular context (for example, as interruptible); in this case the call is sent to RODR treatment and a Resource _Clear message is sent back to the SCP indicating Application Error.

For both flavors of the Send_To_Resource messages, the AnswerIndicator parameter is optional. When this parameter is present, it indicates that the SSP should send answer indication along the originating facility at the start of the Send_To_Resource operation, when it had not previously done so. As well, under any one of the following conditions, answer indication is sent to the originating agent (when it had not been previously sent), without regard to the presence or absence of the AnswerIndicator parameter:

- when the originating agent is a PTS trunk and a non-zero number of digits are to be collected
- when the originating agent is an ISUP trunk, the call is not end-to-end SS7, and a non-zero number of digits are to be collected

6.6.11 Cancel_Resource

The Cancel_Resource message can only be received after the SSP has received a Send_To_Resource Conversation message that requests digit collection. Cancel_Resource instructs the SSP to stop playing the announcement. The SSP then sends a message to the off-board processor indicating it has carried

out the instructions. The SSP discards any Cancel_Resource message that is received after the Resource _Clear message has been sent.

Table 85 on page 290 illustrates the relationship between the AIN SSP triggers and AIN SSP Response messages.

Table 85 AIN response – TDP relationship

TDP	Response message						
	Analyze_Route	Continue	Authorize_Termination	Forward_Call	Disconnect	Send_To_Resource	Cancel_Resource
Origination_Attempt	Res.	N/A	N/A	N/A	Res.	Res. or Conv.	N/A
Information_Collected	Res.	N/A	N/A	N/A	Res.	Res. or Conv.	N/A
Info_Analyzed	Res.	Res.	N/A	N/A	Res.	Res. or Conv.	N/A
Network_Busy	Res.	N/A	N/A	N/A	Res.	Res. or Conv.	N/A
Termination_Attempt	N/A	N/A	Res.	Res.	Res.	Res. or Conv.	N/A
Note: Res. means Response and Conv. means Conversation.							

6.6.12 Request_Report_BCM_Event message and processing

This section describes the implementation of the Request_Report_BCM_Event message and processing FS.

The SCP or adjunct can respond with a RRBCME message to the SSP to ask for subsequent events that can occur on the call. The RRBCME message contains a list of requests and notifications. This list is called a Next Event List (NEL). Based on the NEL, the SSP arms the associated EDPs for subsequent monitoring.

The SCP can send the RRBCME message in response to either a trigger request message or an event request message. During call processing, the first RRBCME message is always sent in response to a trigger request message.

6.6.12.1 RRBCME message in response to a trigger request

The list of valid requests and notifications that the SCP can ask depends on the SCP call-related message received with the RRBCME message in the conversation package as shown in Table 86.

Table 86 Valid RRBCME and message pairings

SCP call-related message	Valid requests and notifications								
	O_Disconnect (R)	O_Disconnect_Called (R)	Timeout (R)	O_Called_Party_Busy (R)	O_No_Answer (R)	O_Answer (N)	Network_Busy (R)	T_Busy (R)	T_No_Answer (R)
Analyze_Route	X	X	X	X	X	X	X		
Forward_Call		X	X	X	X	X	X		
Continue	X	X	X	X	X	X	X		X
Authorize_Termination			X					X	X
Collect_Information	X	X	X	X	X	X	X		
Offer_Call			X						
Connect_to_Resource	X	X							

Note 1: X denotes valid combinations of messages.

Note 2: The shaded areas are not currently supported.

Note 3: Arming T_no_Answer from a RRBCME component that is received with a Continue message, is only possible when the Continue message is sent in response to a T_Busy EDP-R message. When the Continue is not in response to a T_Busy EDP-R message, then the request is ignored and a Close message with no parameters is sent to the SCP.

The RRBCME message can also be received in conjunction with the Send_Notification and the ACG non call-related message.

When a Disconnect message is received in conversation package in conjunction with a NEL, a fatal unexpected message error is reported. This error is fatal to both the Disconnect component and the RRBCME component; that is, the Disconnect message is not processed.

6.6.12.2 RRBCME message in response to an event request

When the SSP detects that the criteria of an armed event are matched, it sends an event request message to the SCP to ask for further instructions. The SCP can respond with another RRBCME message.

As new EDPs are supported, the responses are enhanced to direct the call to the appropriate point in call (PIC) from the new EDPs. As in responses to trigger requests, the list of valid requests that the SCP can ask depends on the SCP call-related message received with the RRBCME message in the conversation packages. See Table 87.

Table 87 Valid messages in response to an EDP-R

Valid requests	SCP call-related message								
	Analyze_Route	Connect_To_Resource	Continue	Authorize_Termination	Forward_Call	Offer_Call	Disconnect	Send_To_Resource	Collect_Information
O_Called_Party_Busy (R)	X		X					X	X
O_No_Answer (R)	X		X					X	X
Network_Busy (R)	X						X	X	X
O_Suspend (R)								X	X
O_Disconnect (R)		X					X		
O_Disconnect_Called (R)	X	X					X	X	X
Origination_Attempt (R)	X		X				X	X	
T_Busy (R)			X		X	X		X	
T_No_Answer (R)			X		X			X	
Timeout (R)	X	X	X		X		X	X	

Note 1: Denotes valid combinations of messages.

Note 2: The shaded areas are not currently supported.

When Timeout EDP-R is sent and an invalid response is returned from SCP, SSP will send an Application_Error message containing an ErrorCause parameter with a value of “Unexpected Message.”

The SCP response message Offer_Call is unsupported on the DMS-100 switch.

6.6.12.3 RRBCME parameters

The RRBCME message contains the parameters shown in Table 88.

Table 88 RRBCME message parameters

Parameter	Description
EDPNotification (O)	See Section 6.6.13.15 on page 318.
EDPRequest (O)	See Section 6.6.13.16 on page 319.
ExtensionParameter (O)	
ONoAnswerTimer (O)	See Section 10.4 on page 323.
TimeoutTimer (O)	See Section 8.12 on page 449.
TNoAnswerTimer (O)	See Section 10.5 on page 323.
Note: Parameters in shaded areas are not supported in this message for this release.	

6.6.12.4 RRBCME error handling

The RRBCME is analyzed when it is received. An erroneous data value error is indicated when any of the following occurs:

- the RRBCME fails to arm at least one EDP
- a request or notification is received in a NEL that does not correspond to a valid SCP call-related message as specified in Table 86 on page 291.
- the timer value is not between 1 to 120 seconds inclusive
- the timers are supplied but not the corresponding event request. That is, the ONoAnswerTimer parameter can only be supplied when the O_No_Answer request is indicated in the contents of the EDPRequest parameter.

The non-fatal error in the RRBCME component is reported to the SCP by sending an application error message in a Response package. The call-related component (for example, Analyze_Route) is processed as though it had been received without the presence of the RRBCME component.

When the RRBCME message is received in a response package instead of a conversation package, then a fatal application error due to an unexpected message is detected and reported in unidirectional package.

When the RRBCME message is received in conjunction with a fatal SCP call-related message, the cause of the fatal SCP call-related message is reported to the SCP in a Response package.

6.6.13 Response message parameters

With the exception of parameter CollectDigits, all AIN Service Enablers message parameters are the same as the equivalent AIN Essentials message parameters.

See Section 20.3 “Messaging and parameter limitations” on page 671 for limitations associated with parameters.

6.6.13.1 AlternateTrunkGroup parameter

The AlternateTrunkGroup parameter is one of three trunk group parameters used to specify a SSP route list to attempt to terminate the call on. The other two parameters are the PrimaryTrunkGroup parameter and the SecondAlternateTrunkGroup parameter.

The trunk group parameters contain the following fields:

- Number To Outpulse—The Number To Outpulse field directs the call to outpulse the information in either the Outpulse parameter or the CalledPartyID parameter. The CalledPartyId parameter is used when the Number To Outpulse field contains a value of “normal routing number”. Otherwise, the Outpulse parameter is used.
- When the Number To Outpulse field says to outpulse information from a parameter that has not been received, the SSP discards the trunk group parameter. All subsequent address parameters are also discarded.
- WATS Indicator—The WATS Indicator field identifies when the call is to route over WATS facilities. The SSP does not perform any WATS screening when this indicator is set to “WATS”. It assumes that the SCP or adjunct has done all the screening.
- When the originator is a POTS agent, and the WATS indicator is used for routing a call during processing an Analyze_Route message, the call is blocked from terminating and is sent to AINF treatment. Likewise, when the AINDN is a POTS agent and the WATS indicator is used for routing on Forward_Call message, the call is sent to AINF treatment.
- Call Treatment Indicator—The Call Treatment Indicator field directs the call when the route list is busy. The DMS SSP only supports the following value: “Overflow”.
- This Call Treatment Indicator value directs the call to attempt to terminate on the next address.

- All other Call Treatment Indicator values are not supported. When an unacceptable Call Treatment Indicator value is present, then the SSP treats the call as when the Call Treatment Indicator value was “Overflow”.
- Route Index—The Route Index field contains 8 digits, encoded in BCD. On the DMS SSP, the digits are used to identify the routing table and the routing index. The SSP verifies that the contents within the digit field is a value from “0” to “9” inclusive. Then, it converts the digits into an integer, by concatenating the digits. For example, when the contents of the 1st digit field is “0” and the 2nd digit field is “2” (all other digits fields are “0”), then the integer value derived is 20. The integer value is then used to derive the DMS routing table and index. Table 411 on page 964 explains the mapping algorithm used.
- Once the routing table and index is derived, the routing table is referenced at the specified index. The DMS SSP then verifies that the routing selectors are allowed for the AIN call. Table 412 on page 964 and Table 413 on page 965 specify the routing selectors supported.
- While converting the digits, and verifying the routing selectors, the DMS SSP can determine that the routing index specified by the SCP or adjunct is unacceptable. A route list is unacceptable when it contains any selectors that are not supported or the route list is not datafilled on the switch. When the DMS SSP receives a routing index that is unacceptable, then the DMS SSP discards the trunk group parameter. All subsequent address parameters in the message are also discarded.

6.6.13.2 AnswerIndicator parameter

Sending Answer Supervision to the calling party is not supported in BCS36. The current implementation results in the following answer-supervision:

- When performing a Send_To_Resource operation on a PTS trunk, Off_Hook is never propagated, even when the AnswerIndicator parameter is present.
- When performing a Send_To_Resource operation on a PRI trunk, CONNECT is always propagated, even when the AnswerIndicator parameter is absent.
- When performing a Send_To_Resource operation on an ISUP trunk, ANM is never propagated, even when the AnswerIndicator parameter is present.

6.6.13.3 CalledPartyID parameter

The CalledPartyID parameter contains the directory number associated with the called party.

The maximum number of digits for international calls is 15. The minimum number of digits for international 01+ calls is 1. The value of the Nature of Number field for 950-XXXX calls is “950+ Call”. The value of “National” for

the Nature of Number field remains valid for 950+XXXX calls to allow a smooth transition from the "National" value to the "950+ Call" value.

The CalledPartyID is used in two ways. When termination could not achieved using the Primary, Alternate, or SecondAlternate trunk groups, or with the Primary, Alternate, or SecondAlternate carriers, then the call is sent to treatment, but the DMS SSP does not notify the SCP of the error. When neither a trunk group nor a non local carrier is present in the Response message, then the call is retranslated with the directory number in the CalledPartyID parameter.

When the call can route using information in one of Primary, Alternate, or SecondAlternate trunk group parameters and that trunk group parameter specifies "normal routing number", then the CalledPartyID parameter is used for outpulsing.

The behavior of the CalledPartyID parameter varies according to the following types of trunks:

- Q764 ISUP trunks — The CalledPartyID parameter is propagated to the ISUP Called Party Address (CDPA) parameter. A direct mapping is used.
- Q931 PRI trunks — The propagation rules for the CalledPartyID parameter are the same as those for the OutpulseNumber parameter. See Section 6.6.13.20 "OutpulseNumber parameter" on page 322
- PTS trunks — The Called digits outpulsed over the trunk are the contents of the CalledPartyID parameter.

When the CalledPartyID parameter contains 0 digits and the nature of number field is set to "no address present, operator requested," the SSP looks at the Carrier parameter and use the Carrier ID to route the call to the LEC operator or the operator associated with the Carrier ID. When no carrier is returned in the response, the DMS SSP treats this condition as a missing conditional parameter application error.

This parameter is controlled by SOC option AIN0002.

6.6.13.4 CallingPartyBGID parameter

The CallingPartyBGID parameter an Analyze_Route message conveys business group information to an ISUP message. This enables business group information received from the SCP in to be used in signaling and features on the call.

The CallingPartyBGID returned by the SCP is outpulsed in the outgoing SS7 Initial Address Message (IAM), but is not used in retranslation based on other components of the Analyze_Route message. In addition, the CallingPartyBGID returned by the SCP does not affect feature activation or

restriction on intraswitch calls. The result is that features and restrictions in the next switch use the new CallingPartyBGID information returned by the SCP. Multi-Business Group features and restrictions operate normally in that switch.

In the case of serial triggering, any CallingPartyBGID already returned by the SCP is sent in the next SCP query.

The format for the CallingPartyBGID is illustrated in Table 89 "CallingPartyBGID parameter format". Comments on the individual subfields follow.

Table 89 CallingPartyBGID parameter format

H	G	F	E	D	C	B	A
Spare	AttSt	BGID tp	LPII	Party Selector			
Business group ID (3 octets)							
Subgroup ID (2 octets)							
Line privileges (1 octet)							

The four-bit party selector subfield indicates the number that the business group information applies to. See Table 90 for possible values and definitions.

Table 90 Party selector subfield values

Value	Definition
0001	Calling party number
0100	Redirecting number
0110 to 1111	Spare

When a CallingPartyBGID party selector of Redirecting Number is returned by the SCP, the CallingPartyBGID parameter is not outpulsed in the IAM.

The Line Privileges Information Indicator (LPII) subfield is a one-bit field that indicates whether restrictions are fixed or customer-defined. For queries, GR-1299 specifies that LPII is always set to "Fixed Line Privileges." This means that the Line Privileges field is also always set to "00000000" since it provides no information unless customer-defined line privileges are used.

The Business Group Identifier (BGID) tp subfield is a one bit-field that indicates the service associated with the business group identifier. See Table 91.

Table 91 BGID subfield values

Value	Definition
0	BG Identifier
1	Interworking with Private Networks (IWPN)

In the DMS SSP, the BGID tp subfield is always set to "BG Identifier." When "Interworking with Private Networks" is returned by the SCP, it is outpulsed in the IAM message since it is not an Erroneous Data Value, but it is not used within the DMS SSP pending clarification of Bellcore requirements.

The Attendant Status (AttSt) subfield is a one-bit field that indicates whether the party identified by the Party Selector is an attendant console. See Table 92.

Table 92 AttSt subfield values

Value	Definition
0	No indication
1	Attendant line

The Business Group ID subfield is a three-octet field that indicates the business group that the party identified by the Party Selector belongs to. Business Group IDs are uniquely assigned to customers across all networks where the business group customer subscribes to business group services. See Table 93.

Table 93 Business Group ID subfield values

Value	Definition
0000..0010 to 1111..1111	Assigned business codes

The Sub-group ID subfield is a two-octet field defined by customers to indicate the subgroup membership of the party within the customer's organization.

The DMS SSP only supports 'No Indication' as a valid Sub-group ID value. When a different value is sent by the SCP, it is outpulsed in the IAM message since it is not an Erroneous Data Value, but it is not used within the DMS SSP.

The Line Privileges subfield is defined by the operating company to indicate the line privileges of the party identified by the Party Selector. When the LPII subfield is set to “Fixed Line Privileges”, the Line Privileges subfield is divided into two further subfields to represent the terminating (bits ABCD) and originating (bits EFGH) restrictions. The Line Privileges parameter is always set to “00000000” for queries as specified in GR-1299. See Table 94 and Table 95.

Table 94 Line privileges subfield originating restrictions (bits EFGH)

Value	Definition
0000	Unrestricted
0101 to 1111	Spare

Table 95 Line privileges subfield terminating restrictions (bits ABCD)

Value	Definition
0000	Unrestricted
0101 to 1111	Spare

When the SCP returns values that have been reserved in GR-1299 but are not yet implemented by AIN Service Enablers, those values are treated as Erroneous Data Value application errors and are discarded.

This parameter is controlled by SOC option AIN00220.

6.6.13.5 CallingPartyID parameter

When parameter CallingPartyID is included, it is used by all supported features that subsequently act on this information for the call, including AIN.

Parameter CallingPartyID is used for trunk signaling for the following types of trunks:

- Q764 ISUP trunks—The CallingPartyID parameter is propagated to the ISUP Calling Party Address (CGPA) parameter. A direct mapping is used.
- Q931 PRI trunks—The CallingPartyID parameter is propagated to the Calling Party Number Information Element in the Q.931 SETUP message being sent over the PRI trunking facility. No Calling Party Subaddress Information Element is included in the Q.931 SETUP message when the

CallingPartyID parameter is propagated. Table 96 shows the format of the CallingPartyID parameter.

Table 96 Format of CallingPartyID parameter

H	G	F	E	D	C	B	A
Odd/ Even	Nature of Number						
Spare	Numbering Plan			Pres Restriction		Scrn Restriction	
2nd Digit				1st Digit			
* * *				* * *			
Nth Digit				N-1st Digit			

- Table 97 shows the format of the Calling Party information element.

Table 97 Format of Calling Party Number information element

H	G	F	E	D	C	B	A
0	1	1	0	1	1	0	0
Length of Information element (octets)							
0/1 Ext.	Type of Number			Number Plan ID			
1 Ext.	Pres Restriction		0 Spare	Reserved		Scrn Restriction	
Spare	Digits (IA5 Characters)						

- Table 98 through Table 100 on page 301 illustrate the mapping of the CallingPartyID parameter to the calling party number information element.

Table 98 Parameter to information element mapping

CallingPartyID parameter	Calling Party Number information element	Mapping
Nature of Number	Type of Number	Generated by DMS SSP
Numbering Plan	Numbering Plan ID	Generated by DMS SSP
Pres Restriction	Pres Restriction	Direct Mapping
Scrn Restriction	Scrn Restriction	Direct Mapping
Address Digits	Digits	Direct Mapping

Table 99 Numbering plan to numbering plan ID mapping

Numbering plan	Numbering plan ID
ISDN Numbering Plan 0001	ISDN Numbering Plan (Rec. E164) 001
Private 0101	Private 101
Otherwise	Unknown 000

Table 100 Nature of number to Type of number mapping

Nature of Number	Type of Number
Non-Unique International Number 1110100	International Number 001
Unique International Number 0000100	
Non-Unique National Number 1110011	National Number 010
Unique National Number 0000011	

Table 100 Nature of number to Type of number mapping (Continued)

Nature of Number	Type of Number
Non-Unique Subscriber Number 1110001	Local Number 100
Unique subscriber Number 0000001	
Otherwise	Unknown 000

- PTS trunks—The CallingPartyID parameter is not propagated over PTS trunks. Only the ChargeNumber is spilled.

6.6.13.6 Carrier, AlternateCarrier and SecondAlternateCarrier parameters

The Carrier, AlternateCarrier and SecondAlternateCarrier parameters contain the carrier selection information and the carrier identification to that a call is routed. These parameters are only valid in equal access end offices.

The Carrier parameters are optionally found in the following SCP-to-SSP messages:

- Analyze_Route—When routing could not complete successfully using the Primary, Alternate or SecondAlternate trunk group information, then the information supplied in the Primary, Alternate and SecondAlternate Carrier parameters are each tried in turn. The carrier information is used to re-translate (along with the CalledPartyID). When the SSP translates to a valid route, then that route is used.
- Forward_Call—The carrier parameters are used as in the Analyze_Route response except that the carrier information applies to the called party information.
- Send_To_Resource—The SCP can specify a set of carriers to connect the originator to the IP.

The logic driving of these parameters varies according to the following types of trunks:

- Q764 ISP trunks—The carrier parameters are propagated to the ISUP Carrier Selection parameter when the call gets a response of Analyze_Route and the route is a result of one of the three carriers provided by the Analyze_Route response.
- Q931 PRI trunks—The carrier parameters do not get propagated over PRI trunk facilities.
- PTS trunks—The carrier parameters do not get propagated over these trunking facilities.

6.6.13.7 Parameter CarrierUsage

The following values are supported for parameter CarrierUsage:

- 0 or AlwaysOverride
- 1 or InterlataOverride
- 2 or OverridePICsOfNOCsSent

AlwaysOverride: When the value of parameter CarrierUsage is AlwaysOverride, existing functionality is maintained. When the SCP sends a carrier in the message and no CarrierUsage parameter, the carrier is treated the same way as when AlwaysOverride is received in parameter CarrierUsage.

InterlataOverride When the value of parameter CarrierUsage is InterlataOverride, the carrier that gets sent by the SCP is used only when the call type (determined from parameter CalledPartyID) is interlata. When the call type is not interlata, the SSP selects a carrier.

OverridePICsOfNOCsSent When the value of parameter CarrierUsage is OverridePICsOfNOCsSent, the carrier selected for routing is based on the value of the NatureOfCarrier (NOC) received in parameter CarrierID.

6.6.13.8 ChargeNumber parameter

The ChargeNumber parameter contains the Automatic Number Identification (ANI) used for subsequent signalling. The ChargeNumber parameter does not affect billing on the SSP. This parameter must be accompanied by the ChargePartyStationType parameter; otherwise, the ChargeNumber is discarded.

The contents of the ChargeNumber is sent as follows:

- **MF trunks that support ANI**

  The digits received in the ChargeNumber are sent as MF ANI digits over the trunking facility.

- **ISUP trunks**

  The contents of the ChargeNumber is used to populate the ISDNUP charge number. The ISDNUP charge number is always populated, when the ChargeNumber parameter is received, regardless of whether the call is interLATA; thus, the connecting SSP must be able to discard the ChargeNumber parameter, when it is not required.

- **PRI trunks**

  The ChargeNumber is not propagated.

When the call terminates to a line, a simulated facility group (that is, virtual groups), or a trunk not mentioned above, then the ChargeNumber parameter is discarded.

See Section 6.4.4.19.15 “ChargePartyStationType parameter” on page 230.

6.6.13.9 ChargePartyStationType parameter

The ChargePartyStationType indicates the calling station type. This parameter contains the originating line information (OLI) of the originating party. The ChargePartyStationType uses it own format that consists of two BCD digits. The values that are supported are documented in TA-NWT-001285, *AIN 0.1 Switch Service Control Point Application Protocol Interface Generic Requirements*, Issue 1, January 1992.

The ChargePartyStationType parameter is optionally sent in the following SCP-to-SSP messages: Analyze_Route, Authorize_Termination, and Forward_Call.

When the parameter is included, then the ChargePartyStationType parameter is used as the ANI II digits for MF and the OLI parameter for ISUP trunks.

The ChargePartyStation Type parameter is only propagated over the supported trunking facilities when it is accompanied with the ChargeNumber parameter.

The following section detail how the ChargePartyStationType parameter is used for various facility types:

- Q764 ISUP trunks—The ChargePartyStationType parameter is propagated to the ISUP Originating Line Information only when the ChargeNumber parameter is also provided. The OLI parameter is included in the outgoing Initial Address Message (IAM) regardless of:
  - — whether the call is Equal Access, and
  - — any SSP based datafill (for example, table OCCINFO)

  The OLI parameter is directly mapped from the ChargePartyStationType parameter.
- Q931 PRI trunks—The ChargePartyStationType parameter does not get propagated over PRI Trunk facilities.
- PTS trunks—The ChargePartyStationType parameter is only outpulsed over the following trunk group types:
  - — CAMA Trunks that support ANI II digits
  - — TSPS/TOPS Trunks that support ANI II digits
  - — ATC OP Service Trunks that support ANI II digits
  - — InterToll Trunks during Equal Access Call scenarios.

6.6.13.10 CollectedDigits parameter

Parameter CollectedDigits indicates the dial plan elements to be used when processing resumes at the Collect_Information PIC.

The maximum number of digits is 32, that could consist of more than one dial plan element. The minimum number of digits is 0 in that the line originator would be prompted for digits. When there are 0 digits specified but the originator is a trunk or has previously been forwarded then DMS SSP provides Negative Acknowledgment (NACK) treatment.

The valid digits for CollectedDigits are ‘0-9', ‘*' and ‘#'. When the CollectedDigits contains a ‘#' it is treated as a delimiter between dial plan elements provided it is not the last digit in the string; otherwise it is treated as the end of dialing. When CollectedDigits contains a ‘#' in the first position, then CollectedDigits is treated as an octothorpe translation. When the CollectedDigits contains a ‘*' it is treated as the prefix to a vertical service code.

A dialing plan element is a pattern of dialed digits that, by itself, could be dialed by the user and result in either activation of a feature, translation/routing of a call or the SSP providing a prompt for additional digits to the user. Following are examples of valid dialing plan elements:

- NXX-XXXX/NPA-NXX-XXXX
- 1+(NPA/500/700/800/888/8xx/900)-NXX-XXXX
- 0-
- 0+(category 1)
- 011+international number
- 00-
- 10XXX/101XXXX)/0ZZXXX/1NNXXX + (category 1~5)
- extension number 1~7 digits
- prefix/access code (for example, ‘9’ for outside line) (for line origination only, and user inputs rest of digits)

  Caution: this dial plan element is not supported on the DMS-100.
- prefix/access code + (category 1~7)
- vertical service code (for example, *X, *XX, ..., *XXXXXXX)
- vertical service code, # prefix (for example, #X, #XX, ..., #XXXXXXX)

It is recommended that dial plan elements are separated by the octothorpe (#) digit as this aids the SSP in resolving ambiguity in dial plan elements. For example the SSP can be set up to have ambiguous vertical service codes such as *86 and *862. When there are multiple dial plan elements and they are not separated by an octothorpe then the ambiguity cannot be resolved. For example *862581234 could be interpreted as *862 and address digits of 581234, where the SCP application intended it to be interpreted as *86 and

address digits of 258-1234. When the SCP application includes the octothorpe as the delimiter (for example, *86#2581234), then these issues are resolved.

When parameter CollectedDigits contains just one dial plan element with the CAC (for example, 10XXX, 101XXX or 10XXX#), this is treated as a partial dial plan element and the call is sent to PDIL treatment.

When parameter CollectedDigits is not present in the Collect_Information message, the DMS-100 SSP treats this condition as missing conditional parameter application error.

6.6.13.11 ControllingLegTreatment parameter

This parameter specifies the designated distinctive alerting pattern to be applied to the called party. When the called party is not served by the SSP, the parameter is ignored.

When the call is subsequently forwarded, this parameter is ignored.

6.6.13.12 DisconnectFlag parameter

This parameter indicates whether a call should be disconnected after a Send_To_Resource operation. When this parameter is included, the SSP disconnects the call after a Send_To_Resource operation.

When this parameter is received in a Conversation TCAP Package Type or when a Response package with a Send_To_Resource operation is received without this parameter, the SSP treats this message as containing a fatal erroneous data value error and provide final treatment.

6.6.13.13 DisplayText parameter

Parameter DisplayText can be received in either of the following response messages:

- an Authorize_Termination response message that is received at the Termination_Attempt trigger detection point (TDP)
- an Offer_Call response message that is received at T_Busy event detection point (EDP) or trigger detection point TDP

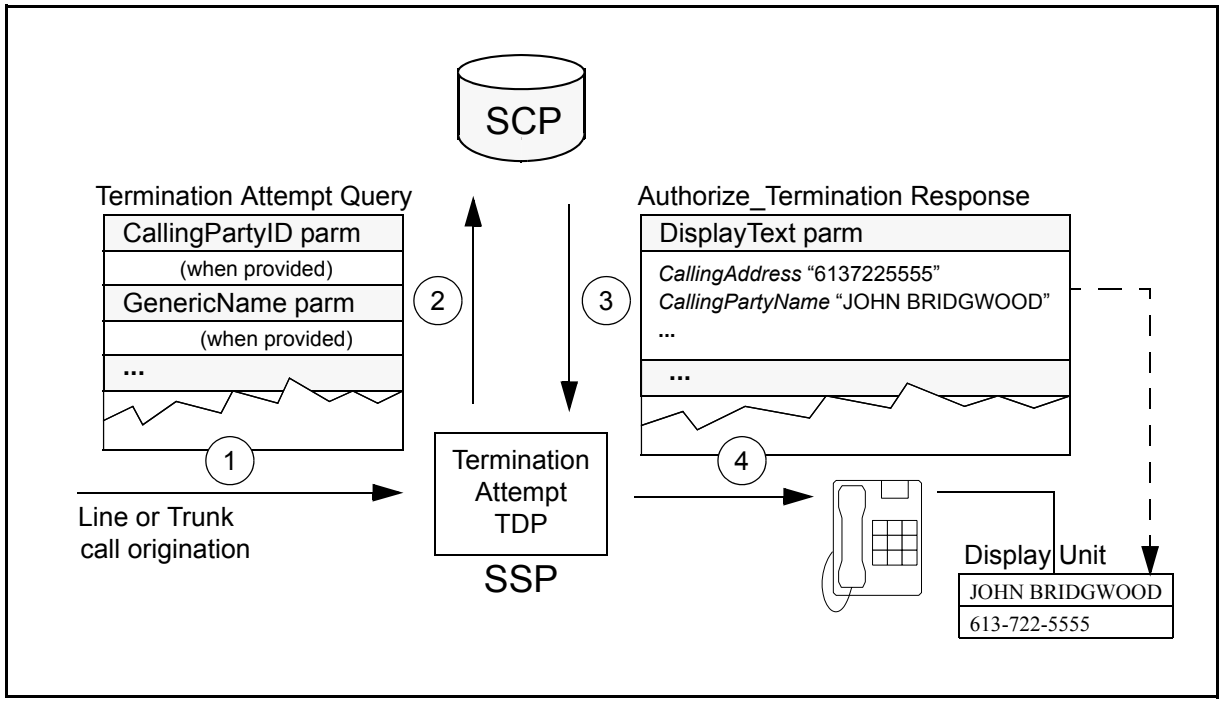
When the DisplayText parameter is included in the Offer_Call message, and the SSP had previously received an Authorize_Termination message that included a DisplayText parameter for the call, the information provided in the Offer_Call message will take priority.

When the DisplayText parameter is received in a message other than these two response messages, the DisplayText parameter is ignored.

Parameter DisplayText can be used by the SSP to supply the calling name, number, and any time-related information that can then be displayed on the customer premise equipment (CPE).

Figure 12 on page 307 illustrates call progression involving parameter DisplayText.

Figure 12 Call progression with DisplayText



The caller can control the presentation status of the calling name or number for displaying to the CPE of the called party by invoking the following feature codes:

- calling number blocking (CNB)
- calling name delivery blocking (CNAB)
- calling number name blocking (CNNB)
- call name/number delivery (CNND)
- calling identity delivery and suppression (CIDS)

The decision to display the calling party name or number is made at the SCP. The permanent presentation status of the calling name or number is assessed at the SCP. The SCP will populate DisplayText parameter with the information that it wants to have displayed on the CPE.

For inter-office calls, these blocking codes are sent to the terminating switch through parameters of the integrated digital network user part's (ISUP) initial address message (IAM) (for example, parameter generic name (GN) for the name and the presentation status of parameter CallingPartyID for the number).

This GN parameter, in turn, is packed into the AIN query (termination attempt query) and sent to the SCP along with the calling party ID (CLID) parameter. The decision on whether or not to display the calling name is made by the SCP (not the SSP).

DisplayText calling number information takes precedence over the number provided in the AIN parameter CallingPartyID, when delivering display information to the terminating agents' customer premise equipment (CPE).

When the callingPartyName field is not provided by the SCP and the reason for its absence is not provided, it is derived from the switch-based display information when it is available. When callingAddress field is not provided by the SCP and the reason for its absence is not provided and the SCP does not send parameter callingPartyId, it is derived from the switch-based display information when it is available. When a callingPartyId is available, it is displayed when there is no callingAddress field included in parameter DisplayText.

6.6.13.13.1 Supported agents and DisplayText fields

A subset of the data fields in parameter DisplayText can be used to display information on the called party's display set.

Table 101 provides a definition for the fields in parameter DisplayText.

Table 101 DisplayText field definitions

DisplayText Field	Definition	Size (ASCII)
callingAddress	Calling party's number[1]	1 to 10 characters
callingPartyName	Calling party's name[2]	1 to 15 characters
reason	Reason for absence (for calling party's name and number)	1 character (O or P)
dateTimeOfDay	Date and time	8 characters

Note 1: Can be a reason for the absence of the calling party number, applicable only for ISDN BRI (1-15 characters).

Note 2: Can be a reason for the absence of the calling party name, applicable only for ISDN BRI (1-15 characters).

Table 102 provides field support information by specific line type for parameter DisplayText. When display text information is received in fields other than those mentioned for specific line types, the information is discarded.

Table 102 AIN DisplayText field support for specific line types

Agent Support		Parameter DisplayText field support
Line type	**Line class code (LCC)**	
RES	1FR	callingPartyName, callingAddress, reason, dateTimeOfDay
	1MR	
IBN	IBN	callingPartyName, callingAddress, reason, dateTimeOfDay
MBS	M5009	callingPartyName, callingAddress, reason
	M5112	
	M5209	
	M5212	
	M5312	
EBS	PSET	callingPartyName, callingAddress, reason
BRI	ISDNKSET	callingAddress[Note3], callingPartyName[Note4], reason
MFT	ISDNKSET	callingAddress, callingPartyName, reason

Note 1: Delivery to RES agents occurs between the first and second ring; when the terminating agent answers the call before delivery is complete, no information is displayed.

Note 2: The dateTimeOfDay information is displayed on RES or IBN agents, after the terminating agent goes on-hook.

Note 3: Can be a reason for the absence of the calling party number; applicable only to ISDN BRI (1-15 characters).

Note 4: Can be a reason for the absence of the calling party name; applicable only to ISDN BRI (1-15 characters).

The cases from Table 103 “Name and Number provided” through Table 114 “Reason for absence provided in callingAddress and reason fields and Name provided” on page 312 illustrate a subset of possible DisplayText field content for supported agents.

Note 1: See Section 6.6.13.13.2 “Analog agent” on page 313 and Section 6.6.13.13.3 “ISDN BRI agent” on page 314 for details on display content for specific agents.

Note 2: In the tables that follow, the displays are not shown exactly as they would be in practice because the table cell sizes does not allow for the correct format. For example, in each cell beneath the headings RES/IBN Display, MBS/EBS Display, and ISDN BRI Display, the cell contains a name and a number. In tables 66 through 77, the name appears on top and the number appears beneath the name. In practice both the name and the number would appear on the same line. For example, the line should appear as John Smith (space) 6137221234 in table 66, in the cell beneath MBS/EBS Display.

Table 103 Name and Number provided

Field	callingAddress	callingPartyName	
Content	"6137221234"	"John Smith"	
RES 1 Line Display	**RES/IBN Display**	**MBS/EBS Display**	**ISDN BRI Display**
613-621-1234	John Smith 613-621-1234	John Smith 6137221234	John Smith 6137221234

Table 104 Reason for absence of Number provided in reason field and Name provided

Field	reason	callingPartyName	
Content	"P"	"John Smith"	
RES 1 Line Display	**RES/IBN Display**	**MBS/EBS Display**	**ISDN BRI Display**
Private Caller	John Smith Private number	John Smith	John Smith Private Number

Table 105 Reason for absence of Name provided in reason field and Number provided

Field	callingAddress	reason	
Content	"6136211234"	"O"	
RES 1 Line Display	**RES/IBN Display**	**MBS/EBS Display**	**ISDN BRI Display**
613-621-1234	Unknown name 613-621-1234	Unknown Name 6136211234	Unknown Name 6136211234

Table 106 Reason for absence of Number provided in callingAddress field and Name provided

Field	callingAddress	callingPartyName	
Content	“Unknown Number”	“John Smith”	
RES 1 Line Display	**RES/IBN Display**	**MBS/EBS Display**	**ISDN BRI Display**
Unknown number	John Smith Unknown number	John Smith	John Smith Unknown Number

Table 107 Reason for absence of Name provided in callingPartyName field and Number provided

Field	callingAddress	callingPartyName	
Content	“6136211234”	“Unknown Name”	
RES 1 Line Display	**RES/IBN Display**	**MBS/EBS Display**	**ISDN BRI Display**
613-621-1234	Unknown name 613-621-1234	Unknown Name 6136211234	Unknown Name 6136211234

Table 108 Reason for absence of Name and Number provided in callingPartyName and callingAddress fields respectively

Field	callingAddress	callingPartyName	
Content	“Private Number”	“Private Name”	
RES 1 Line Display	**RES/IBN Display**	**MBS/EBS Display**	**ISDN BRI Display**
Unknown number	Private Name Unknown number	Private Name	Private Name Private Number

Table 109 Reason for absence of Name provided in reason field and reason of Number provided in callingAddress field

Field	callingAddress	reason	
Content	“Unknown Number”	“O”	
RES 1 Line Display	**RES/IBN Display**	**MBS/EBS Display**	**ISDN BRI Display**
Unknown number	Unknown name Unknown number	Unknown Name	Unknown Name Unknown Number

Table 110 Reason for absence of Name provided in callingPartyName field and reason of Number provided in reason field

Field	reason	callingPartyName	
Content	"O"	"Unknown Name"	
RES 1 Line Display	**RES/IBN Display**	**MBS/EBS Display**	**ISDN BRI Display**
Unknown number	Unknown Name Unknown number	Unknown Name	Unknown Name Unknown Number

Table 111 Number provided only

Field	callingAddress		
Content	"6136211234"		
RES 1 Line Display	**RES/IBN Display**	**MBS/EBS Display**	**ISDN BRI Display**
613-621-1234	switch provided info 613-621-1234	switch provided info 6136211234	switch provided info 6136211234

Table 112 Name provided only

Field	callingPartyName		
Content	"John Smith"		
RES 1 Line Display	**RES/IBN Display**	**MBS/EBS Display**	**ISDN BRI Display**
Unknown number	John Smith switch provided info	John Smith switch provided info	John Smith switch provided info

Table 113 Reason for absence provided

Field	reason		
Content	"P"		
RES 1 Line Display	**RES/IBN Display**	**MBS/EBS Display**	**ISDN BRI Display**
Private caller	Private name Private number	Private Name	Private Name Private Number

Table 114 Reason for absence provided in callingAddress and reason fields and Name provided

Field	callingAddress	reason	callingPartyName
Content	"Unknown Number"	"O"	"John Smith"

Table 114 Reason for absence provided in callingAddress and reason fields and Name provided (Continued)

RES 1 Line Display	RES/IBN Display	MBS/EBS Display	ISDN BRI Display
Unknown number	John Smith Unknown number	John Smith	John Smith Unknown Number

6.6.13.13.2 Analog agent The DisplayText callingPartyName (name), callingAddress (number), reason, and dateTimeOfDay fields are supported for RES and IBN agents.

For calls terminating on RES and IBN subscribers, the reason field is indicated as Out of Area/Unavailable, or Private. The reason field can be either ‘O’ for out of area (or unavailable), or ‘P’ for private. The CPE interprets the ‘O’ or ‘P’ accordingly and displays the respective message corresponding to the indication. When the reason information provided in the reason field is other than ‘O’ or ‘P’, the reason field sent to the CPE is ‘O’ as Out of Area/Unavailable indication. When the callingAddress field received in parameter DisplayText contains characters other than digits, the reason indication ‘O’ is used to indicate the unavailability of the calling number.

For MBS and EBS lines, the DisplayText name, number, and reason fields are supported. A reason for the absence of the CallingAddress is displayed only when there is no AIN provided or switch-based name available and there is no reason for the absence of the name expected in the display. The reason value allowed is either ‘O’ or ‘P’. When the reason value provided in the reason field is other than “O” or “P” it is converted to “O”. The reason information provided in the reason field is converted to a text string indicating unavailability of a name or number based on the reason value. For example strings “UNKNOWN NAME”, “OUT OF AREA” or “PRIVATE” is displayed. The actual text displayed is retrieved from table REASONS after reason ID is matched with the reason value. The maximum number of characters that can be displayed is 15. When the length of the message datafilled in table REASONS exceeds 15 characters the string is truncated to 15 characters.

The following reason IDs is used to represent text strings in table REASONS, that correspond to reason values ‘P’ and ‘O’ for name and number respectively:

- AINRSNNAMEP
- AINRSNNAMEO
- AINRSNNUMBERP
- AINRSNNUMBERO

Figure 13 on page 314 provides sample datafill in table REASONS for reason IDs AINRSNNAMEP and AINRSNNUMBERO.

Figure 13 Sample datafill in table REASONS for reason IDs

```
     REASNSET        REASONID        MESSAGE
-------------------------------------------------------------------
DEFAULTSET           AINRSNNAMEP     PRIVATE_NAME
DEFAULTSET           AINRSNNUMBERO OUT_OF_AREA
```

When the dateTimeOfDay field (that contains the date and time of day information) is included in parameter DisplayText, the information is only used when it contains either the date, the time, or both, otherwise it is ignored.

6.6.13.13.3 ISDN BRI agent For ISDN BRI terminating agents, information received in a CallingAddress tag (both the reason for the absence and a real DN) of parameter AIN DisplayText is delivered in both the calling number information element and CallingAddress tag of the DisplayText information element of the Q.931 message.

The display information received in parameter DisplayText is delivered in a Q.931 Setup message. It can also be delivered in a Notify message when there is a need to update a display after the call has already been answered.

Figure 14 on page 315 provides a call termination flow diagram with Display Text delivered in Q.931 Setup message.

Figure 14 ISDN BRI call termination flow diagram with Display Text delivered in Q.931 Setup message

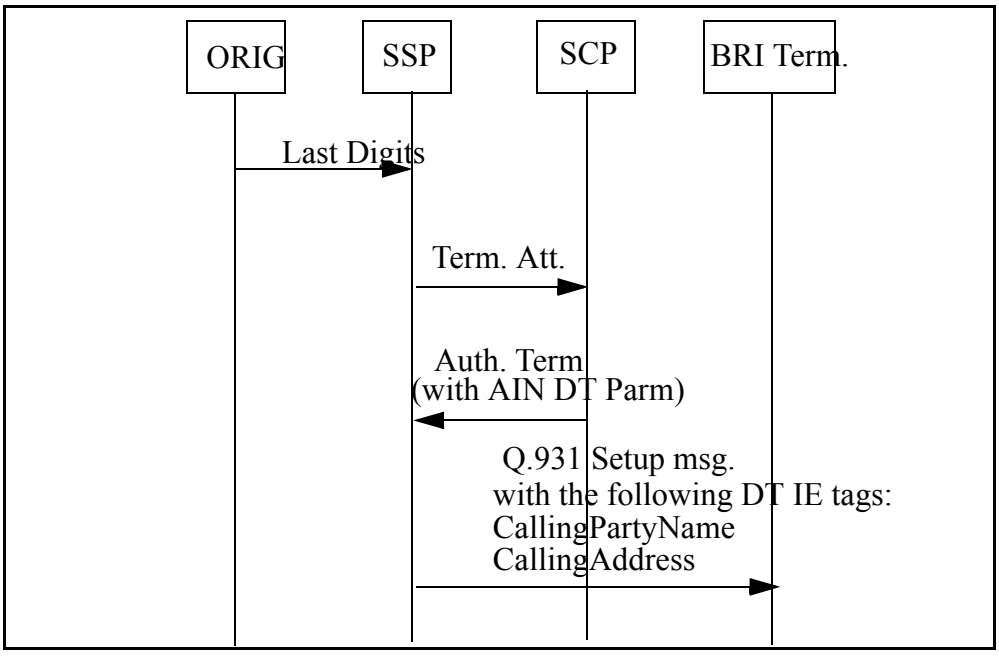
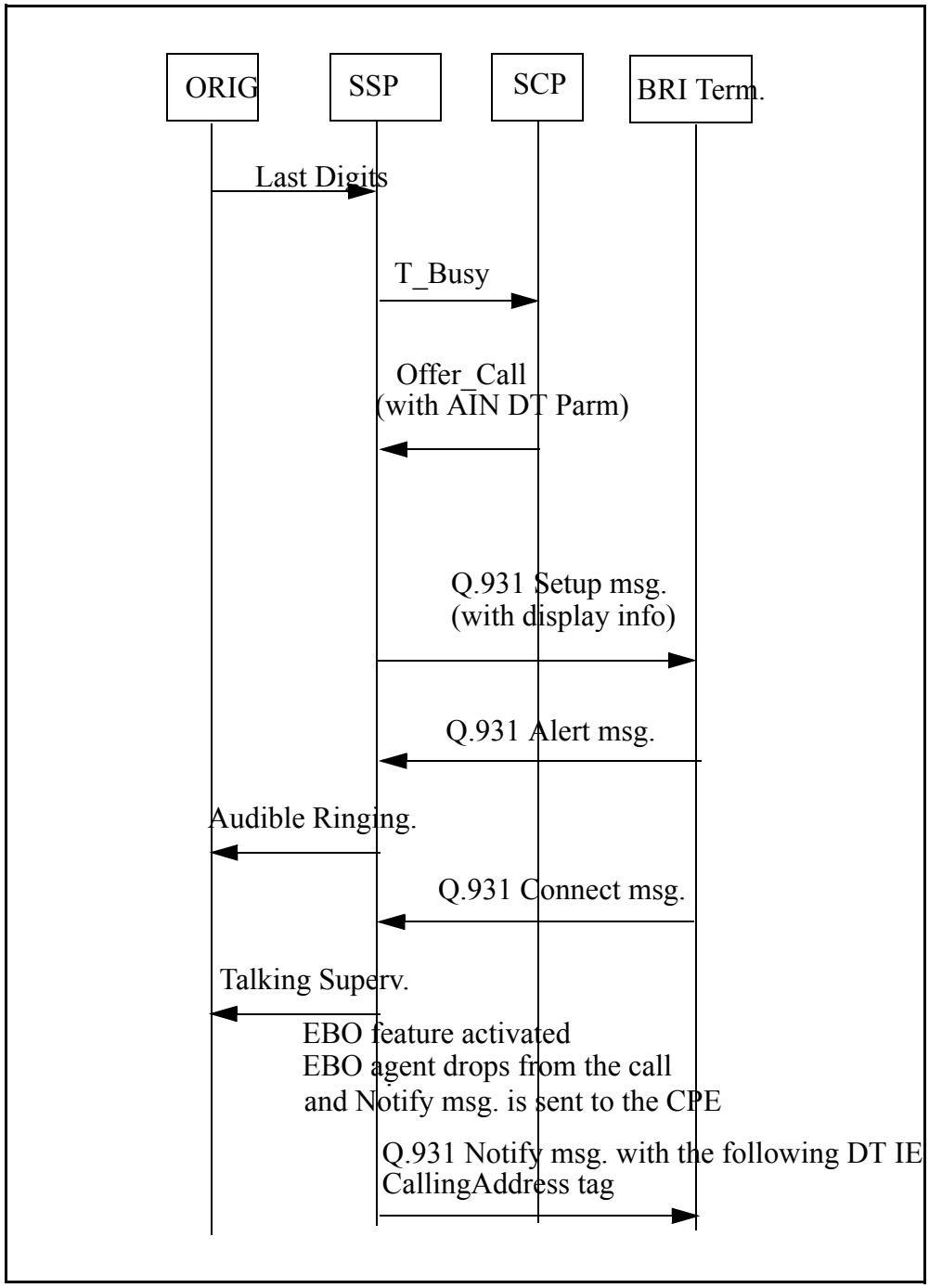


Figure 15 on page 316 provides a call termination flow diagram with Display Text delivered in Q.931 Notify message.

Figure 15 ISDN BRI call termination flow diagram with Display Text delivered in Q.931 Notify message



When the SCP provides a reason for the absence of the calling party number in the callingAddress field and the terminating agent is ISDN BRI, the reason information is displayed on the CPE to indicate the reason for absence of the calling party number. When the SCP provides a reason for absence of the

calling party number in the reason field, the reason information is delivered to the terminating ISDN BRI agent. When the SCP provides a reason for the absence of the calling party number in both fields, callingAddress and reason, the reason information in the callingAddress field is delivered to the terminating ISDN BRI agent.

When the SCP provides a reason for the absence of the calling party name in the callingPartyName field or the reason field, the reason information is delivered to the terminating ISDN BRI agent. When the SCP provides a reason for the absence of the calling party name in both fields, callingPartyName and reason, the reason information in the callingPartyName field is delivered to the terminating ISDN BRI agent.

The only reason value allowed in the reason field is either ‘O’ or ‘P’. When the reason information provided in the reason field is other than “O” or “P” it is converted to the text string corresponding to “O”. The reason information provided in the reason field is converted to a text string indicating the unavailability of a name or number. For example, strings “UNKNOWN NAME”, “OUT OF AREA” or “PRIVATE” are displayed. The actual text displayed is retrieved from table REASONS after reason ID is matched with the reason value. The maximum number of characters that can be displayed is 15. When the length of the message datafilled in table REASONS exceeds 15 characters, the string is truncated to 15 characters. Four new reason ids are added that allow a customer to enter four strings that are displayed to indicate the reason for absence of name or number.

The following reason IDs are used to represent text strings in table REASONS that correspond to reason values ‘P’ and ‘O’ for absence of name and number respectively:

- AINRSNNAMEP
- AINRSNNAMEO
- AINRSNNUMBERP
- AINRSNNUMBERO

Figure 16 on page 318 provides sample datafill in table REASONS for reason IDs AINRSNNAMEP and AINRSNNUMBERO.

Figure 16 Sample datafill in table REASONS for reason IDs AINRSNNAMEP and AINRSNNUMBERO

```
TOP
     REASNSET          REASONID          MESSAGE
-------------------------------------------------------------------------
DEFAULTSET             AINRSNNAMEP       PRIVATE_NAME
DEFAULTSET             AINRSNNUMBERO     OUT_OF_AREA
```

6.6.13.13.4 Feature subscription The terminating party need not subscribe to any switch-based features in order to receive AIN DisplayText information.

6.6.13.14 DPConverter parameter

When the DPConverter parameter is set to "True," Extended DP conversion is started. Both DP and DTMF tones are outpulsed towards the terminator.

When the DPConverter parameter is set to "False," no DP to DTMF conversion is provided. Only DP digits are outpulsed.

When the Collect_Information message with DPConverter parameter set to TRUE is followed by another Collect_Information message with DPConverter parameter set to FALSE then the DP to DTMF conversion is not provided after the speech path is established between the originator and the terminator. The value of the DPConverter parameter in the last Collect_Information message in a call will override the DPConverter parameter in any of the previous Collect_Information messages.

This parameter is controlled by SOC option AIN00292.

6.6.13.15 EDPNotification parameter

Parameter EDPNotification contains several bits; each bit representing a specific Notification. The value of the bit indicates whether the Notification should be armed. A value of 1 indicates to arm the Notification; 0 indicates not to arm the Notification.

The oAnswer (bit 3) is supported. All other Notifications are ignored.

This parameter is controlled by SOC option AIN00210.

6.6.13.16 EDPRequest parameter

Parameter EDPRequest contains several bits; each bit representing a specific Request. The value of the bit indicates whether the Request should be armed. A value of 1 indicates to arm the Request; 0 indicates not to arm the Request.

The DMS-100 switch supports arming tBusy (bit 4), tNoAnswer (bit 5), oCalledPartyBusy (bit 0), oNoAnswer (bit 1) and NetworkBusy (bit 8). All other Requests are ignored.

This parameter is controlled by SOC option AIN00210.

6.6.13.17 ForwardCallIndicator parameter

The ForwardCallIndicator parameter is used by the AIN SSP to update an equivalent parameter, also called ForwardCallIndicator, in the Initial Address Message (IAM) in SS7 (ISUP) signaling. The SS7 ForwardCallIndicator parameter conveys call characteristics and preferences in the forward direction. Forward call information received from the SCP can then be used subsequently in ISUP signaling.

The AIN ForwardCallIndicator parameter differs from the SS7 ForwardCallIndicator parameter in that it has only one field, called the ISDN User Part Preference Indicator. The value returned in this field by the SCP is used to update the ForwardCallIndicator parameter outpulsed in the IAM. This field contains two bits and can have the values shown in Table 115.

Note: The AIN ForwardCallIndicator parameter is mandatory if the GenericAddressList contains a Ported Number Generic Address Type. For details, please refer to *GR-1298-CORE*.

Table 115 ISDN user part preference indicator field values

Value	Definition
00	ISDN User Part preferred all the way
01	ISDN User Part not required all the way
10	ISDN User Part required all the way
11	Spare

The default value is 00.

This parameter is controlled by SOC option AIN00220.

6.6.13.18 GenericAddressList parameter

The GenericAddressList parameter is a single parameter that can contain up to five generic addresses. Each generic address contains

- the address type
- nature of address
- odd/even digit count flag
- a presentation indicator
- a numbering plan indicator
- a string of digits

When an Analyze_Route or Forward_Call message contains a GenericAddressList parameter, the SSP stores each generic address based on the following address types:

- dialed number
- destination number
- supplemental user provided calling address (failed screening)
- supplemental user provided calling address (not screened)
- completion number
- Ported Number
- 800 Service Indicator

> ***Note:*** The Ported Number Generic Address Type requires that the ForwardCallIndicator parameter be set correctly with the M bit set to ‘Number Translated.

When multiple generic addresses are received with the same address type, the SSP only stores in the Generic Address List the first generic address that it receives.

When an unsupported generic address type is received as part of a Generic Address List, the entire address list is disregarded, even when other valid generic address types are contained in the list.

Once stored, the SSP includes the information from each generic address field in a separate ISUP IAM Generic Address Parameter (GAP) when it is terminating to a ISUP agent type.

The generic addresses stored by an SSP from an Analyze_Route or Forward_Call message can be built into a query message when

- a subsequent Info_Analyzed trigger is detected
- a subsequent terminationAttempt trigger is detected
- they are received in a ISUP IAM Generic Address Parameter for a originating ISUP call

The generic addresses stored by an SSP are not available during the Info_Collected detection point unless they were received in a ISUP IAM Generic Address Parameter for a originating ISUP call.

When subsequent triggers are detected, where an Analyze_Route or Forward_Call message is returned containing the GenericAddressList parameter, the generic addresses stored by the SSP are overwritten by the returned Generic Addresses based on the address type.

The GAL is decoded in the following messages:

- analyzeRoute (AR)
- createCall (CC)
- forwardCall (FC)

This parameter is controlled by SOC option AIN00220.

6.6.13.19 NetworkSpecificFacilities parameter

See Section 6.4.4.19.23 “NetworkSpecificFacilities parameter” on page 235 for a more detailed description of this parameter and its fields.

When the NetworkSpecificFacilities parameter is received in an Analyze_Route response message and the call terminates on a PRI trunk, the NetworkSpecificFacilities parameter is sent with the PRI SETUP message.

A NetworkSpecificFacilities parameter received in an Analyze_Route response is ignored when any of the fields contains an invalid or unsupported value or when the call is not Call-By-Call (CBC). The parameter is not outpulsed with the outgoing PRI SETUP message when:

- The service type is ICAN and the terminating agent is NIPRI.
- The service type is ICAN, Hotel/Motel, or SCOCS and the terminating agent is NTNAPRI.
- The service parameter is longer than four IA5 characters.

Note: In case of serial triggering, a valid NSF received with an Analyze_Route response will always be sent in any subsequent Info_Analyzed query.

An Analyze_Route response return that contains an NSF parameter can alter the CBC service requested when the call routes out over NI PRI or NTNA PRI.

This parameter is controlled by SOC option AIN00220.

6.6.13.20 OutpulseNumber parameter

The OutpulseNumber parameter contains the outpulse number for routing over private facilities. It is used when the SSP receives a trunk group parameter with the Number To Outpulse field containing a value of "Outpulse Number".

When the terminating agent is ISUP, the contents of the OutpulseNumber parameter is mapped to the ISDNUP Called Party Number parameter. The Nature of Number field is mapped to the ISDNUP Nature of Address field. The Numbering Plan field is mapped to the ISDNUP Numbering Plan Indication field.

When the terminating agent is a PRI trunk, the OutpulseNumber parameter is mapped to the Q.931 Called Party Number parameter.

When the terminating agent is a trunk not capable of sending either Q.931 or ISDNUP messages, then the contents of the Nature of Number field and the Numbering Plan Indication field are discarded.

When at any point prior to outpulsing, the digits are modified through routing selectors, then the contents of the Nature of Number field and the Numbering Plan Indication field are discarded.

The behavior of the OutpulseNumber parameter varies according the following types of trunks:

- Q764 ISUP trunks—The OutpulseNumber parameter is propagated to the ISUP Called Party Address (CDPA) parameter. A direct mapping is used.
- Q931 PRI trunks—The OutpulseNumber parameter is propagated to the Called Party Number Information Element in the Q.931 Setup message being sent over the PRI trunking facility. No Called Party Subaddress Information Element is included in the Q.931 SETUP message when the OutpulseNumber parameter is to be propagated.
- The format of the OutpulseNumber parameter is the same as the CallingPartyID parameter format shown in Section 6.6.13.5 "CallingPartyID parameter" on page 299 except that the Presentation and Screening Restriction Indicator fields are spares.

- Table 116 shows the format of the Called Party Number information element.

Table 116 Format of Called Party Number information element

H	**G**	**F**	**E**	**D**	**C**	**B**	**A**
0	1	1	1	0	0	0	0
Length of Information element (octets)							
1 Ext.	Type of Number			Number Plan ID			
Spare	Digits (IA5 Characters)						

- Table 117 through Table 119 illustrate the mapping of the OutpulseNumber parameter to the Called Party Number information element.

Table 117 Parameter to information element mapping

OutpulseNumber parameter	Called Party Number information element	Mapping
nature of number	type of number	generated by DMS SSP
numbering plan	numbering plan ID	generated by DMS SSP
address digits	digits	direct mapping

Table 118 Numbering plan to numbering plan ID mapping

Numbering plan	Numbering plan ID
ISDN Numbering Plan 0001	ISDN Numbering Plan (Rec. E164) 001
Private 0101	Private 101
Otherwise	Unknown 000

Table 119 Nature of number to Type of number mapping

Nature of Number	Type of Number
International Number 0000100	International Number 0001
National Number 0000011	National Number 0010
Local Number 00000001	Local Number 0100
Otherwise	Unknown 0000

- PTS trunks—The Called digits outpulsed over the trunk is the contents of the OutpulseNumber parameter.

6.6.13.21 Prefix parameter

The Prefix parameter is valid for the Analyze_Route and Forward_Call response messages. Parameter Prefix indicates to the SCP that “1+” type of call has been encountered on the SSP.

6.6.13.22 PrimaryTrunkGroup parameter

Parameter PrimaryTrunkGroup is one of three trunk group parameters used to specify an SSP route list to attempt to terminate the call on. See Section 6.6.13.1 “AlternateTrunkGroup parameter” on page 294 for details.

6.6.13.23 RedirectingPartyID parameter

The RedirectingPartyID parameter specifies the last redirecting party.

Call processing treats the call as a redirected call when it receives an Analyze_Route message with a RedirectingPartyID parameter. When the Analyze_Route message does not contain a RedirectingPartyID parameter, the call is not treated as a redirected call.

In contrast, the Forward_Call message actually redirects the call. With AIN Service Enablers, the SCP can return a RedirectingPartyID in a Forward_Call response that is different from the DN on that the TAT trigger occurred. The SSP then uses the returned redirecting party in subsequent signaling. When a RedirectingPartyID is not received in a Forward_Call message, the DN upon that the TAT trigger occurred is used as the redirecting party.

> ***Note:*** This parameter is not currently propagated when terminating to Q764 ISUP or Q931 PRI trunks. Similarly, it has no effect on the Redirection Counter sent over either ISUP or PRI facilities. It is, however, used when terminating to an SMDI interface.

See also Section 6.2.4.1 “Serial triggering and redirection parameters” on page 198.

This parameter in the Forward_Call response message is restricted to AIN Service Enablers.

6.6.13.24 RedirectionInformation parameter

The RedirectionInformation parameter gives the reason of both the original redirection and the last redirection on the call as well as a count of the total number of redirections on the call. Valid redirection reasons are:

- unknown/not available
- user busy
- no reply
- unconditional

The redirection count can range from 0 to 10. The returned redirection count does not account for the current redirection being processed. It is the responsibility of the SSP to increment the count by one after processing the AIN redirection.

With the RedirectionInformation response parameter in AIN Service Enablers, the SCP can specify different redirection reasons for AIN-caused redirections. Additionally, the RedirectionInformation parameter gives the SCP control of the redirection count. AIN Service Enablers does not allow the SCP to decrement the redirection counter. When the returned redirection counter is greater than or equal to the pre-query redirection count, the returned value is used in subsequent signaling. Otherwise, the pre-query counter value is used.

When an Analyze_Route message is received with a RedirectingPartyID but no RedirectionInformation parameter or a RedirectionInformation parameter is not received in a Forward_Call message, the reason associated with the AIN redirection defaults to 'unconditional' and the SSP redirection counter value is used.

See also Section 6.2.4.1 "Serial triggering and redirection parameters" on page 198.

This parameter is controlled by SOC option AIN00220.

6.6.13.25 ResourceType parameter

This parameter indicates the type of resource to that the user is connected. The only applicable values are "Play Announcement" and "Play Announcement and Collect Digits".

This parameter coded to "Play Announcement" must be present in a Response package with a Send_To_Resource operation. Otherwise, it is treated as a fatal erroneous data value error. In a Conversation Package, it must be coded to "Play Announcement and Collect Digits".

6.6.13.26 SecondAlternateTrunkGroup parameter

The SecondaryAlternateTrunkGroup parameter is one of three trunk group parameters used to specify a SSP route list to attempt to terminate the call on. See Section 6.6.13.1 "AlternateTrunkGroup parameter" on page 294.

6.6.13.27 TCM parameter

The TCM parameter contains the travelling class mark for the user. This parameter is optionally sent by the SCP or adjunct.

The AINDigits format is used with the following fields:

- nature of number is set to "not applicable".
- numbering plan is set to "unknown or not applicable".
- the digits field contains a TCM of up to two digits.

Parameter TCM can be received in the following SCP-to-SSP response messages: Analyze_Route, Forward_Call, and Authorize_Termination. When

a TCM value is returned in these messages, it is used to populate TCM in subsequent outgoing queries.

6.6.13.28 GenericName parameter

The GenericName parameter is based on the ISDNUP Generic Name (GN) parameter and contains the following field values:

- Presentation
- Availability
- Type of name

The GenericName is decoded in the following response messages:

- AnalyzeRoute (AR)
- AuthorizeTermination (AT)
- ForwardCall (FC)
- OfferCall (OC)

When the Generic Name is received in the response from SCP, GenericName is populated

- in queries sent to the SCP when a particular trigger is encountered,
- in the ISUP IAM message if the call terminates on an ISUP trunk,
- in the NAME information if the call terminates on PRI/BRI.

When a Display_Text parameter containing CallingPartyName is received in Authorize_Termination reponse for Trunk_Group_Trigger, and the Generic Name parameter is not available, then the ISDNUP Generic Name parameter is populated in the outgoing IAM.

The presentation sub-field of GenericName is used to determine the calling name information to be presented to the calling party.

The GenericName received in response from the SCP overrides the GenericName received in an earlier response, the GenericName received in the ISUP IAM (ISUP protocol), or the NAME information (PRI/BRI).

The GenericName parameter is controlled by SOC option AIN00220.

6.7 Non call-related response message processing

This function provides the SSP with transaction and component level procedures for sending non call-related messages. The non call-related messages can be sent in both a response and conversation package when accompanied by a call related message.

6.7.1 Send_Notification message

The Send_Notification (SN) message is allowed in a conversation package. When the SSP receives a Send_Notification message with a Send_To_Resource or a Call_Info_To_Resource message and the call is answered, the SSP sends a Termination_Notification message to the SCP after the call goes to the NULL PIC. The Termination_Notification message to the SCP contains the following information:

- the AnswerIndicator field of parameter TerminationIndicator is set to "yes"
- parameter ConnectTime contains the length of time the connection was made to the terminating agent

When multiple Send_Notification messages are received during one transaction, only the last Send_Notification message is retained. All other Send_Notification messages received in the same transaction are ignored.

When the SSP receives a Send_Notification message in a response to a T_Busy message, the Termination Notification is sent immediately to the SCP, since the call will encounter the NULL Point In Call.

As in AIN Essentials, a Send_Notification message is not allowed in conjunction with a Disconnect message.

Table 120 lists the parameters that make up the Send_Notification message.

Table 120 Send_Notification message parameters

Parameter	Description
EchoData	See Section 6.7.3.1 on page 329.
ExtensionParameter	
Note: Parameters in shaded areas are not supported in this message for this release.	

6.7.2 Termination_Notification message

Table 121 lists the parameters that make up the Termination_Notification message.

Table 121 Termination_Notification message parameters

Parameter	Description
Amp1	
Note: Parameters in shaded areas are not supported in this message for this release.	

Table 121 Termination_Notification message parameters (Continued)

Parameter	Description
Amp2	
BusyCause	See Section 6.4.4.19.5 on page 221.
ConnectTime	Functionality inherited from AIN Essentials.
EchoData	See Section 6.7.3.1 on page 329.
ExtensionParameter	
TerminationIndicator	Functionality inherited from AIN Essentials.
Note: Parameters in shaded areas are not supported in this message for this release.	

Note: ACG overflow notification is not provided by a Termination_Notification message, but is instead provided by a unidirectional message.

6.7.3 Non call-related response message parameters

The following sections describe non call-related response message parameters.

6.7.3.1 EchoData parameter

The contents of the EchoData parameter is SCP dependent. The SSP only checks the length of the parameter to ensure it is 6 octets long. When the length is incorrect, a fatal application error of Erroneous Data Value is raised.

6.8 AIN software coexistence requirement

This section describes the implementation of the AIN Software Coexistence Requirement FSS.

This function provides the capability for multiple AIN software releases on a given SSP to be reached using the same subsystem number.

Regardless of whether triggers are datafilled as R01 or R02 in the AIN trigger tables, the same SS7 subsystem number is used to route the AIN messages.

6.9 Alternate carrier routing

Alternate carrier routing allows the SSP to attempt to send AIN calls to the next available SCP-provided route, when network congestion is detected after the call has been routed out of the SSP (once a remote Network Busy condition is detected). This functionality is supported when the outgoing trunks are ISUP.

Alternate carrier routing does not apply when the call is sent through a virtual facility group (VFG) as a result of processing an AIN response, even when the call subsequently routes over ISUP. In other words, when translation of an Analyze_Route , Forward_Call, or Send_To_Resource response causes the call to go through a VFG, then through an ISUP trunk, AIN processing does NOT attempt any further routes once the call is sent out over the ISUP trunk.

Note 1: This restriction does not affect processing of a Network_Busy EDP-R (the Network_Busy EDP-R can be detected on calls that route through a VFG).

Note 2: The pre-query routing through a VFG does not have restrictions with alternate carrier routing functionality.

The Analyze_Route, Forward_Call, or Send_To_Resource response from the service control point (SCP) or adjunct, provides the SSP with a list of up to three trunk groups and up to three carriers, as potential call routes. A trunk group or a carrier parameter is referred to as a route.

After receiving an Analyze_Route, Forward_Call or Send_To_Resource response from the SCP or adjunct, the SSP attempts to route the call over the routes as specified by GR-1298.

When the SSP is unable to send a call over a route because it is local network busy, and there are untried routes remaining in the Analyze_Route, Forward_Call, or Send_To_Resource response message, the SSP attempts to send the call over the next route specified in that Analyze_Route, Forward_Call or Send_To_Resource response.

When a call is routed over an outgoing ISUP trunk and there are untried routes remaining in the Analyze_Route, Forward_Call or Send_To_Resource response message, AIN processing waits until one of the following messages is received from another SSP:

- When an ISUP release message is received that indicates the call could not complete due to a busy remote network resource, then the SSP attempts to route the call over the next route specified in the Analyze_Route, Forward_Call or Send_To_Resource response message. Release cause values considered to indicate this “Network Busy” condition are listed in Table 122 on page 333.
- When an ISUP ACM message, a Busy Station message or a release message with a cause value other those specified in Table 122 on page 333 is received, then AIN processing terminates and normal call processing takes place.

When a call is routed over an outgoing ISUP trunk, and there are no untried routes remaining in the Analyze_Route, Forward_Call or Send_To_Resource

response message, AIN processing terminates and normal call processing resumes.

When a route is specified that uses an outgoing VFG, AIN processing terminates once the VFG is seized, and normal call processing takes place.

Once normal call processing has resumed, then Network_Busy event detection can occur (when it is armed), as described in Section 8.3.2 “Network_Busy event detection” on page 384.

See Figure 17 on page 332. The functionality that is illustrated applies only to calls routed over trunks, including trunks that access carriers.

6.9.1 Controlling route using parameter AIN_ALT_ROUTE_SEL

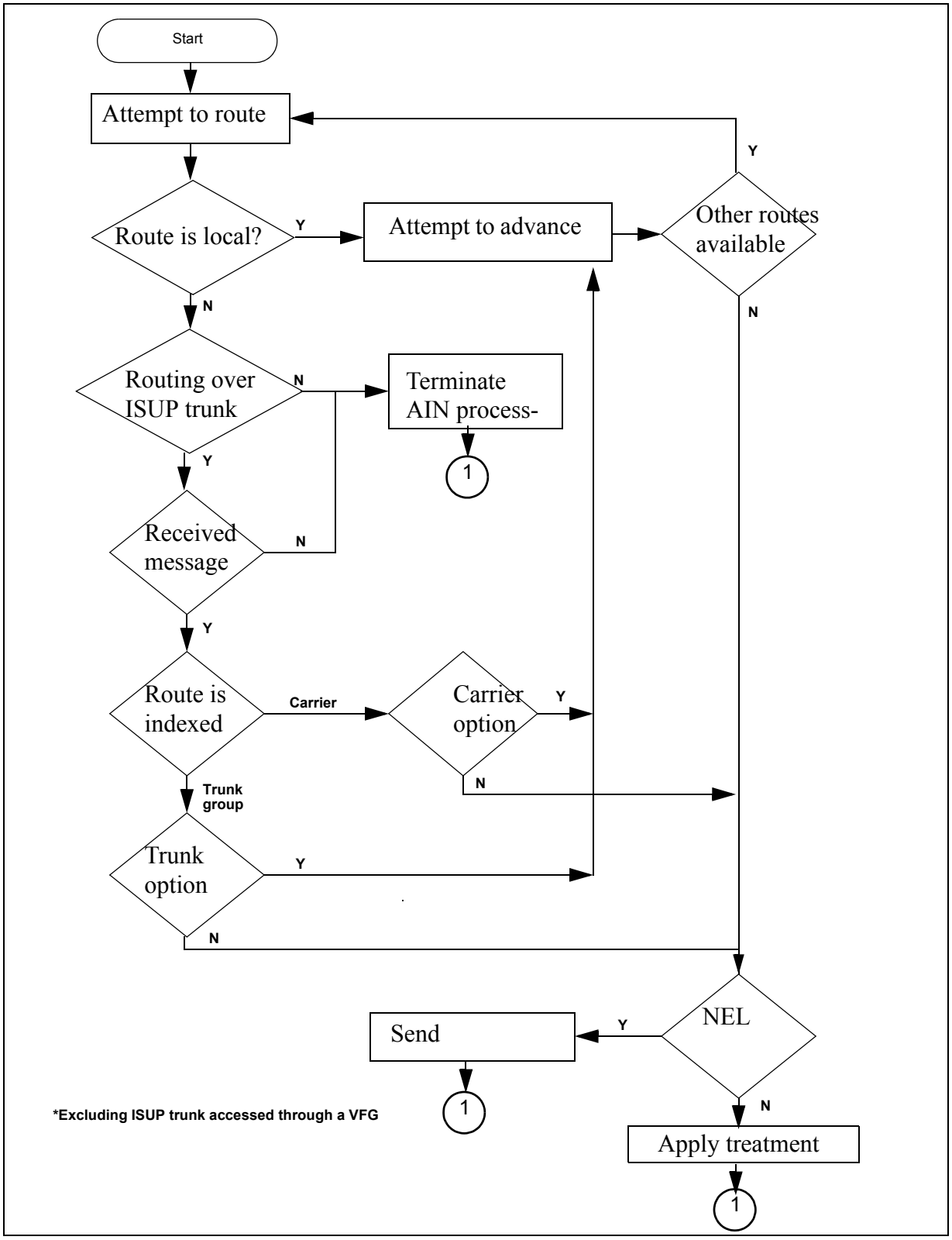
When the SSP attempts to route a call over a trunk group parameter or a carrier parameter included in an Analyze_Route, Forward_Call or Send_To_Resource response and then detects a remote Network Busy condition, it attempts to perform one the following:

- when the option corresponding to the current route (either trunk group or carrier) is in the “enabled” state, the SSP attempts to route to any subsequent route in the Analyze_Route, Forward_Call or Send_To_Resource response.
- when the option corresponding to the current route (either trunk group or carrier) is in the “disabled” state, the SSP behaves as when no more routes are available.

The options have no effect when a local Network Busy condition is detected while routing the call. See Figure 17 on page 332. The functionality that is illustrated applies only to calls routed over trunks, including trunks that access carriers.

For more information about office parameter AIN_ALT_ROUTE_SEL see Section 12.2.1 on page 473.

Figure 17 Functional flowchart of alternate carrier routing



6.9.2 Network Busy detection

A local Network Busy condition is detected when the Analyze_Route or Forward_Call response processing attempts to route the call over a busy route.

A remote Network Busy condition is detected when the Analyze_Route or Forward_Call response processing and routing

- has successfully seized an outgoing ISUP trunk, and
- receives a message from a remote SSP with the cause value indicating Network Busy

See Table 122 for CCITT cause values indicating Network_Busy.

Table 122 CCITT cause values indicating Network Busy

ISUP cause value	Description
3	No route to destination
25	(ANSI) Exchange routing error
34	No circuit or channel is available
38	Network out of order
41	Temporary failure
42	Switching equipment congestion
47	Resource unavailable, unspecified
95	Invalid message, unspecified
102	Recovery on timer expiry
111	Protocol error, unspecified
127	Interworking, unspecified

Table 123 shows two additional ISUP causes that are also included in R5-28 [2468] in GR-1298, Issue 3, Revision 1. Since they apply to the user facility rather than the network, they are not interpreted as “Network Busy”.

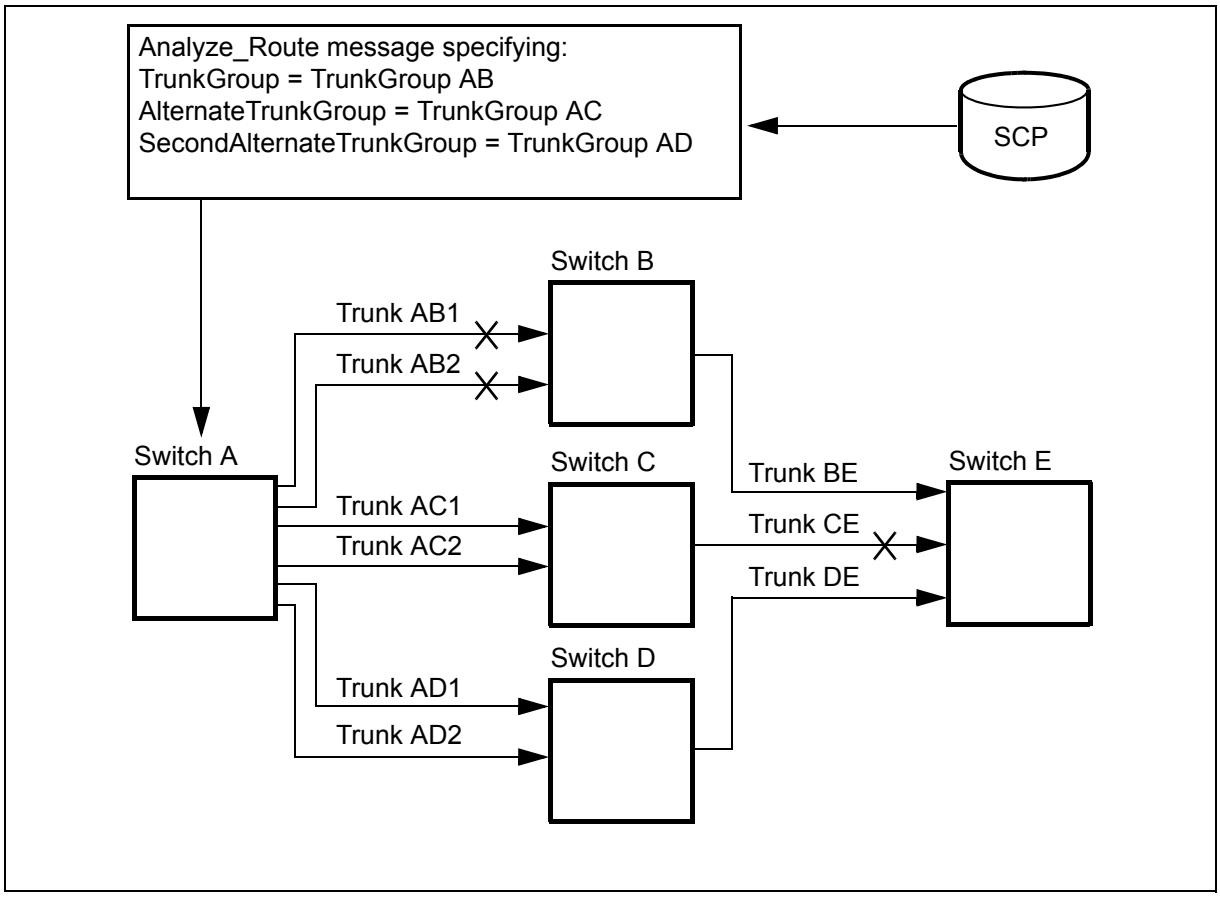
Table 123 ISUP Cause values not indicating Network Busy

ISUP Cause value	Description
27	Destination out of order
29	Facility rejected

6.9.3 Alternate carrier routing with multiple trunk groups

The following scenario illustrates alternate carrier routing when multiple trunk groups are specified in the Analyze_Route or Forward_Call response message. In this scenario, trunk groups must be ISUP trunks.

Figure 18 Alternate carrier routing with multiple trunk groups



1. The SCP sends an Analyze_Route response message specifying alternate and second alternate trunk groups to switch A.
2. Switch A attempts to route the call over the primary trunk group, for example trunk group AB.
3. All members of trunk group AB are busy; that is, experiencing a local Network Busy condition. Switch A attempts to route the call over the alternate trunk group.
4. Trunk AC1 is idle, so the termination on switch C succeeds.
5. Switch C attempts to terminate the call on switch E.
6. Trunk CE is busy; that is, experiencing a remote Network Busy condition. A release message with cause 3 is sent to switch A.

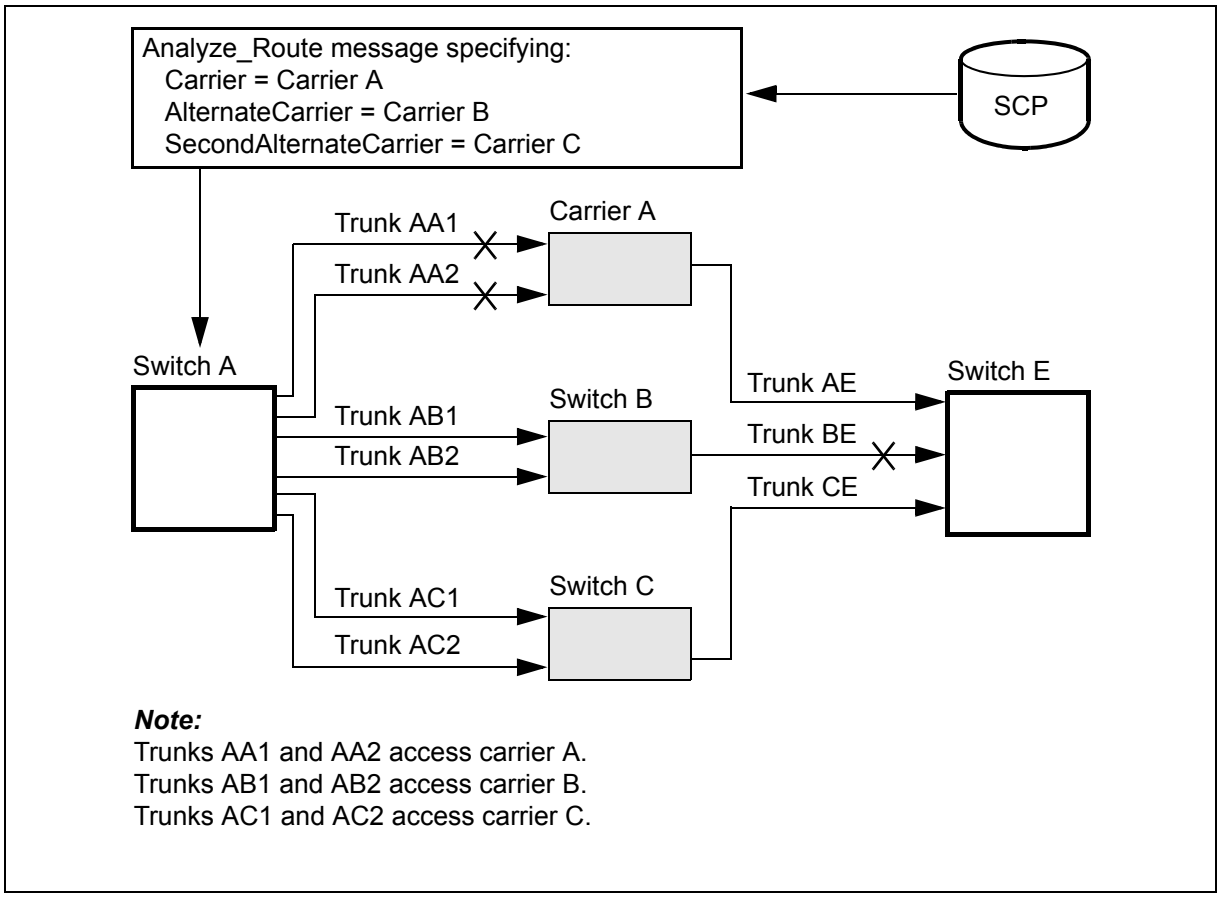
7. Switch A receives the release message and attempts to route the call over the second alternate trunk group.
8. Trunk AD1 is idle, so the termination on switch D succeeds.
9. Switch D attempts to terminate the call on switch E.
10. Trunk DE is idle, so the termination on switch E succeeds.

6.9.4 Alternate carrier routing with multiple carriers

WARNING
When a call encounters an AIN trigger and receives an Analyze_Route response with multiple routes and one of the routes contains an announcement that is datafilled with an S selector and the call connects to that announcement, then Analyze_Route processing terminates.

The following scenario illustrates alternate carrier routing when multiple carriers are specified in the Analyze_Route or Forward_Call response message. In this scenario, trunk groups must be ISUP trunks.

Figure 19 Alternate carrier routing with multiple carriers



1. The SCP sends an Analyze_Route response message specifying the carrier, alternate carrier and second alternate carrier to switch A.

   Note: When parameter CarrierUsage is present, carriers are selected based on the CarrierUsage algorithm. See Chapter 41.3.1: "CarrierUsage algorithm for SSP routing" on page 958.

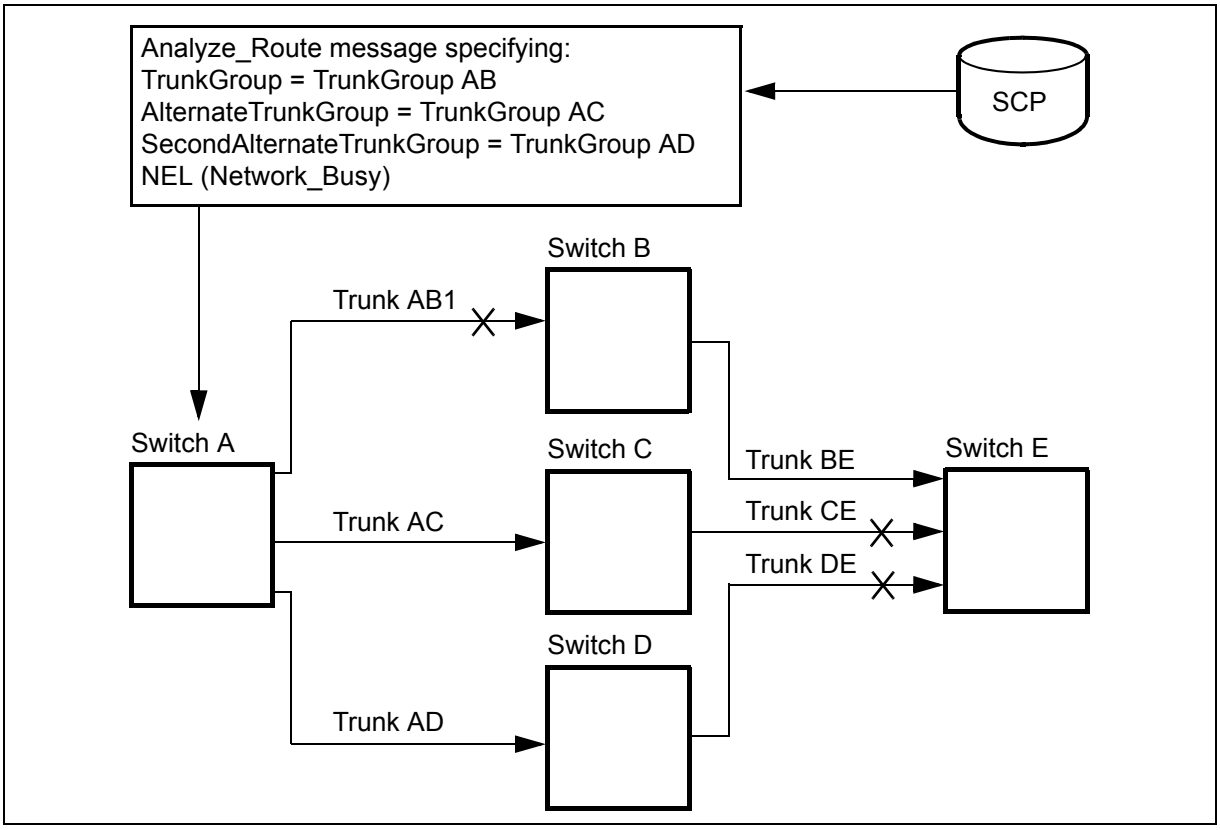
2. Switch A attempts to route the call over the carrier.
3. Trunk AA1 and trunk AA2 are both busy, so switch A attempts to route the call over the alternate carrier.
4. Trunk AB1 is idle, so the termination on carrier B succeeds.
5. Carrier B attempts to terminate the call on switch E.
6. Trunk BE is busy, so a release message with cause 3 is sent to switch A.
7. Switch A receives the release message, skips the second trunk (AB2) on carrier B and attempts to route the call over the second alternate carrier.
8. Trunk AC1 is idle, so the termination on carrier C succeeds.

9. Carrier C attempts to terminate the call on switch E.
10. Trunk CE is idle, so the termination on switch E succeeds.

6.9.5 Alternate carrier routing with an active NEL

This scenario illustrates alternate carrier routing with an active AIN Service Enablers Network_Busy event. In this scenario, trunk groups are ISUP trunks.

Figure 20 Alternate carrier routing with Network_Busy event



1. The SCP sends an Analyze_Route response specifying, alternate and second alternate trunk groups to switch A. The Network_Busy Requested Event is included in the response.
2. Switch A attempts to route the call over the trunk group.
3. Trunk AB is busy, so switch A attempts to route the call over the alternate trunk group.
4. Trunk AC is idle, so the termination on switch C succeeds.
5. Switch C attempts to terminate the call on switch E.
6. Trunk CE is busy, so a release message with cause 3 is sent to switch A.

7. Switch A receives the release message. The Network_Busy EDP is not encountered and switch A attempts to route the call over the second alternate trunk group.
8. Trunk AD is idle, so the termination on switch D succeeds.
9. Switch D attempts to terminate the call on switch E.
10. Trunk DE is busy, so a release message with cause 3 is sent to switch A.
11. Switch A receives the release message. The Network_Busy EDP is encountered and a Network_Busy EDP-R message is sent to the SCP.

7 Originating call model triggers

7.1 Overview

This chapter describes AIN Service Enablers' implementation of the following originating call model (OCM) triggers:

- Off-Hook_Immediate
- Off-Hook_Delay
- Channel_Setup_PRI
- Shared_Interoffice_Trunk
- Specific_Feature_Code
- Public_Feature_Code
- Office_Public_Feature_Code
- Customized_Dialing_Plan
- Specified_Carrier
- One_Plus_Prefix
- International
- Operator_Services
- Specific_Digit_String
- N11
- Automatic_Flexible_Routing
- O_Called_Party_Busy
- O_No_Answer

Refer to chapter 4 "Agent support" for information regarding agent support. Refer to chapter 6 "Generic SSP procedures" for information regarding SCP responses. Refer to chapter 34 "Software optionality control" for SOC code information. Refer to chapters 41 "Off-Hook Immediate trigger" to 56 "O_No_Answer trigger" for provisioning information.

7.2 Off-Hook_Immediate trigger

This section describes trigger Off-Hook_Immediate.

7.2.1 Product view

Trigger Off-Hook_Immediate implements the Off-Hook_Immediate Trigger FS.

AIN Service Enablers implements the Off-Hook_Immediate trigger according to GR-1298 and GR-1299. he Off-Hook_Immediate trigger uses the Origination_Attempt message to query the SCP. See Section 6.4.4.1 “Origination_Attempt trigger request message” on page 202.

7.3 Off-Hook_Delay trigger

This section describes the Off-Hook_Delay (OHD) trigger.

7.3.1 Product view

The Off-Hook_Delay trigger implements the Off-Hook_Delay Trigger FS.

The Off-Hook_Delay trigger occurs at the Info_Collected TDP in the AIN Originating Call Model (OCM). OHD is a subscribed trigger that can be assigned to

- Direct Inward System Access (DISA) numbers
- POTS, RES, and IBN lines
- incoming PRI trunks and IBN trunks

AIN Service Enablers implements trigger Off-Hook_Delay according to GR-1298 and GR-1299.

7.4 Channel_Setup_PRI trigger

This section describes trigger Channel_Setup_PRI that provides the functionality for trigger PRIB.

All North American primary rate interface (PRI) variants NTNAPRI, NIPRI, U449PRI, and U459PRI, support trigger PRIB.

7.4.1 Product view

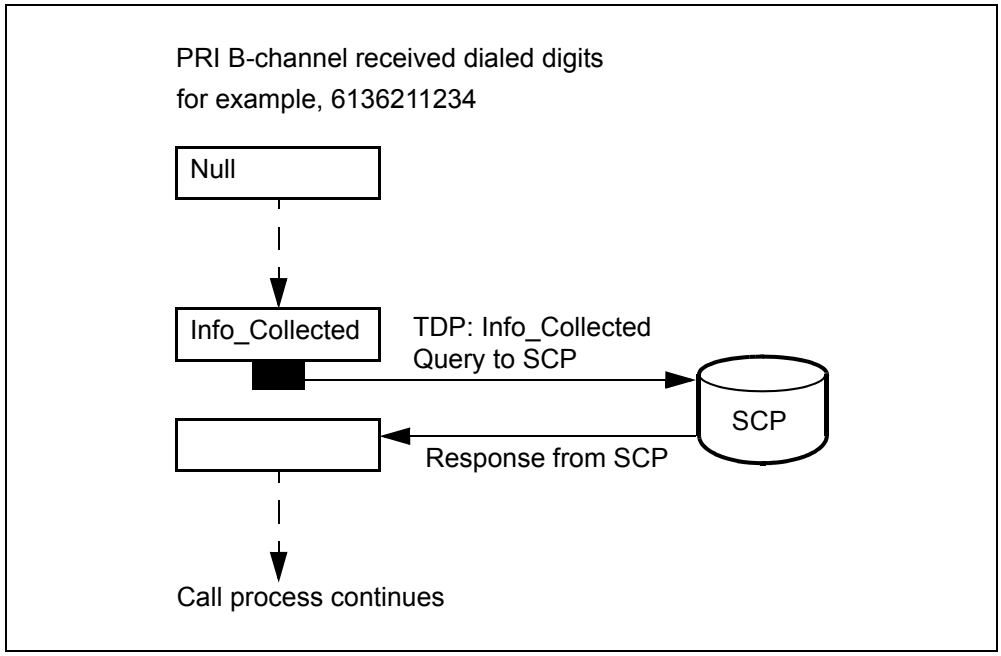
Trigger Channel_Setup_PRI implements the Channel_Setup_PRI trigger FS.

Trigger PRIB occurs at the Info_Collected TDP and is assignable to a dedicated B-channel on a PRI interface. All calls originated from a PRI B-channel with a trigger PRIB subscription, trigger at the Info_Collected TDP, except that trigger PRIB would not be encountered when the caller dials an escape code that is in table TIESCDIG. An escape code can be a dialed for switched based feature activation and deactivation codes that do not result in

a call or a designated escape code datafilled in table TIESCDIG. Some examples of an escape code are the deactivation code for Call Forwarding and 911.

See Figure 21 for the call flow of a typical PRIB-triggered call.

Figure 21 PRIB call example



7.4.2 Info_Collected message and processing

When the AIN SSP encounters trigger PRIB with all criteria met (that is, the dialed digits are not an escape code in table TRIGDIG), the SSP sends an Info_collected TDP - Request message to the SCP or adjunct. See Section 6.4.4.2 “Info_Collected trigger request message” on page 203.

The SSP can receive any of three possible messages from the SCP or adjunct as a response:

- Analyze_Route
- Disconnect
- Send_To_Resource
- Continue

7.4.3 Interactions

Trigger PRIB interacts with two B-channel transfer within AIN and with the DMS-100 switch. See Section 1.16.2 “Two B-channel transfer” on page 133.

7.5 Shared_Interoffice_Trunk trigger

This section describes the Shared_Interoffice_Trunk trigger.

7.5.1 Product view

The Shared_Interoffice_Trunk trigger implements the Shared_Interoffice_Trunk trigger FS.

AIN Service Enablers implements the Shared_Interoffice_Trunk trigger according to GR-1298 and GR-1299.

7.6 Specific_Feature_Code trigger

This section describes the Specific_Feature_Code (SFC) trigger.

SFC is an individually subscribed trigger that allows a user to dial specific feature codes or vertical service codes that are unique for their line. By dialing the code, the user causes the SSP to detect the SFC trigger and query the SCP or adjunct to obtain further routing instructions that are related to the specific feature.

7.6.1 Product view

The Specific_Feature_Code trigger implements the Specific_Feature_Code Trigger FS.

The Specific_Feature_Code trigger consists of the following functions:

- SFC trigger detection and processing
- Info_Analyzed message and processing
- Analyze_Route message and processing
- Continue message and processing
- Disconnect message and processing
- Send_To_Resource message and processing

The precedence between the SFC trigger and Public_Feature_Code trigger depends on the order of digits criteria datafill in the TRIGDIG table.

7.6.2 SFC trigger detection and processing

This section describes the implementation of the SFC Trigger Detection FSS.

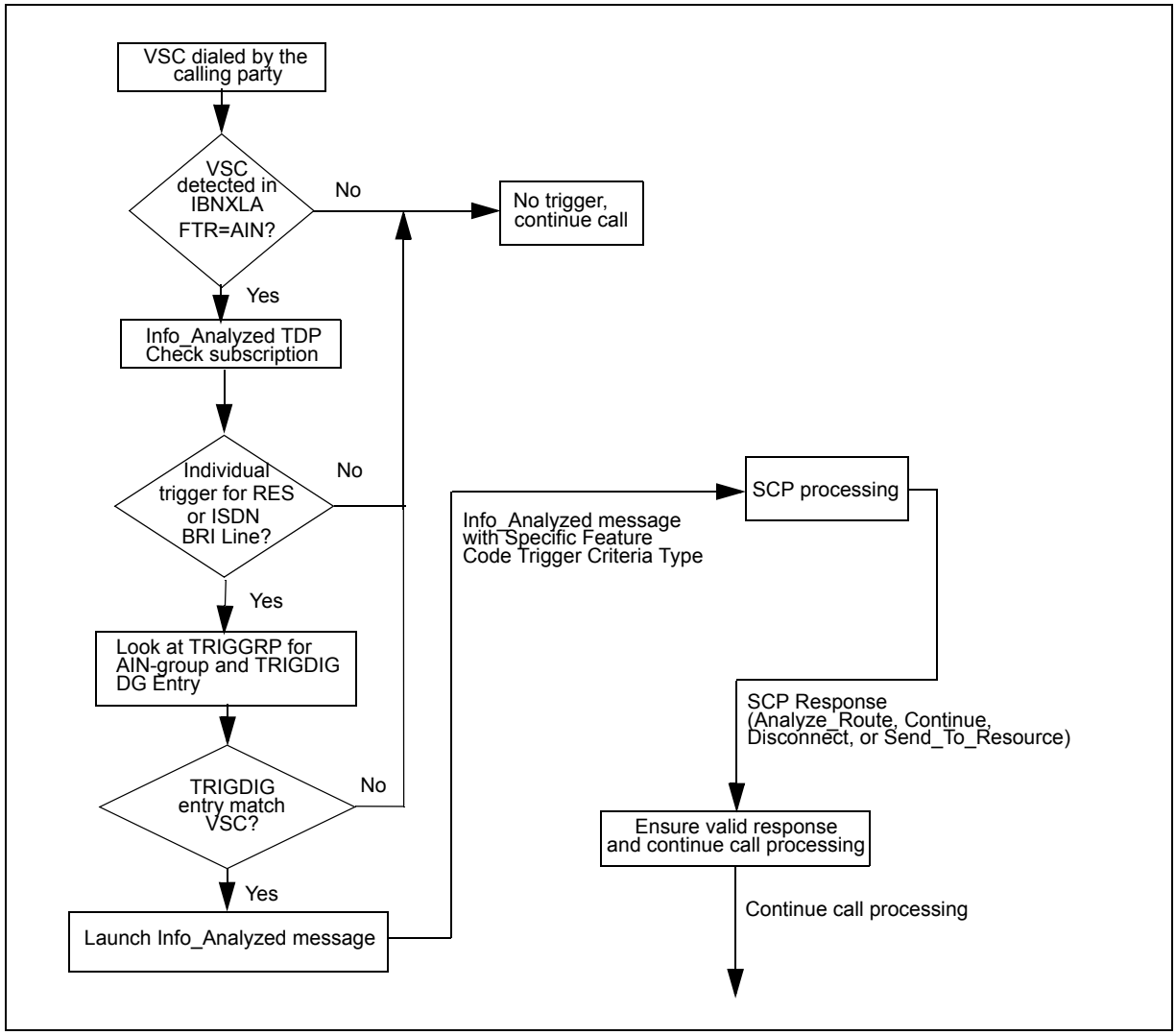
The SFC trigger is detected at the Info_Analyzed TDP of the AIN Originating Call Model (OCM). The SFC trigger uses SCP vertical service codes (VSC) as its mandatory trigger criteria. By assigning the appropriate VSCs in table IBNXLA or XLNAME, the user can define a suite of SCP services that are specific to the VSC dialed. A VSC can be one to seven digits, with the first

digit being either an asterisk (*) or octothorpe (#). For dial pulse lines, the leading asterisk or octothorpe is excluded.

The call flow of the typical SFC-triggered call follows. See Figure 22.

- The VSC dialed by the caller is found in table IBNXLA with FTR AIN.
- The Info_Analyzed TDP checks for an active SFC trigger.
- RES or BRI subscription and VSC digits criteria are validated.
- The Info_Analyzed message is sent to the SCP.
- An Analyze_Route, Continue, Disconnect or Send_To_Resource response is received and continues call processing.

Figure 22 SFC trigger call flow



7.6.2.1 Option AINDENY

Option AINDENY excludes triggering on individual lines when the SFC trigger is subscribed on the customer group. This line option provides a way of excluding individual lines from triggering for:

- particular trigger item IDs of SFC trigger type
- all group-subscribed trigger items of SFC trigger type

7.6.3 Info_Analyzed message and processing

This section describes the implementation of the SFC/Info_Analyzed Message and Processing FSS.

Once the criteria for the SFC trigger are validated, the SSP sends the Info_Analyzed message to the SCP or adjunct. See Section 6.4.4.3 “Info_Analyzed trigger request message” on page 204.

Note that the following parameters have specific values when the Info_Analyzed message is generated as a result of detecting the SFC trigger:

- TriggerCriteriaType, which differentiates the SFC trigger from similar triggers such as AIN Essentials’ PODPFEAT or CDP trigger
- UserID, which contains the DN of the calling party
- VerticalServiceCode, which contains the VSC digits

7.6.4 Analyze_Route message and processing

This section describes the implementation of the Generic Analyze_Route Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Analyze_Route message. See Section 6.6.1 , “Analyze_Route message,” on page 258.

7.6.5 Continue message and processing

This section describes the implementation of the Continue Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Continue message. See Section 6.6.3 , “Continue message and processing,” on page 279.

7.6.6 Disconnect message and processing

This section describes the implementation of the Disconnect Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Disconnect message. See Section 6.6.7 , “Disconnect message,” on page 285.

7.6.7 Send_To_Resource message and processing

The SCP can respond to Info_Analyzed query message by sending a Send_To_Resource message. See Section 12.1 “STR message / Internal resource” on page 491

7.7 Public_Feature_Code trigger

This section describes the Public_Feature_Code trigger.

7.7.1 Product view

The Public_Feature_Code trigger implements the Public_Feature_Code Trigger FS.

AIN Service Enablers implements the Public_Feature_Code trigger according to GR-1298 and GR-1299. It is equivalent to AIN Essentials’ Public Office Dialing Plan Feature (PODPFeat) trigger.

Note: In AIN Service Enablers, the Public_Feature_Code (PFC) trigger is equivalent to the PODPFeat trigger in AIN Essentials. Since both triggers share the same provisioning, TRAVER and other provisioning tools use the term PODPFeat to refer to the AIN Service Enablers’ PFC trigger.

7.7.2 Option AINDENY

Option AINDENY excludes triggering on individual lines when the PFC trigger is subscribed on the customer group. This line option provides a way of excluding individual lines from triggering for:

- particular trigger item IDs of PFC trigger type
- all group-subscribed trigger items of PFC trigger type

7.8 Office_Public_Feature_Code trigger

This section describes the Office_Public_Feature_Code (OFCPFC) trigger.

7.8.1 Product view

The Office_Public_Feature_Code trigger implements the Office_Public_Feature_Code Trigger FS.

AIN Service Enablers implements the Office_Public_Feature_Code trigger according to GR-1298 and GR-1299 (issue 6).

The OFCPFC trigger is supported for only RES and ISDN BRI agents belonging to a RES group.

7.8.2 Option AINDENY

Option AINDENY excludes triggering on individual lines when the OFCPFC trigger is subscribed on the customer group. This line option provides a way of excluding individual lines from triggering for:

- particular trigger item IDs of OFCPFC trigger type
- all group-subscribed trigger items of OFCPFC trigger type

7.9 Customized_Dialing_Plan trigger

This section describes the Customized_Dialing_Plan (CDP) trigger.

The CDP trigger consists of three feature access code variants:

- intercom or extension number
- access code
- off-board processor Feature Access Code (FAC)

The off-board processor FAC variants consists of the digits that are dialed to invoke a feature defined in the off-board processor. A FAC can be one to six digits, and the first digit can be an asterisk (*) or an octothorpe (#). The trigger is assigned to a customer group with a customized dialing plan. The CDP triggers occur at the Info_Analyzed TDP.

The CDP access code variant consists of an access code that contains the digits that are dialed to gain access to a private or public environment (for example, 9+ to access the public environment). The CDP intercom or extension code variant consists of an extension or intercom number.

7.9.1 Product view

The Customized_Dialing_Plan trigger implements the Customized_Dialing_Plan Trigger FS.

AIN Service Enablers implements the Customized_Dialing_Plan trigger according to GR-1298 and GR-1299.

7.10 Specified_Carrier trigger

This section describes trigger Specified_Carrier.

7.10.1 Product view

Trigger Specified_Carrier implements the Specified_Carrier Trigger FS.

The Specified_Carrier trigger consists of the following functions:

- Trigger precedence
- Specified_Carrier trigger detection and processing

- Info_Analyzed message and processing
- Analyze_Route message and processing
- Continue message and processing
- Disconnect message and processing
- Send_To_Resource message and processing
- Collect_Information message and processing

7.10.2 Trigger precedence

See Section 3.1.2 “Trigger precedence” on page 124.

7.10.3 Specified_Carrier trigger detection and processing

There are three methods for detecting trigger Specified_Carrier. The three methods of detecting trigger Specified_Carrier are as follows:

- the CAC digit string is dialed
- parameter Carrier Selection Information from an ISUP message for an incoming trunk is “Selected carrier identification code pre-subscribed and input by calling party,” or “Selected carrier identification code not pre-subscribed and input by calling party”
- the Transit Network Selector Information Element is present in a NTNA/NI PRI SETUP message. Trigger Specified_Carrier should not be detected on the Carrier Format field of parameter Carrier of an SCP Response message according to GR-1298-ILR, Issues 4A, December 1997, issue id:11-2596, page 3-279

A detailed list of the triggering conditions for trigger Specified_Carrier are as follows:

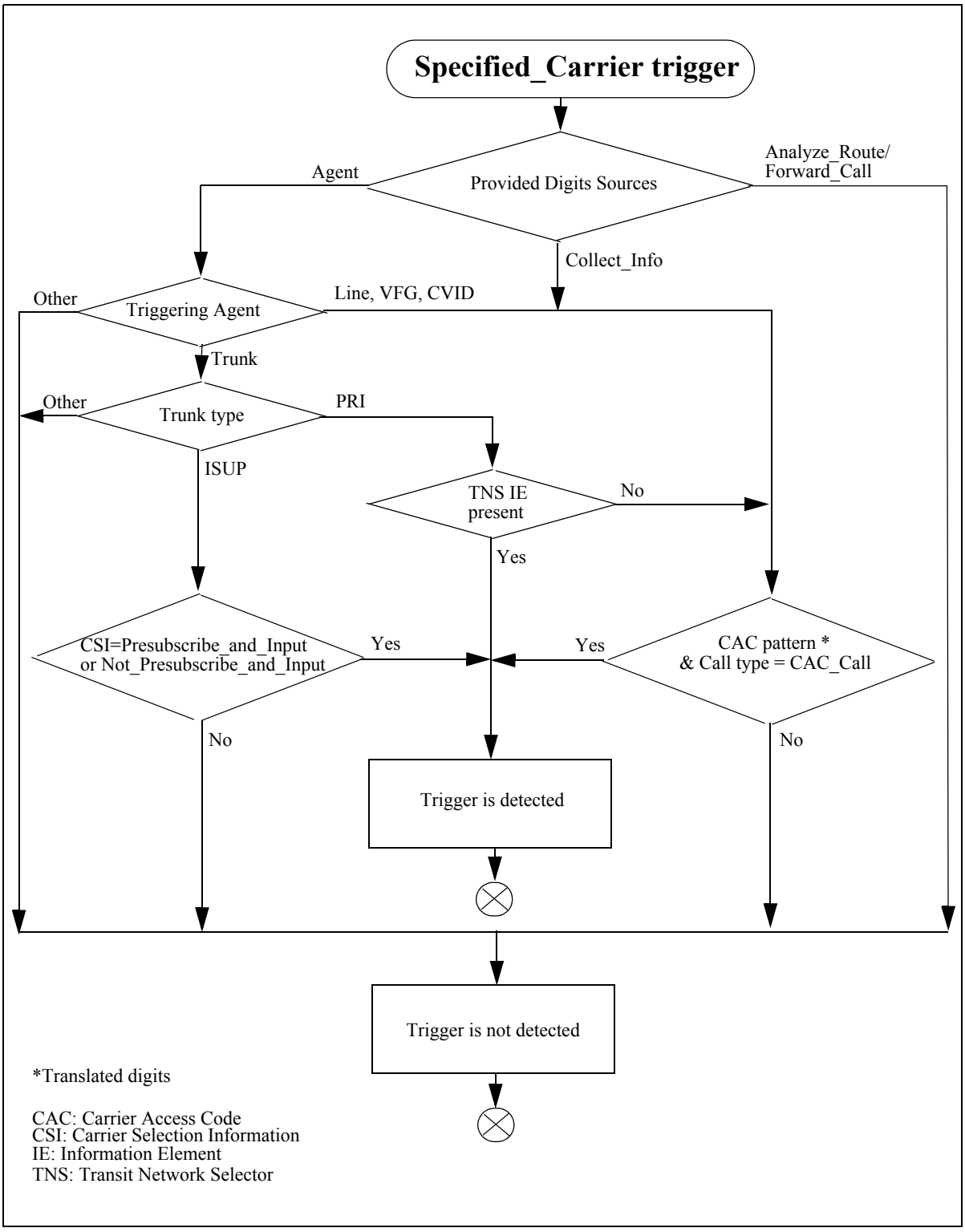
Note: These conditions must all be met at the same time to activate trigger Specified_Carrier.

- trigger Specified_Carrier is activated for triggering on the call (either originator line, trunk, office-wide, or customer group subscription)
- the digit string received by the switch in a call, matches one of these digit patterns
  - 10XXX
  - 10XXX 0-
  - 10XXX 00-
  - 10XXX NXX-XXXX
  - 10XXX 1+NXX-XXXX
  - 10XXX 1+NPA-NXX-XXXX

  - 10XXX 0+NXX-XXXX
  - 10XXX 0+NPA-NXX-XXXX
  - 10XXX 011+
  - 10XXX 01+
  - 101XXXX
  - 101XXXX 0-
  - 101XXXX 00-
  - 101XXXX NXX-XXXX
  - 101XXXX 1+NXX-XXXX
  - 101XXXX 1+NPA-NXX-XXXX
  - 101XXXX 0+NXX-XXXX
  - 101XXXX 0+NPA-NXX-XXXX
  - 101XXXX 011+
  - 101XXXX 01+
- when the Carrier Selection Information parameter of an ISUP message for an incoming trunk is “Selected carrier identification code pre-subscribed and input by calling party” or “Selected carrier identification code not pre-subscribed and input by calling party”
- when the Transit Network Selector is present in a NTNA/NI PRI SETUP message.
- the originating agent is a supported AIN agent

Figure 23 “Trigger Specified_Carrier detection flowchart” illustrates the process for detecting trigger Specified_Carrier.

Figure 23 Trigger Specified_Carrier detection flowchart



7.10.4 Info_Analyzed message and processing

This section describes the implementation of the Info_Analyzed Message and Processing FSS for the Specified_Carrier trigger.

Once the criteria for the Specified_Carrier trigger are validated, the SSP sends the Info_Analyzed message to the SCP or adjunct. See Section 6.4.4.3 “Info_Analyzed trigger request message” on page 204.

7.10.5 Analyze_Route message and processing

This section describes the implementation of the Generic Analyze_Route Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Analyze_Route message. See Section 6.6.1 , “Analyze_Route message,” on page 258.

7.10.6 Continue message and processing

This section describes the implementation of the Continue Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Continue message. See Section 6.6.3 , “Continue message and processing,” on page 279.

7.10.7 Disconnect message and processing

This section describes the implementation of the Disconnect Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Disconnect message. See Section 6.6.7 , “Disconnect message,” on page 285.

7.10.8 Send_To_Resource message and processing

This section describes the implementation of the Send_To_Resource Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Send_To_Resource message. See Section 12.1 “STR message / Internal resource” on page 491

7.10.9 Collect_Information message and processing

This section describes the implementation of the Collect_Information Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Collect_Information message. See Section 6.6.2 “Collect_Information message” on page 267.

7.10.10 Serial triggering

An SCP or adjunct response can lead to other triggers being hit in the same TDP. This is known as serial triggering.

Trigger Specified_Carrier supports serial triggering, however, when an SCP response specifies a non-local carrier, the call processing skips the Info-Analyzed TDP. Call processing cannot serially encounter any of the triggers in the Info_Analyzed TDP. Trigger Specified_Carrier cannot be detected consecutively on a call unless a continue response is received.

Trigger Specified_Carrier cannot be detected from an Analyze_Route or Forward_Call SCP response (as specified in GR-1298-ILR, Issues 4A, December 1997, issue ID:11-2596, page 3 to 279).

7.11 One_Plus_Prefix trigger

This section describes the One_Plus_Prefix trigger.

7.11.1 Product view

The One_Plus_Prefix trigger implements the One_Plus_Prefix Trigger FS.

The One_Plus_Prefix trigger consists of the following functions:

- Trigger precedence
- One_Plus_Prefix trigger detection and processing
- Info_Analyzed message and processing
- Analyze_Route message and processing
- Continue message and processing
- Disconnect message and processing
- Send_To_Resource message and processing
- Collect_Information message and processing

7.11.2 Trigger precedence

See Section 3.1.2 “Trigger precedence” on page 124.

7.11.3 One_Plus_Prefix trigger detection and processing

Trigger One_Plus_Prefix is detected when one of the following conditions is satisfied:

- when the digit string is received by the switch, or
- when the digit string is contained in the Called Party Number in a PRI SETUP message, or

Note: The digit string must conform with the North American Numbering Plan (NANP) and must be preceded by a "1+", "10XXX 1+", or "101XXXX 1+".

- when parameter Prefix (in an SCP Response message) is 'OnePlus' and the current trigger is not LNP, or the previous trigger was not One_Plus

A detailed list of the triggering conditions for trigger One_Plus_Prefix are as follows:

Note: For triggering to occur, all the following conditions must be met at the same time.

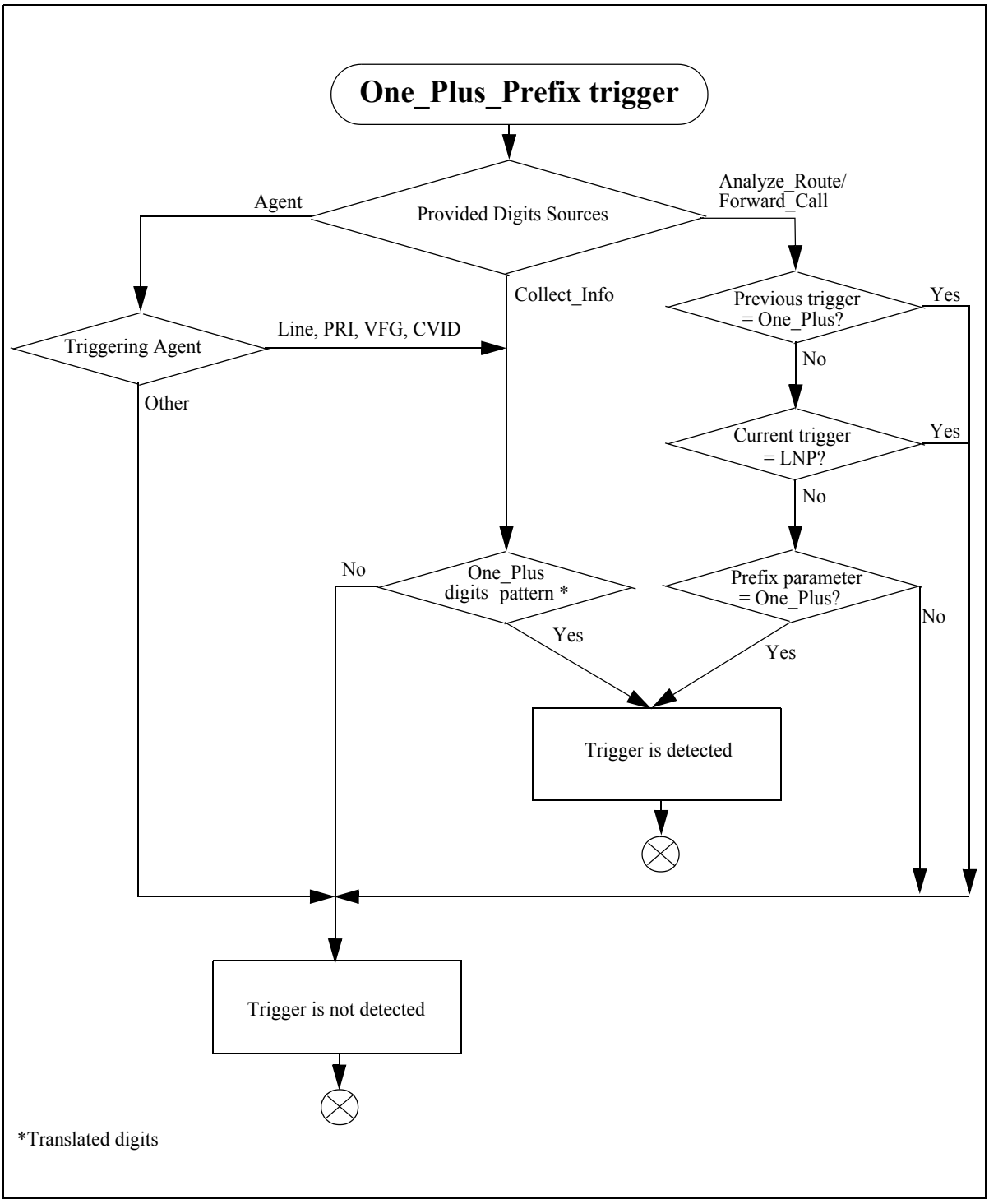
- trigger One_Plus_Prefix is activated for triggering on the call (either originator line, trunk, office-wide, or customer group subscription)
- the switch receives a digit string in a call that matches one of the following digit patterns
  - 1+NXX-XXXX
  - 1+NPA-NXX-XXXX
  - 10XXX 1+NXX-XXXX
  - 10XXX 1+NPA-NXX-XXXX
  - 101XXXX 1+NXX-XXXX
  - 101XXXX 1+NPA-NXX-XXXX
  - or parameter *Prefix* in an SCP Response message is "OnePlus"

    Note: AIN TFS and 900/700 service access codes automatically escape trigger One_Plus_Prefix.

- the originating agent is a supported AIN agent

Figure 24 illustrates the process for detecting trigger One_Plus_Prefix.

Figure 24 Trigger One_Plus_Prefix detection flowchart



7.11.4 Info_Analyzed message and processing

This section describes the implementation of the Info_Analyzed Message and Processing FSS for the One_Plus_Prefix trigger.

Once the criteria for the One_Plus_Prefix trigger are validated, the SSP sends the Info_Analyzed message to the SCP or adjunct. See Section 6.4.4.3 “Info_Analyzed trigger request message” on page 204.

7.11.5 Analyze_Route message and processing

This section describes the implementation of the Generic Analyze_Route Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Analyze_Route message. See Section 6.6.1 “Analyze_Route message” on page 258.

7.11.6 Continue message and processing

This section describes the implementation of the Continue Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Continue message. See Section 6.6.3 “Continue message and processing” on page 279.

7.11.7 Disconnect message and processing

This section describes the implementation of the Disconnect Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Disconnect message. See Section 6.6.7 “Disconnect message” on page 285.

7.11.8 Send_To_Resource message and processing

This section describes the implementation of the Send_To_Resource Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Send_To_Resource message. See Section 12.1 “STR message / Internal resource” on page 491.

7.11.9 Collect_Information message and processing

This section describes the implementation of the Collect_Information Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Collect_Information message. See Section 6.6.2 “Collect_Information message” on page 267.

7.11.10 Serial triggering

See Section 7.10.10 “Serial triggering” on page 351.

Serial triggering is supported by trigger One_Plus_Prefix, however, a triggering limit is enforced. Trigger One_Plus_Prefix cannot be detected consecutively on a call unless a continue response is received. When the last trigger detected is trigger One_Plus_Prefix, the same trigger cannot be detected as a result of an SCP response.

7.12 International trigger

This section describes trigger International.

7.12.1 Product view

Trigger International implements trigger International FS.

Trigger International consists of the following functions:

- Trigger precedence
- International trigger detection and processing
- Info_Analyzed message and processing
- Analyze_Route message and processing
- Continue message and processing
- Disconnect message and processing
- Send_To_Resource message and processing
- Collect_Information message and processing

7.12.2 Trigger precedence

See Section 3.1.2 “Trigger precedence” on page 124.

7.12.3 International trigger detection and processing

Trigger International is detected when one of the following conditions is satisfied:

- a digit string is dialed that matches the criteria for an international call
- the *Nature of Number* field of an SCP Response message is “international number” or “international, operator requested”
- the *Nature of Address* field of the *Called Party Number* parameter of an ISUP message for an incoming trunk is “international number” or “international, operator requested”
- the *Type of Number and numbering plan* field in a *Called Party Number* Information Element of a PRI SETUP message is “International number in ISDN numbering plan”

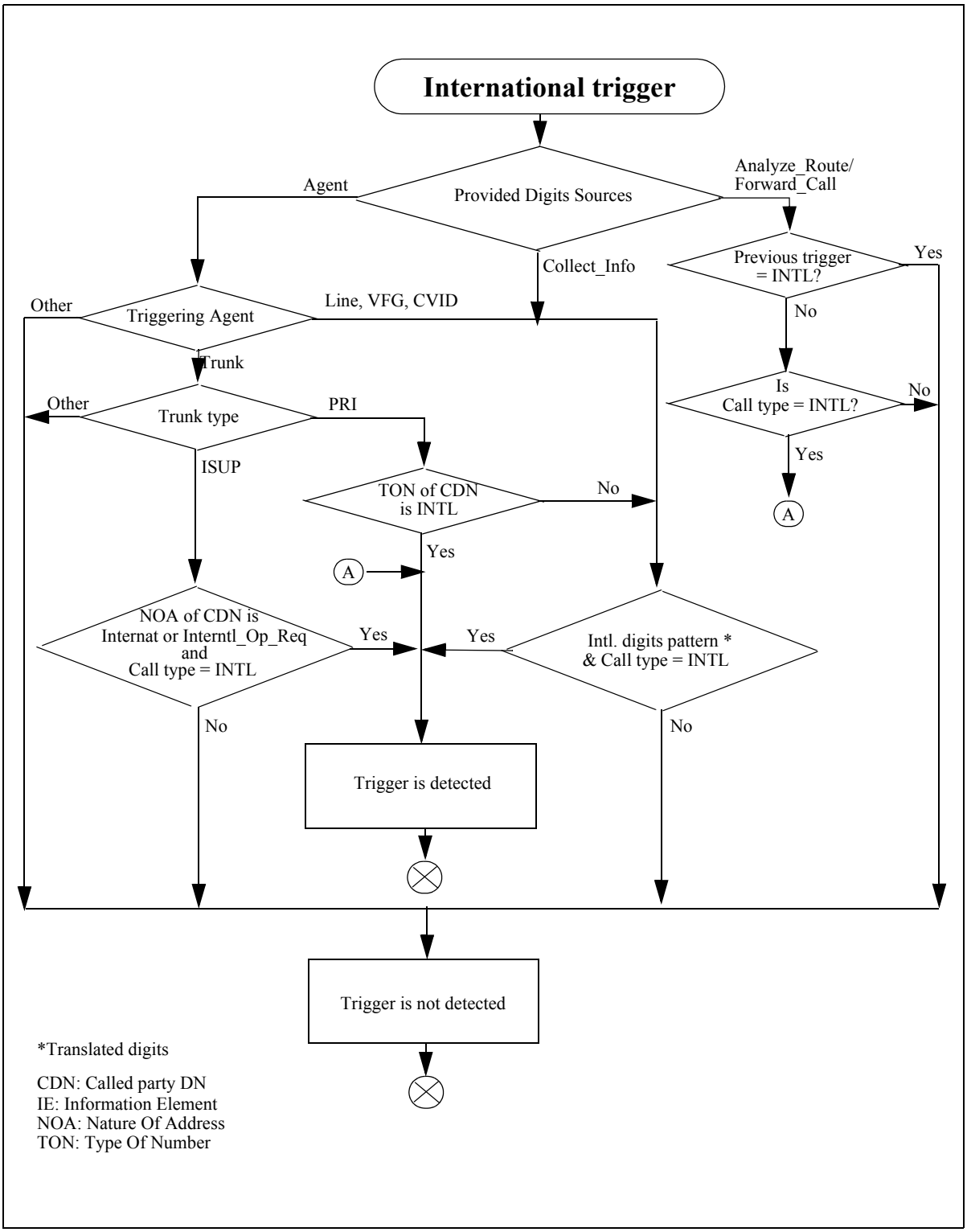
A detailed list of the triggering conditions for trigger International are as follows:

Note: For triggering to occur, all the following conditions must be met at the same time.

- trigger International is activated for triggering on the call (either originator line, trunk, office-wide, or customer group subscription)
- the switch receives a digit string in a call that matches one of the following digit patterns
  - 011+ 7 to 15 digits
  - 01+ 7 to 15 digits
  - 10XXX 011+ 7 to 15 digits
  - 10XXX 01+ 7 to 15 digits
  - 101XXXX 011+ 7 to 15 digits
  - 101XXXX 01+ 7 to 15 digits
  - when the *Nature of Address* field of parameter *Called Party Number* in an ISUP message for an incoming trunk is "international number" or "international, operator requested"
  - when the *Nature of Number* field of parameter *CalledPartyID* in an SCP Response message is "international number" or "international, operator requested"
  - when the *Type of Number and numbering plan* field in a *Called Party Number* information element of a PRI SETUP message is "International number in ISDN numbering plan"
- the originating agent is a supported AIN agent

Figure 25 on page 357 illustrates the process for detecting trigger International.

Figure 25 Trigger International detection flowchart



7.12.4 Info_Analyzed message and processing

This section describes the implementation of the Info_Analyzed Message and Processing FSS for the International trigger.

Once the criteria for the International trigger are validated, the SSP sends the Info_Analyzed message to the SCP or adjunct. See Section 6.4.4.3 “Info_Analyzed trigger request message” on page 204.

7.12.5 Analyze_Route message and processing

This section describes the implementation of the Generic Analyze_Route Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Analyze_Route message. See Section 6.6.1 “Analyze_Route message” on page 258.

7.12.6 Continue message and processing

This section describes the implementation of the Continue Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Continue message. See Section 6.6.3 “Continue message and processing” on page 279.

7.12.7 Disconnect message and processing

This section describes the implementation of the Disconnect Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Disconnect message. See Section 6.6.7 “Disconnect message” on page 285.

7.12.8 Send_To_Resource message and processing

This section describes the implementation of the Send_To_Resource Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Send_To_Resource message. See Section 12.1 “STR message / Internal resource” on page 491.

7.12.9 Collect_Information message and processing

This section describes the implementation of the Disconnect Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Collect_Information message. See Section 6.6.2 “Collect_Information message” on page 267.

7.12.10 Serial triggering

See Section 7.10.10 “Serial triggering” on page 351.

Serial triggering is supported by trigger International, however, a triggering limit is enforced. Trigger International cannot be detected consecutively on a call unless a continue response is received. When the last trigger detected is trigger International, the same trigger cannot be detected as a result of an SCP response.

7.13 Operator_Services trigger

This section describes the Operator_Services trigger.

7.13.1 Product view

The Operator_Services trigger implements the Operator_Services Trigger FS.

The Operator_Services trigger consists of the following functions:

- Trigger precedence
- Operator_Services trigger detection and processing
- Info_Analyzed message and processing
- Analyze_Route message and processing
- Continue message and processing
- Disconnect message and processing
- Send_To_Resource message and processing
- Collect_Information message and processing

7.13.2 Trigger precedence

See Section 3.1.2 “Trigger precedence” on page 124.

7.13.3 Operator_Services trigger detection and processing

Trigger Operator_Services is detected when one of the following conditions is satisfied:

- a digit string is dialed that matches the criteria for a call that requests operator services functions
- when the *Nature of Number* field of an SCP Response message, or the *Nature of Address* field of parameter *Called Party Number* of an ISUP message for an incoming trunk is “subscriber, operator requested,” or “national, operator requested,” “no address present, operator requested,” or “international, operator requested”

- when an *Operator System Access* information element is present in a PRI SETUP message
- when the dialed digits present in the mandatory *Called Party Number* information element of a Nortel North American (NTNA) PRI SETUP message matches the criteria for a call requesting operator services functions

A detailed list of the triggering conditions for trigger Operator_Services are as follows:

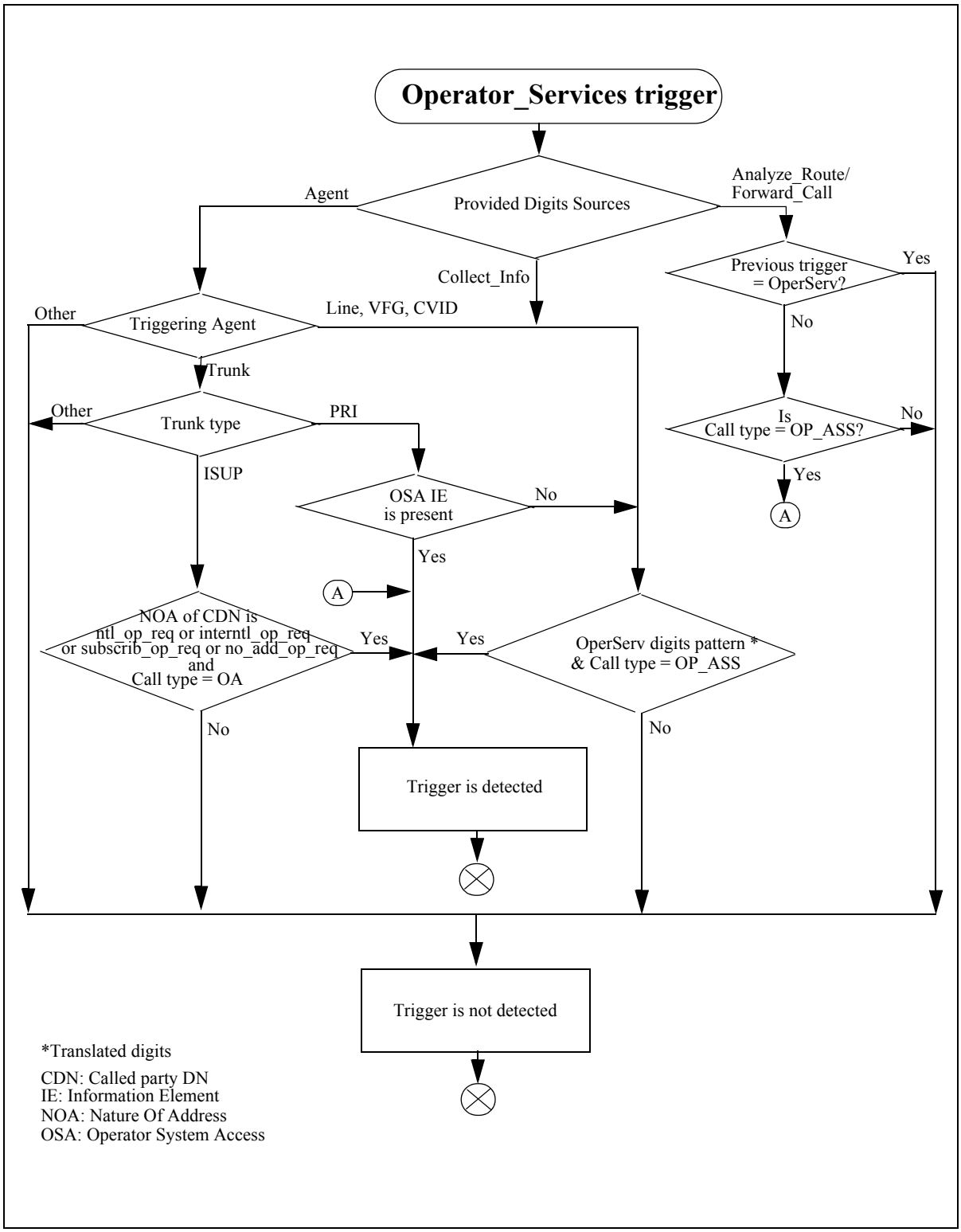
Note: For triggering to occur, all the following conditions must be met at the same time.

- trigger Operator_Services is activated for triggering on the call (either originator line, trunk, office-wide, or customer group subscription)
- the switch receives a digit string in a call that matches one of the following digit patterns
  - 0-
  - 00-
  - 10XXX 0-
  - 10XXX 00-
  - 101XXXX 0-
  - 101XXXX 00-
  - 0+
  - 01+
  - 10XXX 0+
  - 10XXX 01+
  - 101XXXX 0+
  - 101XXXX 01+
  - when the *Nature of Address* field of parameter *Called Party Number* in an ISUP message for an incoming trunk is “subscriber, operator requested,” or “national, operator requested,” “no address present, operator requested,” or “international, operator requested”
  - when the *Nature of Number* field of parameter *CalledPartyID* in an SCP Response message is “subscriber, operator requested”, “national, operator requested”, “no address present, operator requested” or “international, operator requested”

  - — when an *Operator System Access* Information Element is present in a PRI SETUP message
  - — the dialed digits present in the mandatory *Called Party Number* Information Element of a NTNA PRI SETUP message, matches the criteria for a call requesting operator services functions
- the originating agent is a supported AIN agent

Figure 26 on page 362 illustrates the process for detecting trigger Operator_Services.

Figure 26 Trigger Operator_Services detection flowchart



7.13.4 Info_Analyzed message and processing

This section describes the implementation of the Info_Analyzed Message and Processing FSS for the Operator_Services trigger.

Once the criteria for the Operator_Services trigger are validated, the SSP sends the Info_Analyzed message to the SCP or adjunct. See Section 6.4.4.3 “Info_Analyzed trigger request message” on page 204.

7.13.5 Analyze_Route message and processing

This section describes the implementation of the Generic Analyze_Route Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Analyze_Route message. See Section 6.6.1 “Analyze_Route message” on page 258.

7.13.6 Continue message and processing

This section describes the implementation of the Continue Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Continue message. See Section 6.6.3 “Continue message and processing” on page 279.

7.13.7 Disconnect message and processing

This section describes the implementation of the Disconnect Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Disconnect message. See Section 6.6.7 “Disconnect message” on page 285.

7.13.8 Send_To_Resource message and processing

This section describes the implementation of the Send_To_Resource Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Send_To_Resource message. See Section 12.1 “STR message / Internal resource” on page 491.

7.13.9 Collect_Information message and processing

This section describes the implementation of the Collect_Information Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Collect_Information message. See Section 6.6.2 “Collect_Information message” on page 267.

7.13.10 Serial triggering

See Section 7.10.10 “Serial triggering” on page 351.

Serial triggering is supported by trigger Operator_Services, however, a triggering limit is enforced. Trigger Operator_Services cannot be detected consecutively on a call unless a continue response is received. When the last trigger detected is trigger Operator_Services, the same trigger cannot be detected as a result of an SCP response.

7.14 Specific_Digit_String trigger

This section describes the Specific_Digit_String (SDS) trigger.

The SDS trigger is a 3-to-10 digits Public Office Dialing Plan (PODP) trigger that occurs at the Analyze_Information TDP. It is only applicable to agents subscribing to the public office dialing plan.

7.14.1 Product view

The Specific_Digit_String trigger implements the Specific_Digit_String Trigger FS.

AIN Service Enablers implements the Specific_Digit_String trigger according to GR-1298 and GR-1299. It is equivalent to AIN Essentials’ Public Office Dialing Plan (PODP) trigger.

Note: In AIN Service Enablers, the Specific_Digit_String (SDS) trigger is equivalent to the PODP trigger in AIN Essentials. TRAVER and other provisioning tools can use the term PODP to refer to the AIN Service Enablers’ SDS trigger.

7.15 N11 trigger

This section describes the N11 trigger.

7.15.1 Product view

AIN Service Enablers implements the N11 trigger according to GR-1298 and GR-1299.

The N11 trigger implements the N11 Trigger FS.

7.16 Automatic_Flexible_Routing trigger

This section describes the Automatic_Flexible_Routing trigger.

7.16.1 Product view

The Automatic_Flexible_Routing trigger implements the Automatic_Flexible_Routing Trigger FS.

AIN Service Enablers implements the Automatic_Flexible_Routing trigger according to GR-1298 and GR-1299.

7.17 O_Called_Party_Busy trigger

This section describes the O_Called_Party_Busy (O_CPB) trigger, that provides the ability to control routing for an AIN busy cause.

The O_Called_Party_Busy trigger can be subscribed to lines or trunks, but not to an entire office.

7.17.1 Product view

The O_Called_Party_Busy trigger implements the O_Called_Party_Busy Trigger FS.

The O_Called_Party_Busy trigger event consists of the following functions:

- O_Called_Party_Busy trigger detection and processing
- O_Called_Party_Busy trigger request message and processing
- Analyze_Route message and processing
- Continue message and processing
- Send_To_Resource message and processing

7.17.2 O_Called_Party_Busy trigger detection and processing

This section describes the implementation of the O_CPB Trigger Detection and Processing FSS.

The O_Called_Party_Busy trigger is detected when the SSP detects that the called line is busy or that the call has been rejected. For interoffice calls, it can only be detected when the call is offered to local terminators served by ISUP or PRI trunks.

The O_Called_Party_Busy event has precedence over the O_Called_Party_Busy trigger.

In addition to a busy condition, the SSP detects the O_Called_Party_Busy trigger when the call encounters one of the following types of features:

- call waiting (CWT), when two calls are currently active
- cancel CWT, with one active call
- additional call offering unrestricted (ACOU) with all lines active
- anonymous call rejection (ACRJ)
- a hunt group with all group members busy

- multiple appearance directory number (MADN) when all members are busy
- denied termination (DTM)
- suspend (SUS) or request suspend (RSUS)
- denied incoming (DIN)
- make set busy (MSB)

Maintenance situations are not valid busy causes. The preceding list of call features is not exhaustive. See Chapter 22: "AIN/DMS-100 interactions (A and B)" on page 741 through Chapter 2: "AIN/DMS-100 interactions (S to Z)" on page 175

The SSP can detect trigger O_Called_Party_Busy when the call encounters other call features. See Chapter 22: "AIN/DMS-100 interactions (A and B)" on page 741 through Chapter 2: "AIN/DMS-100 interactions (S to Z)" on page 175 for a complete list.

For interswitch calls, using ISUP or PRI trunks, the O_Called_Party_Busy trigger is detected when the release message busy cause is sent by the terminating switch to the originating switch.

The busy tone needs to be applied locally, rather than by the far-end switch, to be detected. When the busy tone is applied through the speech path, the O_Called_Party_Busy trigger is not detected. See Section 20.20 "Event limitations and restrictions" on page 692 for a description of how to datafill the TMTMAP table.

Table 124 maps DMS treatments to the AIN BusyCause parameter and specifies the DMS treatments that activate the O_Called_Party_Busy trigger. In Table 124, the DMS treatment occur when a public network is serving the remote user.

Table 124 DMS treatments and AIN BusyCause parameter

DMS treatment			AIN BusyCause parameter
Name	**Identifier**	**Identifier number**	**Cause value**
Busy line	BUSY	19	User busy
DSCWID disconnect	DSCN	176	
Trouble intercept	TRBL	30	Destination out of order

Table 124 DMS treatments and AIN BusyCause parameter (Continued)

DMS treatment			AIN BusyCause parameter
Name	**Identifier**	**Identifier number**	**Cause value**
Denied termination	DNTR	33	Call rejected
ACRJ call reject	ACRJ	166	
Call rejected	CREJ	134	
Call not allowed	CNAD	137	
SCA call reject	SCA	157	
Coin denied termination	CNDT	5	
SCRJ call reject	SCRJ	150	
Terminating suspended service	TESS	28	
Blank directory number (AIN TAT)	BLDN	18	No route to destination

See NTP 297-8001-350, North American DMS-100 Translation Guide, Volume 21 of 22, Data Schema Part 8 of 9, LEC0007 and up, Standard 06.01, March 1997, for more detail on DMS treatments and to GR-1298 for more information on parameter BusyCause.

7.17.2.1 O_Called_Party_Busy feature deactivation

Trigger O_Called_Party_Busy is deactivated when TWC flashes while awaiting ISUP REL message.

7.17.3 O_Called_Party_Busy trigger request message and processing

This section describes the implementation of the O_Called_Party_Busy Request Message and Processing FSS.

When trigger O_Called_Party_Busy is detected, the trigger O_Called_Party_Busy request message is sent to the SCP. The SSP does not provide a busy indication to the calling party at this point.

See Table 44 on page 207 for a description of the O_Called_Party_Busy trigger request message parameters.

When the SSP receives the SCP response, it decodes the response and processes the call according to the instructions contained in the response.

Valid SCP response messages include

- Analyze_Route
- Continue, after an Info_Analyzed query only
- Send_To_Resource

7.17.4 Analyze_Route message and processing

This section describes the implementation of the Generic Analyze_Route Message and Processing FSS and the Specific Analyze_Route Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Analyze_Route message. See Section 6.6.1 “Analyze_Route message” on page 258.

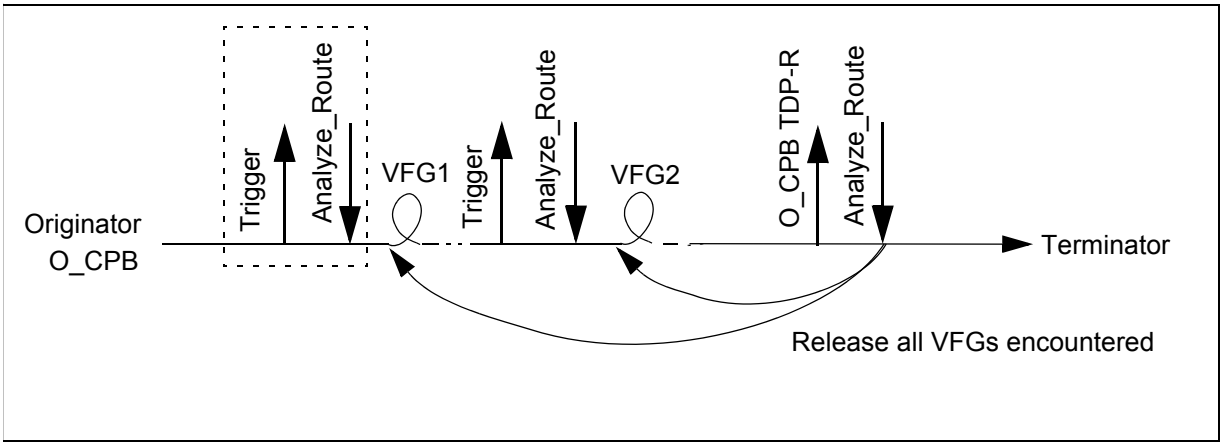
The processing of the Analyze_Route response message for the O_Called_Party_Busy trigger also does the following when a VFG is encountered in same call leg as the TDP-request:

- Any member of a VFG that was allocated in the call leg is released from the call (reducing the number of active calls using the VFG).
- The originating characteristics of the agent that encountered the first VFG in the call leg are restored so they can be used in subsequent response translations and query parameter population.
- Any AIN call data (for example, response parameters) updated by subsequent AIN triggering in the VFG call leg shall be discarded and replaced with AIN call data that was in effect prior to the released VFG.
- Any individual or customer group based triggers that were active when the first VFG was encountered in the call leg can still be detected.
- The special billing number of any VFG that is released is not used in subsequent billing.
- Any AMA records generated as a result of throttling through the VFG are marked as unanswered, even though the call can be answered in a subsequent leg, and are appended with module code 204. SMDR records generated by the VFG leg are marked as answered.

Figure 27 illustrates these functions. It shows that several VFGs can be encountered within a call leg before encountering an O_Called_Party_Busy TDP-request. While processing the Analyze_Route response to the O_Called_Party_Busy TDP-request, all the VFGs in the call leg are released. The originating characteristics of the triggering agent (in this scenario, the originator) are used in the response translation of the Analyze_Route message. Any AIN response data updated due to a post-VFG trigger is discarded. The originating characteristics of the triggering agent (in this scenario, the

originator) are those characteristics that were used in the call before the first VFG in the call leg was encountered.

Figure 27 Releasing all VFGs in a call leg for trigger O_Called_Party_Busy



7.17.4.1 Interactions with redirection

Any VFG encountered in an earlier call leg always remains on the call. This applies to any redirection that cause a new call leg to be created including:

- AIN-based redirection, such as that caused by a Forward_Call response
- switch-based features, such as Call forward (CFW)

7.17.5 Continue message and processing

This section describes the implementation of the Continue Message and Processing FSS.

The SCP can respond to Info_Analyzed query message by sending a Continue message. See Section 6.6.3 “Continue message and processing” on page 279.

7.17.6 Send_To_Resource message and processing

See Section 12.1 “STR message / Internal resource” on page 491.

Any VFG encountered in the call leg is released when processing a Send_to_Resource message. Refer to Section 7.17.4 on page 368 for further details on releasing the VFG.

7.17.7 Sample call scenarios

This section describes sample intraswitch call scenarios for trigger O_Called_Party_Busy.

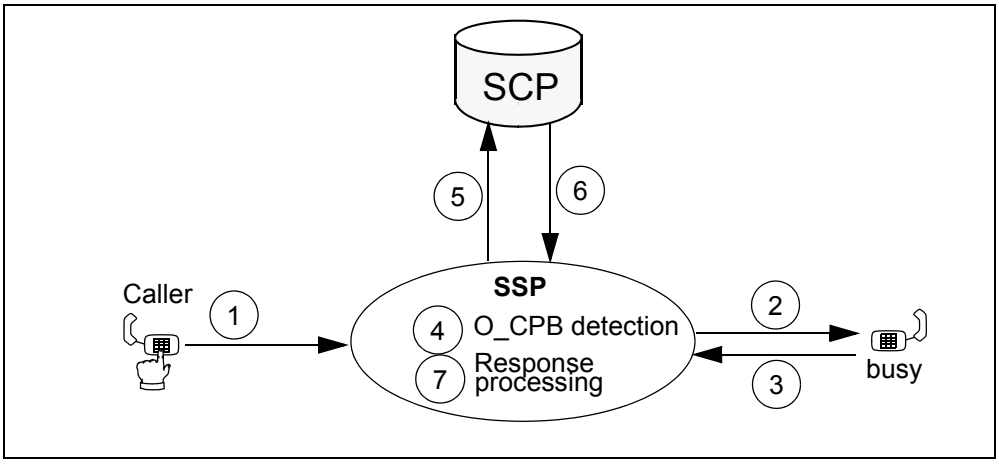
7.17.7.1 O_Called_Party_Busy basic call

Figure 28 describes the basic call scenario where an originating agent (a calling party) attempts to call a terminating agent (a called party) that is busy

at that moment and subscribed to the trigger. During the attempt, the O_Called_Party_Busy trigger is detected and processed.

1. The calling party dials the called party DN.
2. The attempt to establish a connection fails. An indication that the called party is busy is sent to the SSP.
3. The SSP attempts to establish a connection with the called party.
4. The called party busy criteria is met. The O_Called_Party_Busy trigger is detected. The calling party does not yet hear busy indication.
5. The O_Called_Party_Busy trigger request message is sent to the SCP. The SSP does not provide the busy indication to the calling party. (It waits for instructions from the SCP response.)
6. The SCP sends an O_Called_Party_Busy response message to the SSP with the instructions to continue call processing.
7. The O_Called_Party_Busy response is decoded and call processing is resumed according to the instructions contained in the response (Analyze_Route, Continue or Send_to_Resource).

Figure 28 O_Called_Party_Busy basic call



7.17.7.2 O_Called_Party_Busy terminating agent goes on-hook

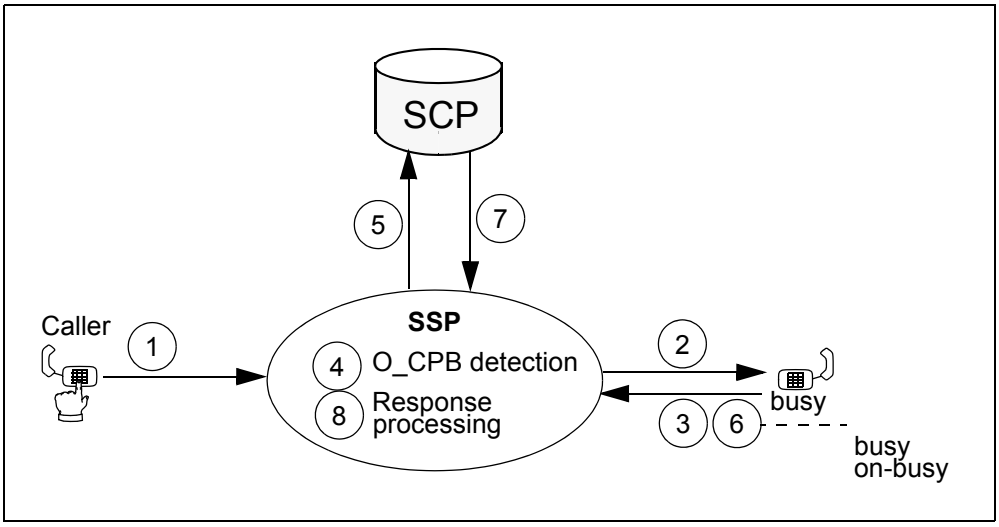
Figure 29 describes a call scenario where an originating agent (a calling party) attempts to call a terminating agent (a called party) that is busy at that moment and subscribed to the trigger. During the attempt, the O_Called_Party_Busy trigger is detected and the SSP sends an O_Called_Party_Busy trigger request message to the SCP. Before the SCP response is received the terminating agent, who was off-hook when the call began, goes on-hook.

1. The calling party dials the called party DN.
2. The SSP attempts to establish a connection with the called party.

3. The attempt to establish a connection fails. An indication that the called party is busy is sent to the SSP.
4. The called party busy criteria is met. The O_Called_Party_Busy trigger is detected. The calling party does not yet hear busy indication.
5. The O_Called_Party_Busy trigger request message is sent to the SCP. The SSP does not provide the busy indication to the calling party. (It waits for instructions from the SCP response.)
6. The called party goes on-hook (hangs up).
7. The SCP sends a response to the SSP with instructions to continue call processing.
8. The SCP response is decoded and call processing continues according to the instructions it contains (Analyze_Route, Continue or Send_to_Resource).

   When the O_Called_Party_Busy trigger is detected and trigger processing is started, processing is not altered by the called party going on-hook.

Figure 29 O_Called_Party_Busy terminating agents goes on-hook



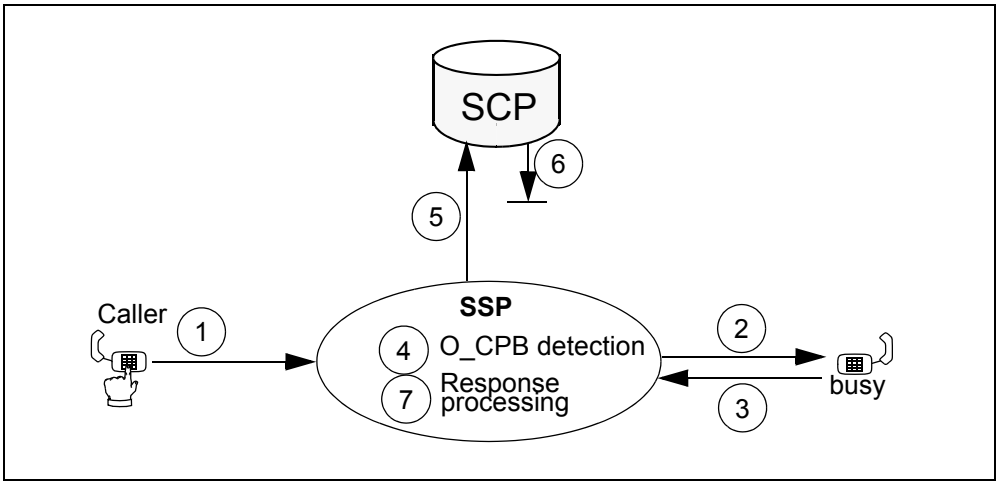
7.17.7.3 O_Called_Party_Busy SCP response error

Figure 30 describes a call scenario where an originating agent (a calling party) attempts to call a terminating agent (a called party) that is busy at that moment and subscribed to the trigger. During the attempt, the O_Called_Party_Busy trigger is detected and the SSP sends an O_Called_Party_Busy trigger request message to the SCP. Technical difficulties prevent the SSP from getting a valid response message.

1. The calling party dials the called party DN.
2. The SSP attempts to establish a connection with the called party.

3. The called party busy criteria is met. The O_Called_Party_Busy trigger is detected. The calling party does not yet hear busy indication.
4. The attempt to establish a connection fails. An indication that the called party is busy is sent to the SSP.
5. The O_Called_Party_Busy trigger request message is sent to the SCP. The SSP does not provide the busy indication to the calling party. (It waits for instructions from the SCP response.)
6. The SCP sends an O_Called_Party_Busy response message to the SSP with the instructions to continue call processing. However, due to technical difficulties, the SSP does not receive the SCP response, or the response contains an error.
7. Treatment is applied as though the O_Called_Party_Busy trigger had not been detected. This occurs when the AIN T1 response timer expires or when the SCP response contains errors. In this scenario, busy tone is applied to the calling party. All O_Called_Party_Busy resources are cleared.

Figure 30 O_Called_Party_Busy SCP response error



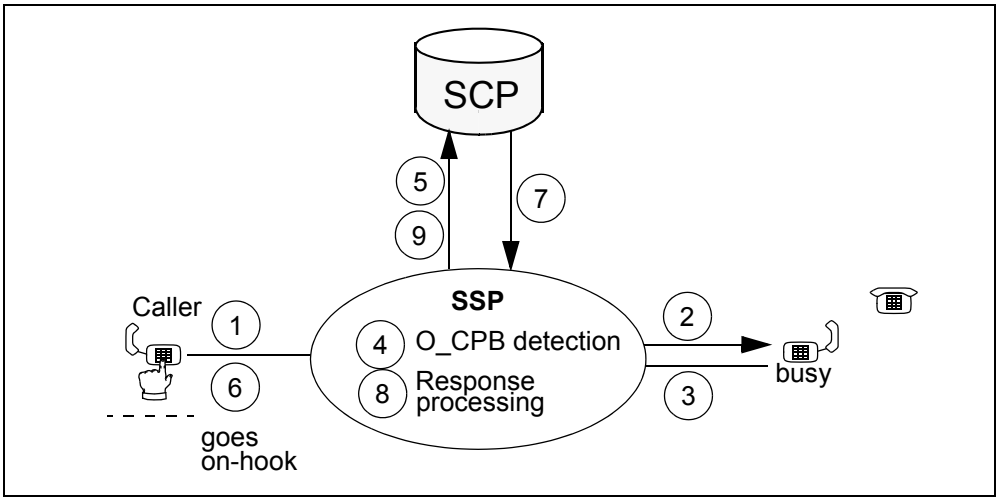
7.17.7.4 O_Called_Party_Busy originating agent goes on-hook

Figure 31 o describes a call scenario where an originating agent (a calling party) attempts to call a terminating agent (a called party) that is busy at that moment and subscribed to the trigger. During the attempt, the O_Called_Party_Busy trigger is detected and the SSP sends an O_Called_Party_Busy trigger request message to the SCP. Before the O_Called_Party_Busy response is received, the originating agent goes on-hook.

1. The calling party dials the called party DN.
2. The attempt to establish a connection fails. An indication that the called party is busy is sent to the SSP.

3. The SSP attempts to establish a connection with the called party.
4. The called party busy criteria is met. The O_Called_Party_Busy trigger is detected. The calling party does not yet hear busy indication.
5. The O_Called_Party_Busy trigger request message is sent to the SCP. The SSP does not provide the busy indication to the calling party. (It waits for instructions from the SCP response.)
6. The calling party hangs up. All resources used by O_Called_Party_Busy processing are cleared. (All O_Called_Party_Busy resources are always cleared when the originating party goes on-hook.)
7. The SCP sends an O_Called_Party_Busy response to the SSP with the instructions to continue call processing.
8. The SSP receives the O_Called_Party_Busy response and discards it since the trigger processing waiting for this response has been canceled.

Figure 31 O_Called_Party_Busy originating agents goes on-hook



7.17.8 Limitations

See Section 20.21.2 “O_Called_Party_Busy and O_No_Answer” on page 695 for limitations associated with the O_Called_Party_Busy trigger.

7.18 O_No_Answer trigger

This section describes trigger O_No_Answer, that can be used to provide services where the user needs alternatives during originating no answer call conditions.

Trigger O_No_Answer can be subscribed to lines or trunks, but not to an entire office.

7.18.1 Product view

The O_No_Answer trigger implements the O_No_Answer Trigger FS.

The O_No_Answer trigger consists of the following functions:

- O_No_Answer trigger request message and processing
- O_No_Answer trigger detection and processing
- Continue message and processing
- Analyze_Route message and processing

7.18.2 O_No_Answer trigger detection and processing

This section describes the implementation of the O_No_Answer Trigger Detection FSS.

The SSP detects the O_No_Answer trigger when the T-O_No_Answer trigger timer expires. The O_No_Answer trigger can only be detected when the call is offered to local terminators served by ISUP trunks, by PRI trunks, or by supported PTS trunks as listed in Table 15 on page 142.

The T-O_No_Answer trigger timer is defined by parameter AIN_O_NO_ANSWER_TRIGGER_TIMER in table OFCENG. Its range of values is 1 to 120. Its default value is 18. The T-O_No_Answer trigger timer can be set by the SCP through the Update message. See Chapter 10: "Information revision messages" on page 313.

The T-O_No_Answer trigger timer applies to an entire office. It is used by each line and trunk which is subscribed to the O_No_Answer trigger. When needed, a timer is started for each O_No_Answer trigger subscriber when the SSP detects called-party ringing:

- For an intraswitch call, the timer is activated immediately when the line to line connection is established, indicating the called party is ringing.
- For an interswitch call going through ISUP trunks, the timer is started when the originating switch receives an Address Complete Message (ACM) indicating that the called party is ringing. For interoffice calls going through PRI or PTS trunks, the timer is started when the trunk has been allocated.

7.18.2.1 T-O_No_Answer trigger timer cancelled

During call processing, the T-O_No_Answer trigger timer might be interrupted for the following reasons:

- For intraswitch calls, the called party answers or the calling party hangs up before the timer expires. In both cases, the SSP detects the condition immediately. No messaging is involved.
- For interswitch calls going through ISUP trunks
  - The called party answers before the timer expires. The SSP detects the condition in the answer message sent by the terminating switch to the originating switch.
  - The SSP receives an ISUP ACM message that indicates either user-network interaction or MF interworking
  - The calling party hangs up before the timer expires. The SSP detects the condition immediately. No messaging is involved.
- For interswitch calls going through PRI trunks
  - The called party answers before the timer expires. The SSP detects the condition in the connecting message sent by the terminating switch to the originating switch.
  - The called party is busy. The SSP detects the condition in the release message sent by the terminating switch to the originating switch. This behavior is specific to PRI trunks and does not apply to ISUP trunks. When calls are routed through PRI trunks, the timer is started immediately after the PRI trunk is allocated on the originating switch. The timer must start at this point because it is not possible to determine when the called party is ringing or not. Sending the progress message to indicate the called party is ringing is optional for PRI trunks.
  - The calling party hangs up before the timer expires. The SSP detects the condition immediately. No messaging is involved.
- For interswitch calls going through a supported PTS trunk as listed in Table 15 on page 142
  - The called party answers before the timer expires. The SSP detects the answer indication sent by the terminating switch to the originating switch.
  - The called party is busy. The SSP detects the disconnect indication sent by the terminating switch to the originating switch.
  - The calling party hangs up before the timer expires. The SSP detects the condition immediately.

Note: When a call is routed through a network through PTS trunks, the O_No_Answer trigger relies on notification from the far-end switch to correctly process the call. Callers can experience undesirable call behavior

when the far-end switch fails to correctly notify the O_No_Answer trigger of the status of the call. For example, when the call interacts with the far-end switch to get an announcement in which the answer indication is not sent over a PTS trunk, the call can be suddenly redirected during the announcement once the T-O_No_Answer trigger timer expires.

7.18.3 Product view

The O_No_Answer trigger implements the O_No_Answer Trigger FS.

The O_No_Answer trigger consists of the following functions:

- O_No_Answer trigger request message and processing
- O_No_Answer trigger detection and processing
- Continue message and processing
- Analyze_Route message and processing

7.18.4 O_No_Answer trigger request message and processing

This section describes the implementation of the O_No_Answer Message and Processing FSS.

When the O_No_Answer trigger is detected, an O_No_Answer trigger request message is sent to the SCP. Detecting the O_No_Answer trigger does not interrupt the station ringing to the calling and the called party that is already in progress.

See Table 47 on page 210 for a description of the O_No_Answer trigger request message parameters.

The SSP receives the SCP response, decodes it, and processes the call according to the instructions it contains.

Valid SCP response messages include

- Analyze_Route
- Continue
- Send_To_Resource

7.18.5 Analyze_Route message and processing

This section describes the implementation of the Generic Analyze_Route Message and Processing FSS and the Specific Analyze_Route Message and Processing FSS.

The processing of the Analyze_Route response message for the O_No_Answer trigger also does supplemental processing when a VFG is encountered in same call leg as the TDP-request. This supplemental

processing is equivalent to that done for the O_Called_Party_Busy trigger. See Section 7.17.3 “O_Called_Party_Busy trigger request message and processing” on page 367 for a complete description.

See Section 6.6.1 “Analyze_Route message” on page 258.

7.18.6 Continue message and processing

This section describes the implementation of the O_No_Answer Continue Message and Processing FSS.

See Section 6.6.3 “Continue message and processing” on page 279.

7.18.7 Send_To_Resource message and processing

See Section 12.1 “STR message / Internal resource” on page 491.

Once a Send_To_Resource is received, the following messages are no longer allowed: Continue, O_No_Answer, Send_To_Resource and Resource_Clear.

Any VFG encountered in the call leg is released when a Send_to_Resource message. Refer to Section 7.17.4 on page 368 for further details on releasing the VFG.

7.18.8 Sample call scenarios

This section describes sample intraswitch call scenarios for the O_No_Answer trigger.

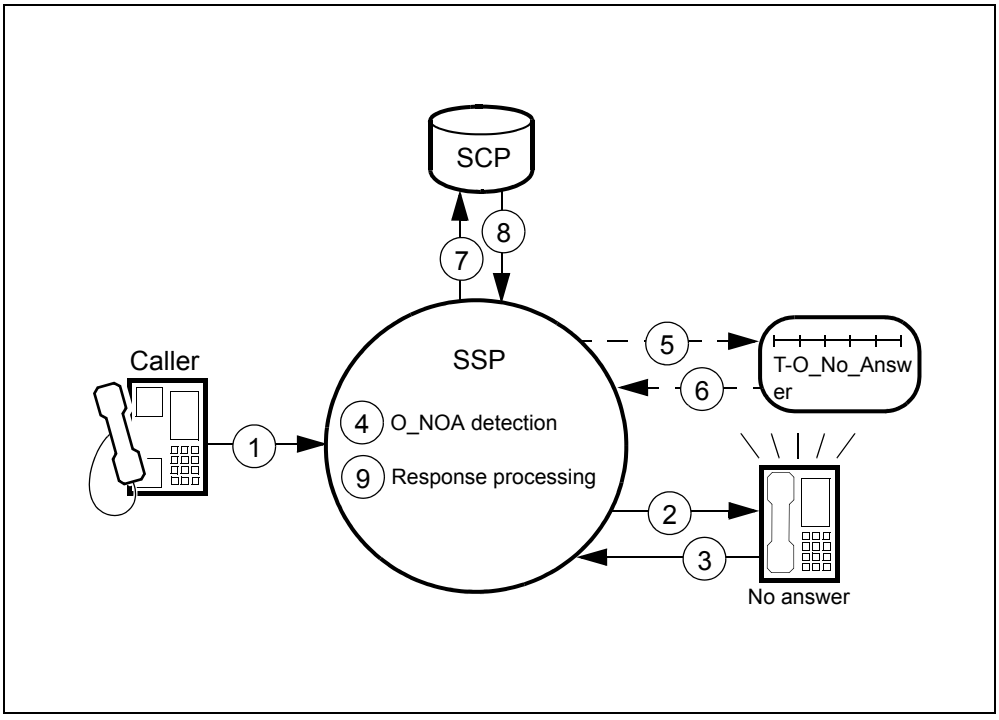
7.18.8.1 O_No_Answer basic call

Figure 32 on page 378 describes the basic call scenario where an originating agent (a calling party) attempts to call a terminating agent (a called party) that is not answering at that moment. During the attempt, the O_No_Answer trigger is detected and processed.

1. The calling party dials the called party DN.
2. The SSP attempts to establish connection with the called party.
3. An indication of called party on-hook is sent to the SSP.
4. The O_No_Answer trigger is detected when audible ringing tone is received by the calling party.
5. The T-O_No_Answer trigger timer is started by the SSP.
6. The T-O_No_Answer trigger timer expires.
7. The O_No_Answer trigger request message is sent to the SCP. The SSP does not interrupt the called party station ringing tone already in progress.

8. The SCP sends an O_No_Answer response to the SSP with the instructions to continue call processing.
9. The O_No_Answer response is decoded and call processing is resumed according to the instructions contained in the response (Analyze_Route, Continue or Send_to_Resource).

Figure 32 O_No_Answer basic call



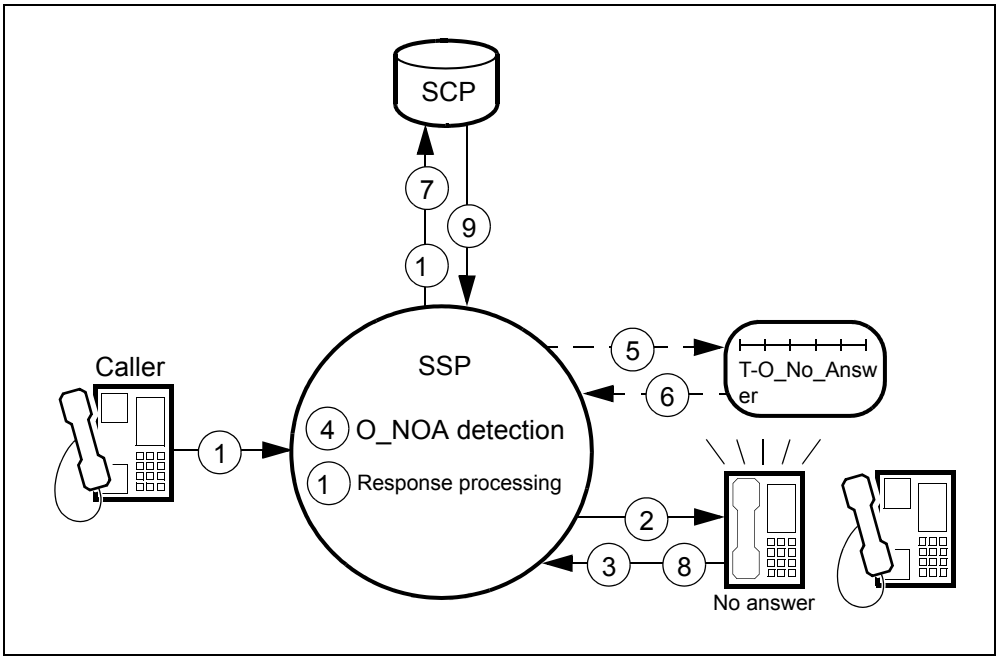
7.18.8.2 O_No_Answer terminating agent goes off-hook

Figure 33 on page 379 describes the call scenario where an originating agent (a calling party) attempts to call a terminating agent (a called party) that is not answering at that moment. During the attempt, the O_No_Answer trigger is detected, a timer is started and expires, and an O_No_Answer trigger request message is sent to the SCP. Before the O_No_Answer response is received, the terminating agent goes off-hook (answers the call).

1. The calling party dials the called party DN.
2. The SSP attempts to establish connection with the called party.
3. An indication of called party on-hook is sent to the SSP.
4. The O_No_Answer trigger is detected when audible ringing tone is received by the calling party.
5. The T-O_No_Answer trigger timer is started by the SSP.
6. The T-O_No_Answer trigger timer expires.

7. The O_No_Answer trigger request message is sent to the SCP. The SSP does not interrupt the called party station ringing tone already in progress.
8. The called party answers (goes off-hook). The call completes and all resources used by the O_No_Answer processing are cleared including the called party resources.
9. The SCP sends an O_No_Answer response to the SSP with the instructions to continue call processing.
10. The SSP receive the O_No_Answer response and discards it since the trigger processing waiting for this response has been canceled.

Figure 33 O_No_Answer terminating agent goes off-hook



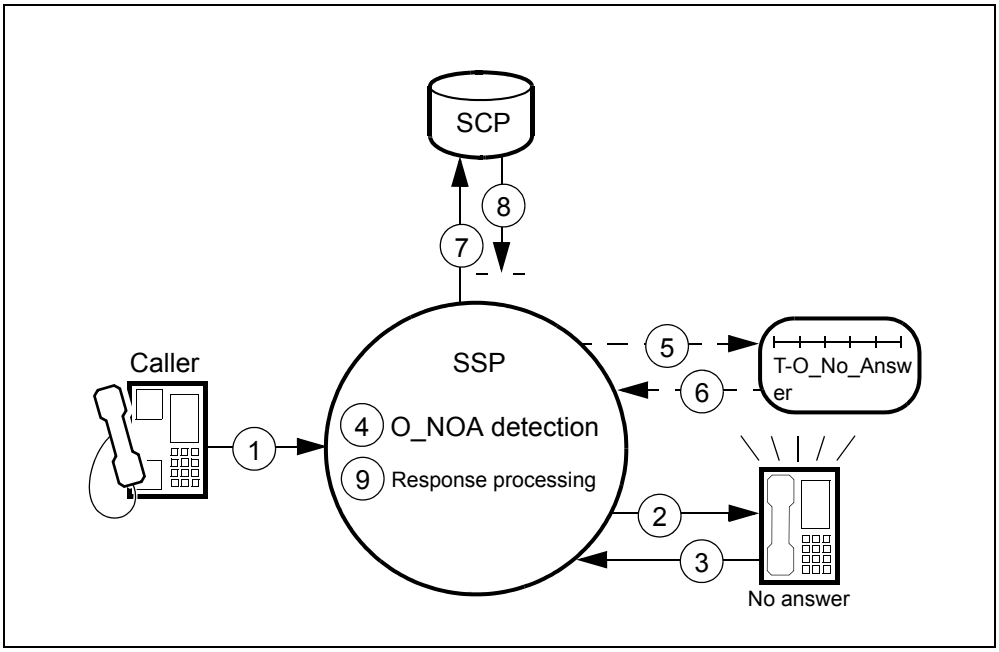
7.18.8.3 O_No_Answer SCP response error

Figure 34 on page 380 describes the call scenario where an originating agent (a calling party) attempts to call a terminating agent (a called party) that is not answering at that moment. During the attempt, the O_No_Answer trigger is detected, the timer is started and expires, and an O_No_Answer trigger request message is sent to the SCP. Technical difficulties prevent the SSP from getting a valid response message.

1. The calling party dials the called party DN.
2. The SSP attempts to establish connection with the called party.
3. An indication of called party on-hook is sent to the SSP.
4. The O_No_Answer trigger is detected when audible ringing tone is received by the calling party.

5. The T-O_No_Answer trigger timer is started by the SSP.
6. The T-O_No_Answer trigger timer expires.
7. The O_No_Answer trigger request message is sent to the SCP. The SSP does not interrupt the station ringing tone to the called party that is already in progress.
8. The SCP sends an O_No_Answer response message to the SSP with the instructions to continue call processing. Due to technical difficulties, the SSP does not receive the SCP response, or the response contains an error.
9. The SSP terminates O_No_Answer trigger processing and clears all resources. This occurs when the AIN T1 response timer expires or when the SCP response contains errors. Audible ringing tone is still received by the calling party.

Figure 34 O_No_Answer SCP response error



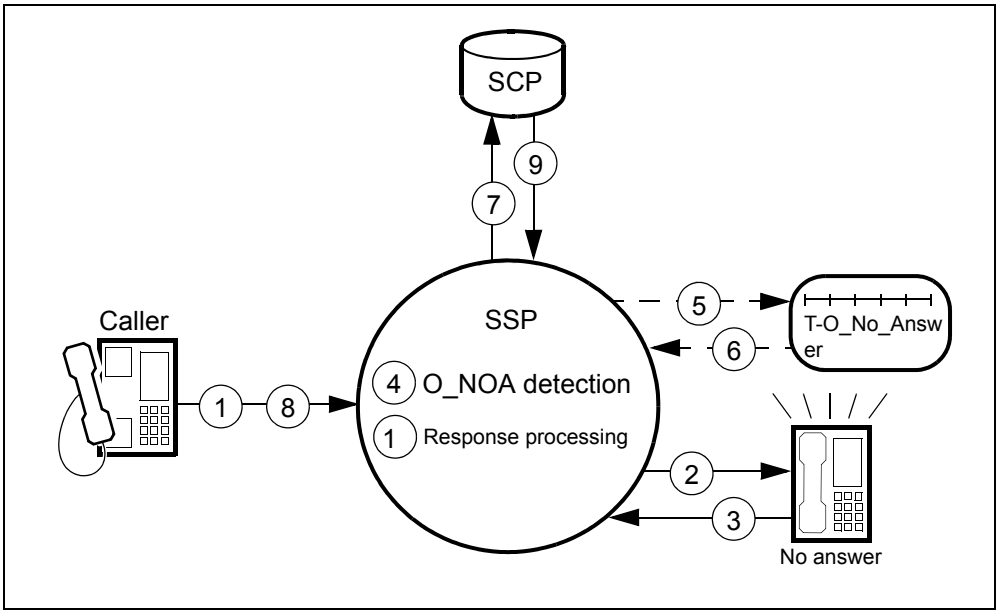
7.18.8.4 O_No_Answer originating agent goes on-hook

Figure 33 on page 379 describes the call scenario where an originating agent (a calling party) attempts to call a terminating agent (a called party) that is not answering at that moment. During the attempt, the O_No_Answer trigger is detected, a timer is started and expires, and an O_No_Answer trigger request message is sent to the SCP. Before the O_Called_Party_Busy response is received, the originating agent goes on-hook.

1. The calling party dials the called party DN.
2. The SSP attempts to establish connection with the called party.
3. An indication of called party on-hook is sent to the SSP.

4. The O_No_Answer trigger is detected when audible ringing tone is received by the calling party.
5. The T-O_No_Answer trigger timer is started by the SSP.
6. The T-O_No_Answer trigger timer expires.
7. The O_No_Answer trigger request message is sent to the SCP. The SSP does not interrupt the station ringing tone to the called party that is already in progress.
8. The calling party hangs up. All resources used by the O_No_Answer processing are cleared.
9. The SCP sends an O_No_Answer response to the SSP with the instructions to continue call processing.
10. The SSP receives the O_No_Answer response and discards it since the trigger processing waiting for this response has been canceled.

Figure 35 O_No_Answer originating agent goes on-hook



7.18.8.5 Limitations

See Section 20.21.2 “O_Called_Party_Busy and O_No_Answer” on page 695 for limitations associated with the O_No_Answer trigger.

8 Originating call model events

8.1 Overview

This chapter describes AIN Service Enablers' implementation of the following originating call model (OCM) events:

- Network_Busy
- O_Answer
- O_Called_Party_Busy
- O_No_Answer
- O_Disconnect
- O_Disconnect_Called
- Timeout Requested

This chapter covers Multiple extended TCAP transactions (METT).

8.2 Limitations

See Section 20.20 "Event limitations and restrictions" on page 692 for limitations associated with events.

8.3 Network_Busy event

This section describes the Network_Busy event.

8.3.1 Product view

The Network_Busy event implements the Network_Busy event FS.

The Network_Busy event consists of the following functions:

- arming the Network_Busy event
- Network_Busy event detection and processing
- Network_Busy event request message and processing
- Analyze_Route message and processing

- disconnect message and processing
- Send_To_Resource message and processing

8.3.1.1 Arming the Network_Busy event

The Network_Busy event is armed when the following two events occur:

- the SSP sends a trigger request message to the SCP
- the SCP responds with an Analyze_Route, Continue, or Forward_Call message and a Request_Report_ BCM_Event message.

8.3.2 Network_Busy event detection

This section describes the implementation of the Network_Busy Event detection and processing FSS.

See also Section 3.1.1 “Trigger and event detection points” on page 117.

The Network_Busy event is detected within the switch, when it processes the Analyze_Route or Forward_Call response message and determines that all suggested routes are busy or unavailable.

The Network_Busy event corresponds to “route exhaust,” that is, the event is detected when all trunk groups or virtual facility groups (VFG) in the suggested route lists are busy. A VFG is considered busy when its counter has reached its maximum value.

The Network_Busy event is also detected when Analyze_Route or Forward_Call processing and routing performs the following tasks:

- successfully seizes an outgoing ISUP or PRI trunk, and
- receives a message from a remote switch with a cause value indicating network busy, as specified by R5-28 [2468] in GR-1298, Issue 3, Revision 1, and
- for ISUP trunks only, all routes specified by the Analyze_Route or Forward_Call message have been attempted, or route advance capability to the next route is disabled

See Table 123 “ISUP Cause values not indicating Network Busy” on page 333 for ISUP cause values that apply to a user facility rather than a network, and Table 125 “PRI cause values indicating Network Busy” on page 384 for PRI cause values that indicate network busy.

Table 125 PRI cause values indicating Network Busy

PRI cause value	Description
34	ISDN no channel or circuit available

Table 125 PRI cause values indicating Network Busy (Continued)

PRI cause value	Description
38	ISDN network out of order
41	ISDN temp fail
42	ISDN switch equipment congestion
47	ISDN resource unavailable
50	ISDN requested facility not subscribed
54	ISDN incoming calls barred
95	ISDN invalid message unspecified
96	ISDN mandatory info element is missing
98	ISDN message not compatible with state
111	ISDN protocol error unspecified
127	ISDN interworking unspecified

See also Section 6.9 “Alternate carrier routing” on page 329.

8.3.2.1 Network_Busy interactions

This section describes interactions with:

- the virtual facility group feature
- the AIN Essentials AFR trigger
- NARS

8.3.2.1.1 Virtual facility group When the call is routed to a busy virtual facility group (VFG), then the Network_Busy event is detected. When the VFG is not busy, the NEL remains open and any originating event, including Network_Busy, remains armed.

8.3.2.1.2 AIN Essentials AFR trigger During an extended transaction, an AIN Essentials AFR trigger can be encountered while an AIN Service Enablers NEL is active. The AIN Essentials AFR trigger occurs prior to detection of the Network_Busy event. When this occurs, the AIN Essentials AFR query is sent, and the AIN Service Enablers Network_Busy event remains armed.

8.3.2.1.3 NARS See Section 1.12 “Network access registers” on page 125.

8.3.3 Network_Busy event request message and processing

This section describes the implementation of the Network_Busy EDP-R message and processing FSS.

When the Network_Busy EDP-R is encountered, the DMS SSP performs the following operations:

- sends the Network_Busy message to the SCP or adjunct
- increments the serial trigger count

See Section 6.4.4.4 “Network_Busy event request message” on page 206.

8.3.4 Analyze_Route message and processing

This section describes the implementation of the generic Analyze_Route message and processing FSS.

When the SSP receives an Analyze_Route message in response to a Network_Busy EDP-R, the SSP processes the Analyze_Route message.

See Section 6.6.1 “Analyze_Route message” on page 258.

VFGs encountered during an open NEL transaction are released when processing an Analyze_Route message. Refer to Section 8.4.4 “Analyze_Route message and processing” on page 389 for further details on releasing a VFG.

8.3.5 Disconnect message and processing

This section describes the implementation of the disconnect message and processing FSS.

When the SSP receives a disconnect message in response to a Network_Busy EDP-R, the behavior is the same as is currently supported for all other triggers that can receive the disconnect response. The SSP closes the transaction.

See Section 6.6.7 “Disconnect message” on page 285.

8.3.6 Send_To_Resource message and processing

When the SSP receives a Send_To_Resource message, following a Network_Busy EDP-R, the SSP closes the extended transaction and processes the Send_To_Resource message. When the SSP receives a Send_To_Resource message in a conversation package, following a Network_Busy EDP-R message, the extended transaction remains open.

See Section 12.1 “STR message / Internal resource” on page 491.

VFGs encountered during an open NEL transaction are released when processing an Analyze_Route message. Refer to Section 8.4.4 “Analyze_Route message and processing” on page 389 for further details on releasing the VFG.

8.4 O_Called_Party_Busy event

This section describes the O_Called_Party_Busy event.

8.4.1 Product view

The O_Called_Party_Busy event implements the O_Called_Party_Busy event FS.

The O_Called_Party_Busy event consists of the following functions:

- O_Called_Party_Busy event detection
- Analyze_Route message and processing
- O_Called_Party_Busy event request message and processing
- continue message and processing
- Send_To_Resource message and processing
- virtual directory number

8.4.2 O_Called_Party_Busy event detection

This section describes the implementation of the O_Called_Party_Busy event detection FSS.

The O_Called_Party_Busy event can only be detected when the call is offered to a terminating agent on a switch, or when the call is sent through the network using an ISUP or PRI trunk. When an event is detected, the serial trigger count increments.

The SSP detects the O_Called_Party_Busy event when it is armed and one of the following conditions occur:

- the call is sent to a line or BRI that is busy

  The determination of busy is highly dependent upon feature interactions. Some feature interactions are shown in Table 126.

- the line is determined to be out of order or undergoing maintenance
- authority to route the call terminating user is denied, this includes features such as

  — CLASS anonymous call rejection (ACRJ)

  — CLASS selective call rejection (SCRJ)

  — denied termination (DTM)

  — suspended line

  — requested suspended line

  — plug up (PLP)

  For a more exhaustive list, see Chapter 21: "AIN interactions introduction" on page 717 through Chapter 2: "AIN/DMS-100 interactions (S to Z)" on page 167.

- a cause value specified in Table 127 on page 389 is returned in either an ISUP or PRI message
- an Authorize_Termination message is received in response to a Termination_Attempt message, where the UserID corresponds to an AIN VDN

Table 126 Determination of O_Called_Party_Busy based on feature

Feature	Determination of busy
Call Waiting (CWT)	A CWT line is busy when one party is connected and a second line is on hold. A CWT line is busy when one party is connected and Cancel Call Waiting is in effect for the call.
Hunting	When all members of a hunt group are busy.
Make Set Busy (MSB)	When the Make Set Busy feature has been activated.
Note: A complete list of feature variants is given in Chapter 21: "AIN interactions introduction" on page 717 through Chapter 2: "AIN/DMS-100 interactions (S to Z)" on page 167.	

Table 127 Cause values indicating O_Called_Party_Busy

Cause value	Cause value description
17	User busy
21	Call rejected
27	Destination out of order
Note: Virtual directory number requires different treatment. See Section 8.4.7 “Virtual directory number” on page 392.	

8.4.3 O_Called_Party_Busy event request message and processing

This section describes the implementation of the O_Called_Party_Busy EDP-Request Message and Processing FSS.

See Section 6.4.4.7 “O_Called_Party_Busy event request message” on page 209.

8.4.4 Analyze_Route message and processing

This section describes the implementation of the generic Analyze_Route message and processing FSS, and the specific Analyze_Route message and processing FSS. See Section 6.6.1 “Analyze_Route message” on page 258.

The processing of the Analyze_Route response message for the O_Called_Party_Busy event (when a VFG is encountered after the NEL is received from the SCP or adjunct in a message with an RRBCME component) performs the following operations:

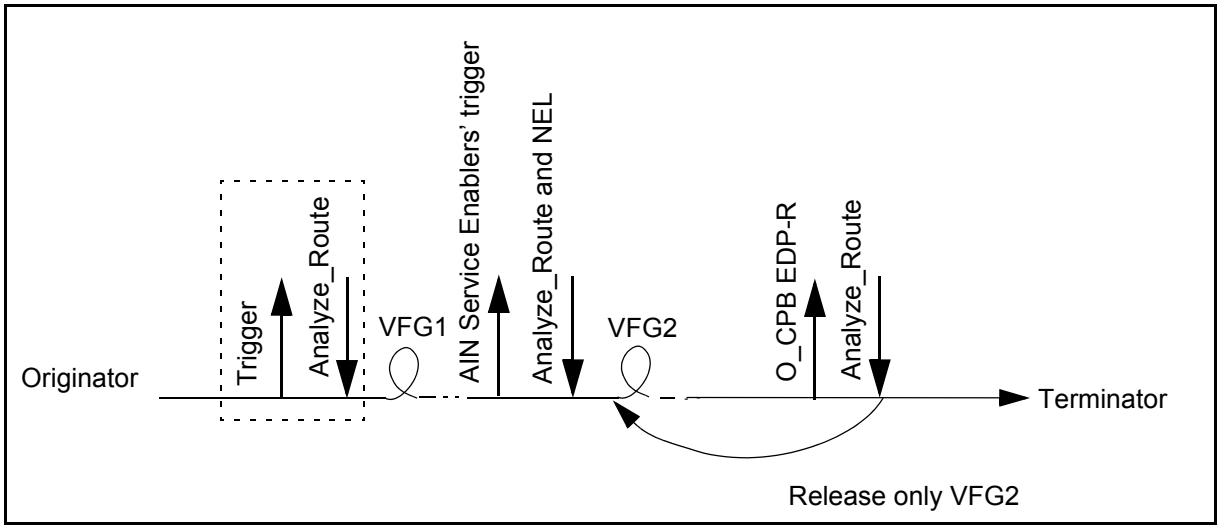
- any member of a VFG that is allocated during the open NEL is released from the call (reducing the number of active calls using the VFG)
- the originating characteristics of the agent that encountered the first VFG during the open NEL transaction are restored so they can be used in subsequent response translations and query parameter population
- AIN call data (such as response parameters) updated by subsequent AIN triggering in the VFG call leg, are discarded and replaced with the AIN call data that was in effect prior to the released VFGs
- individual or customer group-based triggers that are active when the first VFG is encountered (during the open NEL transaction) can still be detected

- the special billing number of any VFG that is released, is not used in subsequent billing
- AMA records generated as a result of throttling through the VFG, are marked as unanswered, even though the call can be answered in a subsequent leg and are appended with module code 204

Note: SMDR records generated by the VFG are marked as unanswered.

Figure 36 illustrates the (above) operations. Figure 36 shows that several VFGs can be encountered in the call. While processing the Analyze_Route response to the O_Called_Party_Busy EDP-R, only VFG2 is released because it is the one that is encountered after the response is received from the SCP or adjunct. Because VFG1 was the last triggering agent before receiving the NEL, its originating characteristics (due to any VFG attributes such as LINEATTR, customer group, NCOS, PICs) are used in the response translation of the Analyze_Route message.

Figure 36 Releasing all VFGs (in the same OCM) for the O_Called_Party_Busy event



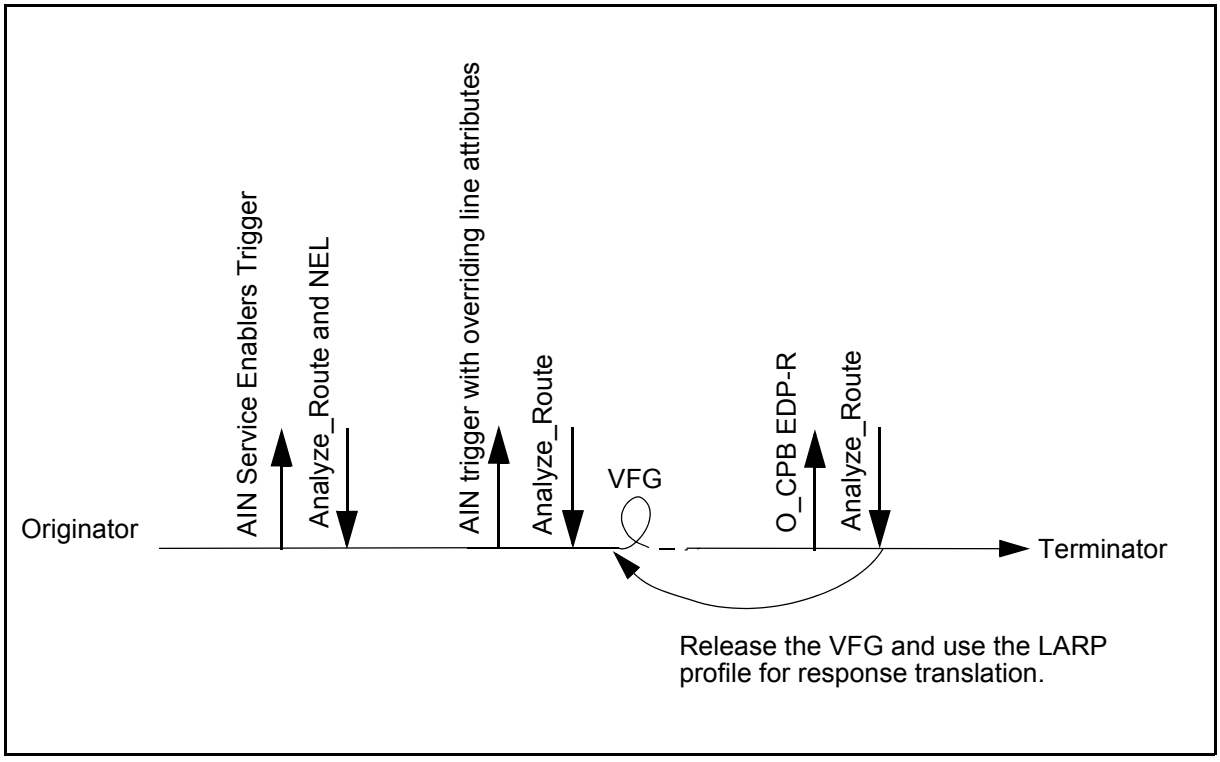
8.4.4.1 Interactions with AIN triggers with overriding line attributes

When a NEL is active, the O_Called_Party_Busy event can be armed or detected after a call encounters an AIN trigger with overriding line attributes. See Figure 37 on page 391.

The trigger item provisioning interface implements trigger-specific line attributes by datafilling the LARP option on an SDS trigger item. For the datafill steps required by trigger SDS with the LARP option, see Section 30.2 “Trigger item provisioning interface” on page 764.

The trigger group provisioning interface implements trigger-specific line attributes by datafilling table PODPATTR for an SDS trigger defined in a trigger group. See Section 30.3 “Trigger group provisioning interface” on page 784 for the datafill steps required by trigger SDS with an applicable PODPATTR.

Figure 37 VFG interaction with an AIN trigger with overriding line attributes when NEL is active



8.4.4.2 Interactions with redirection

VFGs encountered in an earlier call leg always remain on the call. This applies to any redirection that causes a new call leg creation including the following activities:

- switch-based features, such as call forward (CFW)
- AIN-based redirection, for example, redirections caused by a Forward_Call response

8.4.5 Continue message and processing

This section describes the implementation of the O_Busy continue message and processing FSS and the events and continue message and processing FSS.

See Section 6.6.3 “Continue message and processing” on page 279.

8.4.6 Send_To_Resource message and processing

When the SSP receives a Send_To_Resource message in response to a O_Called_Party_Busy EDP-R message, the SSP closes the extended transaction and processes the Send_To_Resource message.

See Section 12.1 “STR message / Internal resource” on page 491.

8.4.7 Virtual directory number

When AIN triggers at the Termination_Attempt_Trigger (TAT), an Authorize_Termination message is received. When this message is received, and the TAT agent is an AIN virtual directory number (VDN), then treatment is applied. The AIN Essentials offering is not compliant with the specified AINF treatment. The cause value associated with AINF is “normal call clearing”. The AIN Service Enablers modifies the treatment to be consistent with “no route to destination” (that is, blank directory number [BLDN]). The modified treatment is required to allow the O_Called_Party_Busy event to be encountered for VDNs in this situation.

Note: This is the only scenario that causes the O_Called_Party_Busy event to occur when the cause value is set at “no route to destination” (that is, when received over an ISUP or a real BLDN is encountered, O_Called_Party_Busy is not triggered).

8.5 O_Answer event

This section describes the O_Answer event.

8.5.1 Product view

The O_Answer event implements the O_Answer event FS.

The O_Answer event consists of the following functions:

- OA event detection and processing
- O_Answer message and processing

8.5.2 O_Answer event detection

This section describes the implementation of the O_Answer event detection FSS.

The DMS SSP detects the O_Answer event when one of the following conditions occurs:

- the switch receives an indication that the terminating party has gone off-hook
- the switch receives a connect message from an ISDN user

- the switch receives an answer message (ANM) for ISUP trunks in response to an initial address message (IAM)
- the switch has received an answer indication on a conventional trunk (PTS) or private facility trunk

8.5.3 O_Answer message and processing

This section describes the implementation of the O_Answer message and processing FSS.

When the O_Answer event is detected, the SSP sends the O_Answer event notification message to the SCP or adjunct, and continues to process the call.

See also Section 6.4.4.8 “O_Answer event notification message” on page 209.

8.6 O_No_Answer event

This section describes the O_No_Answer event.

8.6.1 Product view

The O_No_Answer event implements the O_No_Answer event FS.

The O_No_Answer event can only be detected when the call is offered to a terminating agent on a switch, or when the call is routed through the network using an ISUP trunk, a PRI trunk, or a supported PTS trunk (as listed in Table 15 “Terminating trunk agents supported by the O_NoAnswer trigger” on page 142. When an event is detected, the serial trigger count increments. When the call is routed through the network using an unsupported PTS trunk, the O_No_Answer event cannot be detected.

The O_No_Answer event consists of the following functions:

- O_No_Answer event detection
- Analyze_Route message and processing
- O_No_Answer event request message and processing
- continue message and processing
- Send_To_Resource message and processing
- O_No_Answer error handling

8.6.2 O_No_Answer event detection

This section describes the implementation of the O_No_Answer Event detection and provision FSS.

The SSP detects the O_No_Answer event when the T-ONoAnswer event timer expires. The value of the timer is derived in the following order:

1. The value of parameter Request_Report_BCM_Event ONoAnswerTimer, when present.
2. The value of parameter AIN_O_NO_ANSWER_EVENT_TIMER in table OFCENG, when provisioned.
3. Default value of 18 seconds.

The timer is initiated when the call is routed. When routing over ISUP, it starts the timer upon receipt of the address complete message (ACM).

The timer is not initiated when an unsupported PTS trunk is encountered.

After the timer is initiated, it is stopped when any of the following events occur:

- O_Answer is detected as specified in Section 8.5 “O_Answer event” on page 392
- a route busy event is detected when the originating call portion receives a report of T_Busy, or upon receiving indication that the route is busy at another SSP
- the O_Called_Party_Busy event is detected as specified in Section 8.4 “O_Called_Party_Busy event” on page 387
- the originator abandons the call
- when an ACM or call progress message is received with an optional backward call indicator set to user-network interaction

Note: When a call is sent through a network using PTS trunks, the O_No_Answer event relies on notification from the far-end switch to correctly process the call. Callers can experience undesirable call behavior when the far-end switch fails to correctly notify the O_No_Answer event of the status of the call. For example, when the call interacts with the far-end switch to get an announcement and the answer indication is not sent over a PTS trunk, the call can be suddenly redirected during the announcement, once the T-ONoAnswer event timer expires.

On detecting the O_No_Answer event, the SSP sends the O_No_Answer EDP-R message to the SCP or adjunct, and continues alerting the called party.

8.6.3 O_No_Answer event request message and processing

This section describes the implementation of the O_No_Answer EDP-R message and processing FSS.

See Section 6.4.4.10 “O_No_Answer event request message” on page 211.

8.6.3.1 O_No_Answer called party answers

When the called party answers the call while waiting for an SCP response, the action performed depends on the SCP response and package type as shown in Table 128.

Table 128 O_No_Answer called party answers

SCP message	Package type	Action
Analyze Route (AR) or Continue	Response	Close the transaction
Analyze Route (AR) or Continue + Request_Report_ BCM_Event	Conversation	Send CLOSE message in response with CloseCause=calledPartyAnswered.
Response	Send_To_Resource (STR)	Discard STR message
Send_To_Resource (STR)	Conversation	Send Resource Clear message in response with ClearCause=calledPartyAnswered.
Send_Notification or ACG	Conversation	The DMS SSP will process the ACG request. For Send Notification, a Termination Notification message is sent to the SCP with exception set when no other SN has been requested for this transaction.

8.6.4 Analyze_Route message and processing

This section describes the implementation of the generic Analyze_Route message and processing FSS and the Specific Analyze_Route message and processing FSS.

The processing of the Analyze_Route response message for the O_No_Answer event performs supplemental processing when a VFG is encountered during an open NEL transaction. This supplemental processing is equivalent to processing of the O_Called_Party_Busy event. See Section 8.4.3 “O_Called_Party_Busy event request message and processing” on page 389 for a complete description.

See Section 6.6.1 “Analyze_Route message” on page 258.

8.6.5 Continue message and processing

This section describes the implementation of the O_No_Answer and continue message and processing FSS and the events and continue message and processing FSS.

See Section 6.6.3 “Continue message and processing” on page 279

8.6.6 Send_To_Resource message and processing

When the SSP receives a Send_To_Resource message in response to a O_No_Answer event request message, the SSP closes the extended transaction and processes the Send_To_Resource message.

See Section 12.1 “STR message / Internal resource” on page 491.

VFGs encountered during an open NEL transaction are released when processing an Analyze_Route message. Refer to Section 8.4.4 “Analyze_Route message and processing” on page 389 for further details on releasing the VFG.

8.7 Attendant console interactions with OCM events

For console extended calls, the triggers are separated for each leg of the call. When the call triggers on SDS or N11 and the console disconnects, the NEL is closed (because at this point the triggering agent is no longer part of the call).

8.7.1 O_Called_Party_Busy event

All new calls that terminate to the attendant console are put in the call queue in the order of their arrival. While queued, audible ringback is provided to the caller. When incoming calls have waited in queue longer than the specified threshold (up to 17 minutes), the calls are diverted to either a busy tone or an announcement.

8.7.2 O_No_Answer event

See Section 20.6 “Attendant console limitations” on page 682.

8.7.3 O_Answer event

For calls terminating on the attendant console, the O_Answer event is detected and the SSP sends the answer message to the SCP when the call is answered.

8.8 Serial triggering during extended transaction

When a TDP-R or EDP-R is detected, the serial trigger count increments. The serial trigger count is maintained for each call leg.

When the serial triggering limit is exceeded during an extended transaction due to Next_Event_List processing, call processing is handled based on the following scenarios:

- O_No_Answer EDP-R exceeds triggering limit:

  The EDP-R is not sent; audible ringing continues to be applied to the terminator; and a close message is sent to the SCP with CloseCause=EDPs completed.

- O_Called_Party_Busy EDP-R exceeds triggering limit:

The EDP-R is not sent; busy treatment is applied to the originator; and a CLOSE message is sent to the SCP with CloseCause=CallTerminated. All open NELs related to the call are closed immediately with CloseCause=CallTerminated.

- Network_Busy EDP-R exceeds triggering limit:

  The EDP-R is not sent; GNCT treatment is applied to the originator; and a close message is sent to the SCP with CloseCause=CallTerminated. All open NELs related to the call are closed immediately with CloseCause=CallTerminated.

- R01 or R02 trigger exceeds triggering limit during extended transaction:

  The TDP-R is not sent; AINF treatment is applied to the originator; and a close message is sent to the SCP with CloseCause=CallTerminated.

8.9 Query processing after serial triggering

This function ensures that the call model uses proper data when triggering in the originating call portion, after the SEND_CALL PIC has been encountered.

Triggering that occurs in the originating call model (OCM) contains data received in previous responses in the OCM. Data received in responses in the TCM are not used, unless a call triggers in the OCM after a Forward_Call.

Note: The TCM parameter is supported in the Termination attempt message for the TKTERM trigger.

Section 8.9.1 “Example 1” on page 397 and Section 8.9.2 “Example 2” on page 399 illustrates two scenarios.

8.9.1 Example 1

See Figure 38 “Ignoring TCM data in processing NELs” on page 399. This example illustrates a scenario where a call is processed in the originating call model, then in the terminating call model, and then back in the originating call model. The figure shows that call processing does not use information from the terminating call model to process the call. Rather, it continues to use information from the preceding OCM processing.

1. Party A encounters a digit trigger at the SSP. The Info_Analyzed query message is sent to SCP 1.
2. SCP 1 responds with an Analyze_Route message and an Request_Report_BCM_Event message, arming the O_Called_Party_Busy event. The Analyze_Route message also sets the CallingPartyID parameter to party C and sets the CalledPartyID parameter to party B.
3. The call is sent according to the instructions in the Analyze_Route message to party B.

4. The Termination_Attempt trigger is encountered and the Termination_Attempt query message is sent to SCP 2.
5. SCP 2 responds with an Authorize_Termination message that sets parameter CallingPartyID to party D.
6. Party B is busy.
7. The O_Called_Party_Busy event is detected and the appropriate query message is sent to SCP 1.
8. SCP 1 responds with an Analyze_Route message setting parameter CalledPartyID to party F.

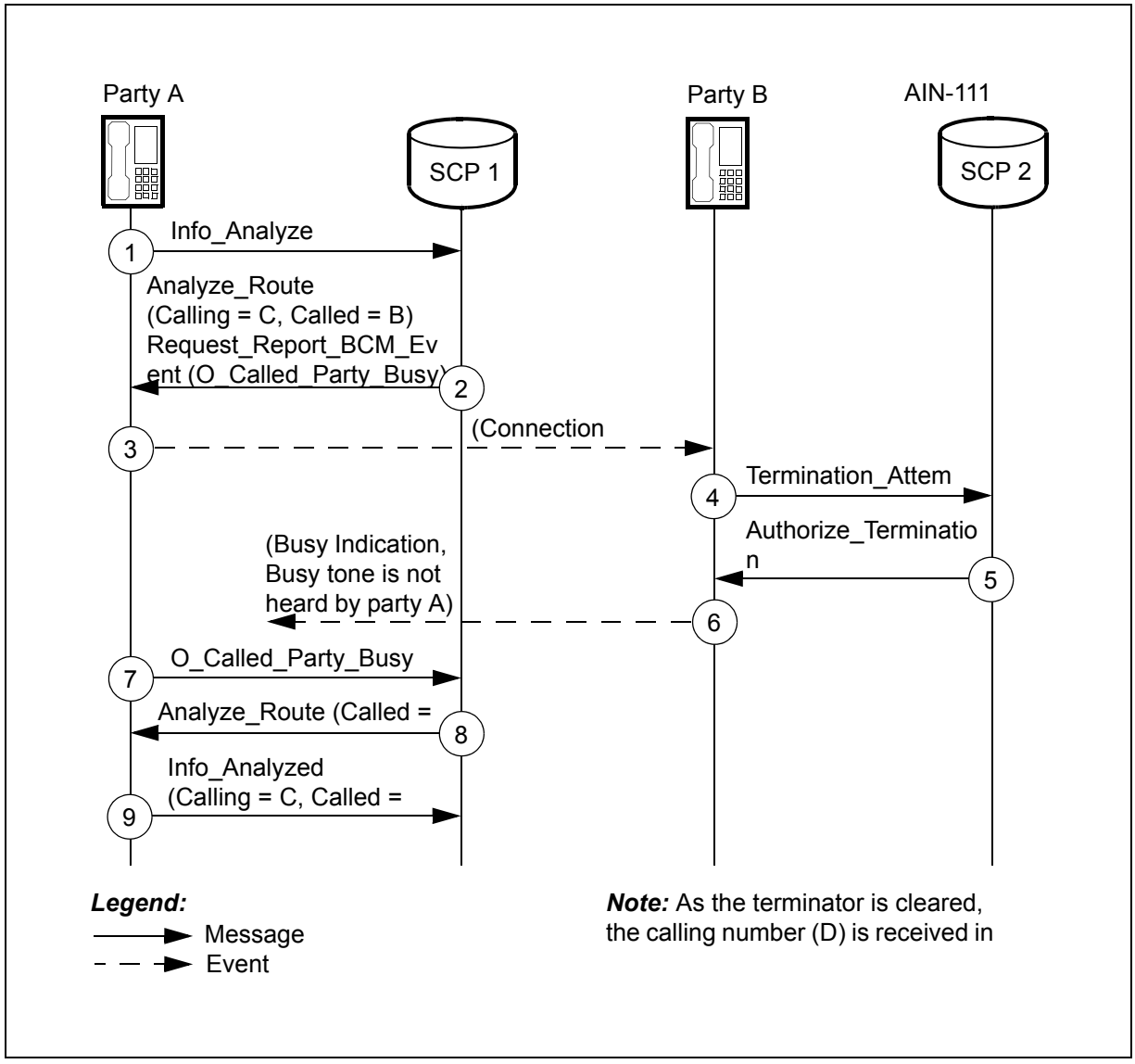
   Note: SCP 1 does not update parameter CallingPartyID.

9. Another digit trigger is encountered at the SSP. Another Info_Analyzed query message is sent to SCP 1, setting parameter CallingPartyID to party C and sets parameter CalledPartyID to party F.

In the preceding example, steps 1 to 3, and steps 7 to 9 occur in the originating call model, while steps 4 to 6 occur in the terminating call model.

Note: In step 9, parameter CallingPartyID is set to party C from step 2 in the originating call model, rather than party D from step 5 in the terminating call model.

Figure 38 Ignoring TCM data in processing NELs



8.9.2 Example 2

See Figure 39 “Using TCM data for processing NEL received in forwarded call” on page 401. This example illustrates a scenario where a call is processed in the terminating call model, and then in the originating call model. Figure 33 shows that call processing does use information from the terminating call model to continue processing the call.

1. Party A calls party B.
2. Trigger Termination_Attempt is encountered and the Termination_Attempt query message is sent to SCP 1.

3. SCP 1 responds with a Forward_Call message and an Request_Report_BCM_Event message, arming the O_No_Answer event. The Forward_Call message also sets parameter CallingPartyID to party D and sets parameter CalledPartyID to party X.
4. The call is forwarded to party X according to the instructions in the Forward_Call message.
5. The timer for party X expires.
6. The O_No_Answer event is detected and the appropriate query message is sent to SCP 1.
7. SCP 1 responds with an Analyze_Route message setting parameter CalledPartyID to party F.

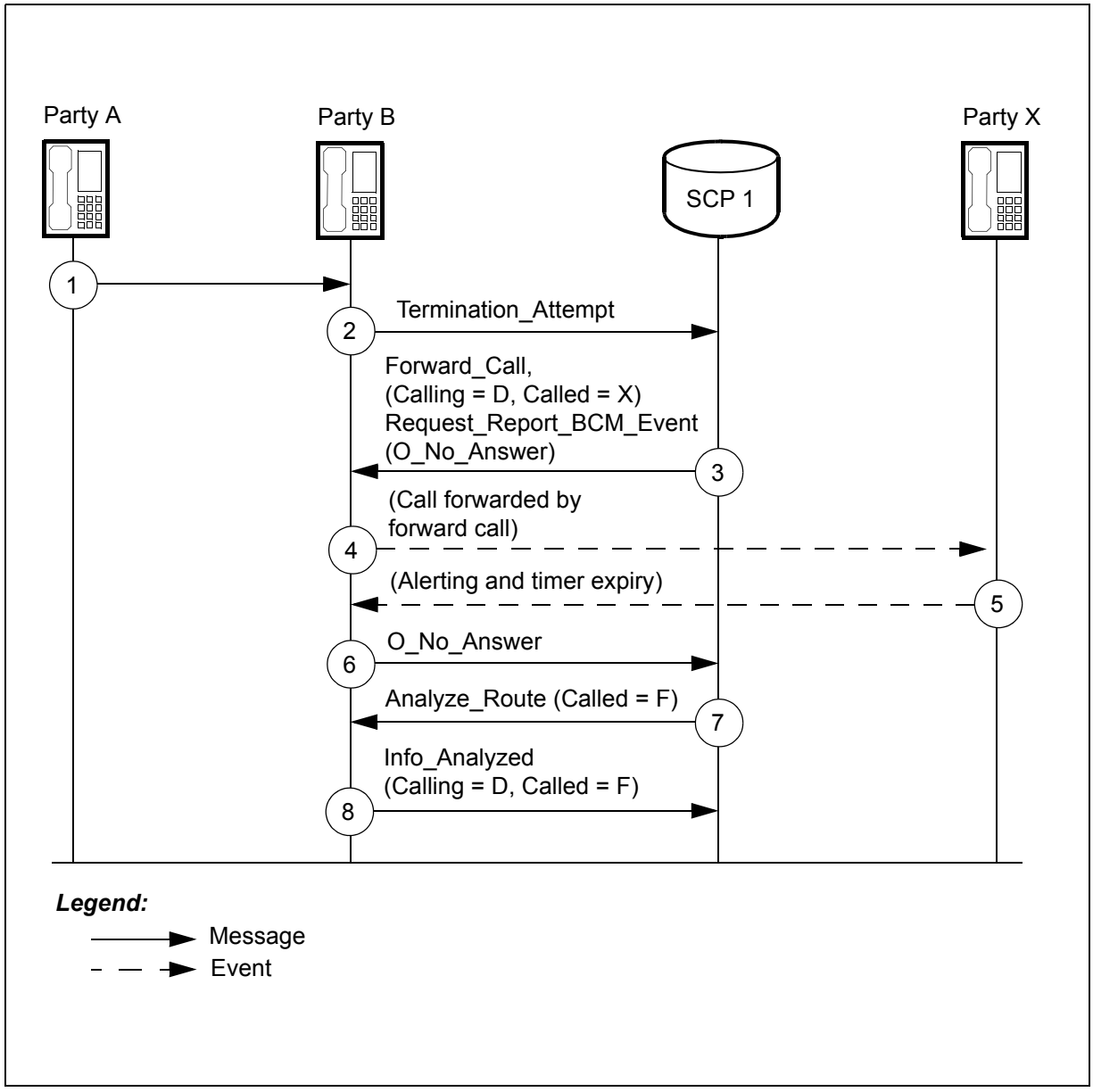
   Note: SCP 1 does not update parameter CallingPartyID.

8. Another digit trigger is encountered at the SSP. An Info_Analyzed query message is sent to SCP 1, setting parameter CallingPartyID to party C and sets parameter CalledPartyID to party F.

In the preceding example, steps 1 to 5 occur in the terminating call model, while steps 6 to 8 occur in the originating call model. Note that in step 8, the CallingPartyID parameter is set to party D, from step 3 in the terminating call model.

Note: In step 8, parameter CallingPartyID is set to party D, from step 3 in the terminating call model.

Figure 39 Using TCM data for processing NEL received in forwarded call



8.10 Multiple extended TCAP transactions in OCM

This feature provides SSP support for multiple extended TCAP transactions (METT) in the originating call half (OCM). Multiple transactions related to the same originating call half can remain open at the same time. Events related to different transactions can remain armed simultaneously.

OCM multiple extended transactions are supported for the following events:

- O_Called_Party_Busy
- O_Answer
- Network_Busy
- O_No_Answer

8.10.1 Behavior of METT in OCM

The second NEL in the OCM gets armed. The NELs that are armed as part of METT in OCM are detected or processed as previously described in this chapter.

METT in OCM does not change the arming of multiple events in an RRBCME message.

The number of NELs that can be armed by METT in OCM is limited by the MAX_SERIAL_TRIGGER_COUNT, which is datafilled in table OFCENG. The default value is 6. The MAX_SERIAL_TRIGGER_COUNT can be set to 8, which is the maximum value allowed for each call leg.

During the processing of METT in OCM, the SSP or SCP can disarm all NELs. When all NELs disarm, the SSP sends a CLOSE message (reasons for sending this message can vary).

The behavior of METT in OCM relates to the behavior of events. Table 129 describes the behavior of events.

Note: Backward Event Direction: In the following examples, an event is considered an ‘event in the backward direction’ when notification that an event occurred propagates from the terminating party to the originating party. When the SSP detects events occurring in the backward direction, the SSP offers these events to the transaction from the newest transaction to the oldest transaction. When the transaction arms the event as an EDP-N, the SSP reports the event. The following events are considered ‘events in the backward direction’: Network_Busy (EDP-R), O_Called_Party_Busy (EDP-R), and O_Answer (EDP-N).

Table 129 Call scenarios

Event scenario	Behavior (See call scenarios that follow this table.)
Multiple O_No_Answer events with different T-ONoAnswer timer values	When multiple O_No_Answer events are armed as part of METT in OCM, the detection of the event depends on the T-ONoAnswer event timer values of the individual events. Events are processed one at a time as their timer expires. METT in OCM processes all O_No_Answer events one at a time.
Multiple O_No_Answer events with equal T-ONoAnswer timer values	When two or more O_No_Answer events have equal T-ONoAnswer event timer values, METT in OCM processes the armed O_No_Answer event as part of an older transaction. The response from the SCP decides how other expired events are processed. SCP responses follow.
Multiple O_No_Answer events with equal T-ONoAnswer timer values with Analyze_Route message in response to an older O_No_Answer event request	When the SSP receives a Analyze_Route message in response to a older transaction O_No_Answer event request, the call routes to the party as indicated in the CalledPartyID present in the Analyze_Route response message. When the call routes to the CalledParty, the SSP cancels active O_No_Answer timers and closes all extended transactions that are newer than the processed extended transaction.

Table 129 Call scenarios (Continued)

Event scenario	Behavior (See call scenarios that follow this table.)
Multiple O_No_Answer events with equal T-ONoAnswer timer values with Continue message in response to an older O_No_Answer event request	When the SSP receives a Continue message in response to an older transaction O_No_Answer event request, METT in OCM processes the expired O_No_Answer events that were armed in the newer transaction. When there are no expired O_No_Answer events the call continues. The SSP allows all other timers to continue, and processes each of the events in turn. Events where T-ONoAnswer event timers expire during the processing of any other events apply. When multiple O_No_Answer events are armed, the call scenario can be complex. When the SSP receives an Analyze_Route response with different Called_Party_IDs from the SCP for the O_No_Answer event requests, the call is offered to the SSP. The SSP routes the call to the CalledParty indicated in the Analyze_Route in response to a newer O_No_Answer event request. At any time before the call attempt is answered, an older transaction O_No_Answer event response can redirect the call. The SSP gives priority to the routing attempt associated with the older transaction. The routing attempt associated with the newer transaction is taken down.
Multiple O_No_Answer events with equal T-ONoAnswer timer values with Send_To_Resource (without extended ringing) message in response to O_No_Answer Event Request*	When the SSP receives a Send_To_Resource message in response to an older transaction O_No_Answer event, the SSP cancels active O_No_Answer timers and closes all extended transactions that are newer than the processed extended transaction. The SSP then processes the Send_To_Resource message. While the SSP processes the Send_To_Resource message, any T-ONoAnswer event timer expiries do not process until Send_To_Resource message processing completes. When the Send_To_Resource message processes and when a T-ONoAnswer event timer expires, the message does not process until the Send_To_Resource message processes.

Table 129 Call scenarios (Continued)

Event scenario	Behavior (See call scenarios that follow this table.)
Multiple O_No_Answer events with equal T-ONoAnswer timer values with Send_To_Resource message with Extended Ringing parameter in response to an O_No_Answer Event request	When the SSP receives a Send_To_Resource message with an Extended Ringing parameter in response to a older transaction O_No_Answer event, the events armed in the newer transactions remain open and the SSP processes the Send_To_Resource message. When the SSP processes the Send_To_Resource message, T-ONoAnswer event timer expiries do not process until Send_To_Resource messages process.
Multiple O_No_Answer events interaction with OCM triggers	When the originator subscribes to the O_No_Answer trigger and when multiple O_No_Answer events are armed, the SSP allows all timers to start simultaneously. Depending on No_Answer timer values, O_No_Answer events and triggers process one at a time upon their timer expiry. When the O_No_Answer trigger and event timers expire at the same time, the O_No_Answer trigger represents the oldest transaction O_No_Answer event. The routing attempt associated with the O_No_Answer trigger gets priority.
Multiple O_No_Answer events interaction with TCM trigger and events	When the terminator subscribes to the T_No_Answer trigger and multiple O_No_Answer events are armed, the SSP allows all timers to start simultaneously. Depending on No_Answer timer values, the SSP processes the events one by one as their timers expire. When the O_No_Answer event and the T_No_Answer trigger timers expire at the same time, the T_No_Answer trigger represents the newest transaction O_No_Answer event, and an O_No_Answer event response can redirect the routing attempt associated with T_No_Answer trigger processing. Similar interactions occur with O_No_Answer events armed by METT in OCM for a T_No_Answer: - trigger subscribed by the terminator - event armed in the terminating call half. Processing of the T_No_Answer event completes before the detection of the T_No_Answer trigger.

Table 129 Call scenarios (Continued)

Event scenario	Behavior (See call scenarios that follow this table.)
Error condition when processing O_No_Answer event request	When an error occurs while the SSP waits for the response from the SCP to a O_No_Answer EDP-R in a newer open extended transaction, the SSP allows all other T-ONoAnswer timers to continue. The SSP processes each of those events accordingly.
Multiple O_Called_Party_Busy events	When METT in OCM arms multiple O_Called_Party_Busy events, the O_Called_Party_Busy event armed by the newest transaction detects the busy event first. Because O_Called_Party_Busy is an event in the backward direction, notification that a busy event occurred propagates from the terminating party to the originating party, traversing backwards from newer to older armed O_Called_Party_Busy events. Response processing for EDPRs follows.
Multiple O_Called_Party_Busy events with Analyze_Route message in response to an O_Called_Party_Busy event request	When the SSP receives a Analyze_Route message in response to a newer transaction O_Called_Party_Busy event request, the call routes to the party indicated in the CalledPartyID of the Analyze_Route response message. Depending on the state of the called party, the following behavior can occur: - Called Party Busy: When the called party is busy, the calling party does not get the busy treatment. The next oldest transaction arming the O_Called_Party_Busy event detects the event next. - Called Party Idle: When the called party is idle, the called party rings. When the called party answers, all extended transactions (older than the ones being processed) are closed. The SSP sends a CLOSE message to the SCP with an appropriate closeCause parameter.

Table 129 Call scenarios (Continued)

Event scenario	Behavior (See call scenarios that follow this table.)
Multiple O_Called_Party_Busy events with Continue message in response to an O_Called_Party_Busy event request	When the SSP receives a Continue message in response to a new transaction O_Called_Party_Busy event request, the next oldest transaction arming the O_Called_Party_Busy event detects the busy event next. When the older transaction O_Called_Party_Busy event request receives a Continue response, the previous (oldest) transaction detects the O_Called_Party_Busy event next. When all O_CPB events receive a Continue response, the events are detected from newer to older transactions, and the calling party routes to Busy treatment. When the SSP receives an Analyze_Route message in response to an O_Called_Party_Busy event request, the behavior is the same as given in the previous row.
Multiple O_Called_Party_Busy events with Send_To_Resource message in response to O_Called_Party_Busy event request	When the SSP receives a Send_To_Resource message in response to an O_Called_Party_Busy event request message, the older O_Called_Party_Busy event detection depends on the outcome of Send_To_Resource processing.
Multiple O_Called_Party_Busy events interaction with OCM busy triggers, TCM busy triggers, and TCM busy events	The behavior is the same when: - O_Called_Party events are armed in multiple call halves as part of METT in OCM. - The originator is subscribed to the O_Called_Party_Busy trigger. - The terminator is subscribed to the T_Busy trigger and/or a T_Busy event is armed. Busy event detection propagates in the backward direction.
Error condition while processing an O_Called_Party_Busy event request	When an error occurs while the SSP processes O_Called_Party_Busy, the SSP closes all extended transactions immediately.
Network_Busy (EDP-R)	METT in OCM behavior, when multiple Network_Busy events are armed, is similar to O_Called_Party_Busy events when the SSP receives an Analyze_Route message in response to a Network_Busy event request.

Table 129 Call scenarios (Continued)

Event scenario	Behavior (See call scenarios that follow this table.)
O_Answer (EDP-N)	O_Answer is an event that is detected in the backward direction. Upon detection of the O_Answer event, when multiple O_Answer event notifications are armed by METT in OCM, the SSP notifies the SCP from newer to older extended transactions.
When multiple individual events of different types are armed	Behavior of O_No_Answer: When the SCP arms the O_No_Answer event in the newer transaction and when the SSP arms either an O_Called_Party_Busy or a Network_Busy event in an older transaction, then: - when either an O_Called_Party_Busy or a Nework_Busy event gets detected, the SSP closes the O_No_Answer event immediately with closeCause:callTerminated, before processing O_Called_Party_Busy or Network_Busy. - when an O_No_Answer event is armed in the older transaction and when either an O_Called_Party_Busy or a Network_Busy event is armed in a newer transaction, then O_No_Answer event processing depends on the processing of newer transaction O_Called_Party_Busy or Network_Busy.

Table 129 Call scenarios (Continued)

Event scenario	Behavior (See call scenarios that follow this table.)
When multiple individual events of different types are armed (cont'd)	Behavior of O_Called_Party_Busy: When the O_Called_Party_Busy event is armed in the newer transaction and when either an O_No_Answer or a Network_Busy event is armed in an older transaction, then: - when either an O_No_Answer or a Network_Busy event gets detected, the routing attempt of the older transaction O_No_Answer or Network_Busy closes the O_Called_Party_Busy event. The close message provided is closeCause:callTerminated. When older transaction O_No_Answer receives a Continue response from the SCP (that is, the newer transaction O_CPB event is not taken down), the O_CPB event closes when either the terminator answers with a closeCause: calledPartyAnswered or, depending on the outcome, whether or not the terminator is subscribed to any switch based features. When the older transaction is Network_Busy (Network_Busy cannot receive a Continue response), the routing attempt of the older transaction Network_Busy takes down the newer transaction O_CPB event. When the SCP arms the O_Called_Party_Busy event in an older transaction and when either an O_No_Answer or a Network_Busy event is armed in a newer transaction, then: O_CPB event processing depends on the processing of newer transaction O_No_Answer or Network_Busy.

Table 129 Call scenarios (Continued)

Event scenario	Behavior (See call scenarios that follow this table.)
When multiple individual events of different types are armed (cont'd)	Behavior of Network_Busy: When a Network_Busy event is armed in the newer transaction and when either an O_Called_Party_Busy or an O_No_Answer event is armed in an older transaction, then: - when either an O_Called_Party_Busy or an O_No_Answer event gets detected, the SSP closes the Network_Busy event immediately with closeCause:callTerminated, before processing O_Called_Party_Busy or O_No_Answer. - when a Network_Busy event is armed in the older transaction and when either an O_Called_Party_Busy or an O_No_Answer event is armed in newer transaction, then: Network_Busy event processing depends on the processing of newer transaction O_Called_Party_Busy or O_No_Answer.

8.10.2 Call Scenarios

The following call scenarios describe, in general, METT in OCM functionality.

Note: Many combinations of METT in OCM scenarios are possible.

The following generic steps describe how to process and arm NELs or events:

1. Events are armed in response messages. During call processing, the first RRBCME message with a request for a NEL is in response to a trigger request message. Subsequent message requests for NELs can occur from a response to a trigger request message or an event request message through serial triggering.
2. In the following scenarios, the SSP creates multiple NELs for each OCM call half; events are armed through serial triggering. The SDS trigger arms the events as part of METT in OCM. The same behavior can occur through other serial triggering requests. An example of arming an event follows:
    a. Party A dials Party B and encounters an SDS trigger at the SSP. The Info_Analyzed query message goes to the SCP. The SSP receives an Analyze_Route and an RRBCME message in response to an Info_Analyzed query, arming an Nth event NELN. NELN can be any or all of the following events: O_No_Answer with a timer value TN,

O_Called_Party_Busy, Network_Busy, and O_Answer notification. The Analyze_Route message sets the CalledPartyID parameter to Party C. Party C can be another SDS trigger number.

Note: N is limited by the maximum number of serial triggers.

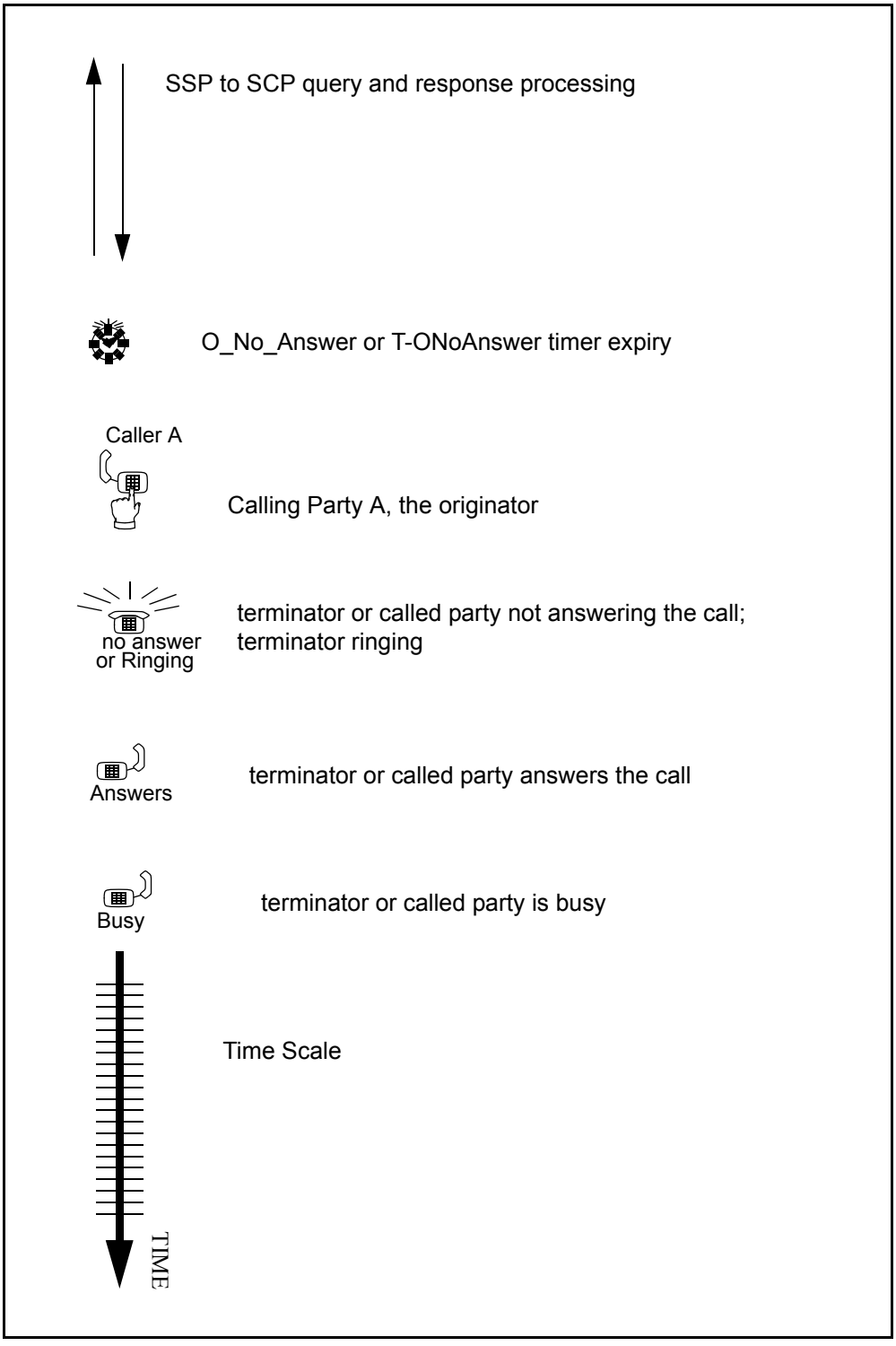
Please refer to Figure 40 on page 413 for a legend relating to the following call scenarios. The following rules of thumb also apply:

- In many of the examples, the four NELs for each call half are armed for better understanding and are not a limitation of METT in OCM.
- The example scenarios describe the functionality or processing of METT in OCM, and not the final outcome of the call. The examples do not provide call processing after METT in OCM (for example, the call can be answered, can time-out, or can be abandoned when METT in OCM processing completes.
- The functionality is broken down into steps to isolate the individual transactions that are independent of each other.
- The TIME scale provides a break down of sequence of event detection and processing involving the O_No_Answer event. The TIME scale does not reflect the functionality in real-time perspective.
- For better understanding, when describing METT in OCM functionality involving more than one call leg per call, only two call halves are considered. Call halves can be created due to switch-based or AIN-based redirection. When more than two call halves occur, functionality remains the same.
- When describing the functionality in the following example, an SDS trigger and an Analyze_Route response message arms the NELs in METT in OCM. METT in OCM functionality remains the same for other triggers and responses.
- When an Analyze_Route message is received in response to an older transaction event request, all newer transaction events are disarmed,

and CLOSE messages go to the SCP with closeCause:callTerminated.

- When an Analyze_Route message is received in response to a newer transaction event request, the SSP can still detect older transaction events (when appropriate conditions match).
- When a Continue message is received in response to a newer transaction event request, the call continues.

Figure 40 Legends used in diagrams



8.10.2.1 Example 1

The following example and figure describe how an event was armed in the OCM before the NA013 product release.

In the following example, ‘NEL’ refers to the O_No_Answer event.

Before the NA013 product release:

1. The SCP requested the SSP to arm the first NEL in an RRBCME message.
2. The SCP requested the SSP to arm the second NEL in an RRBCME message in a serial transaction. The older NEL remained open in the same call half.
3. The SSP did not arm the second NEL included in the RRBCME message of step 2. The SSP sent a CLOSE message to the SCP.
4. The SSP routed the call according to the CalledPartyID in step 2. The SSP started the T-ONoAnswer timer. Called Party D rang.
5. The T-ONoAnswer timer expired.
6. The SSP detected O_No_Answer event NEL1 and the appropriate EDP-R message went to the SCP.
7. The SSP received an Analyze_Route message in response to the EDP-R, and set parameter CalledPartyID to Party E. The call forwarded to Party E. Party D stoped ringing and disconnected from the call. Party E rang.

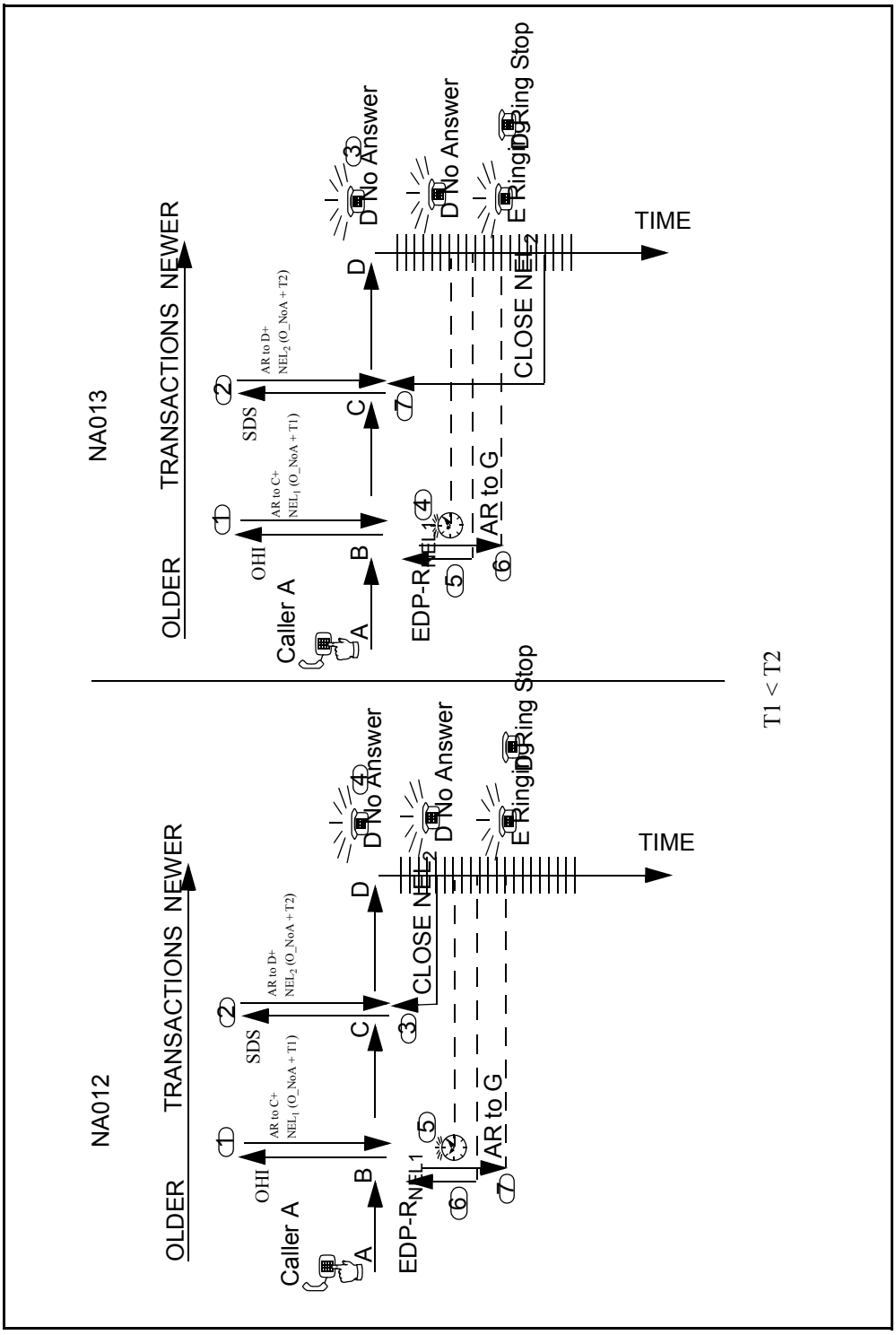
The following example and figure describe how an event is armed in the OCM for the NA013 product release.

NA013 behavior:

1. The SCP requests the SSP to arm the first NEL in an RRBCME message.
2. The SCP requests the SSP to arm the second NEL in an RRBCME message through a serial transaction. The older NEL remains open in the same call half.
3. The SSP routes the call according to the CalledPartyID in step 2. The SSP starts the T-ONoAnswer timers for NEL1 and NEL2. Called Party D rings.
4. The T-ONoAnswer timer expires.
5. The SSP detects O_No_Answer event NEL1 and builds the appropriate EDP-R message that goes to the SCP.

6. The SSP receives an Analyze_Route message in response to the EDP-R, and sets parameter CalledPartyID to Party E. The call forwards to Party E. Party D stops ringing and disconnects from the call. Party E rings.
7. The SSP cancels the active T-ONoAnswer timer for NEL2. The call cuts through the connection to Party E as in step 6. The SSP sends a CLOSE message to the SCP for extended transaction NEL2.

Figure 41 METT in OCM functionality in NA013



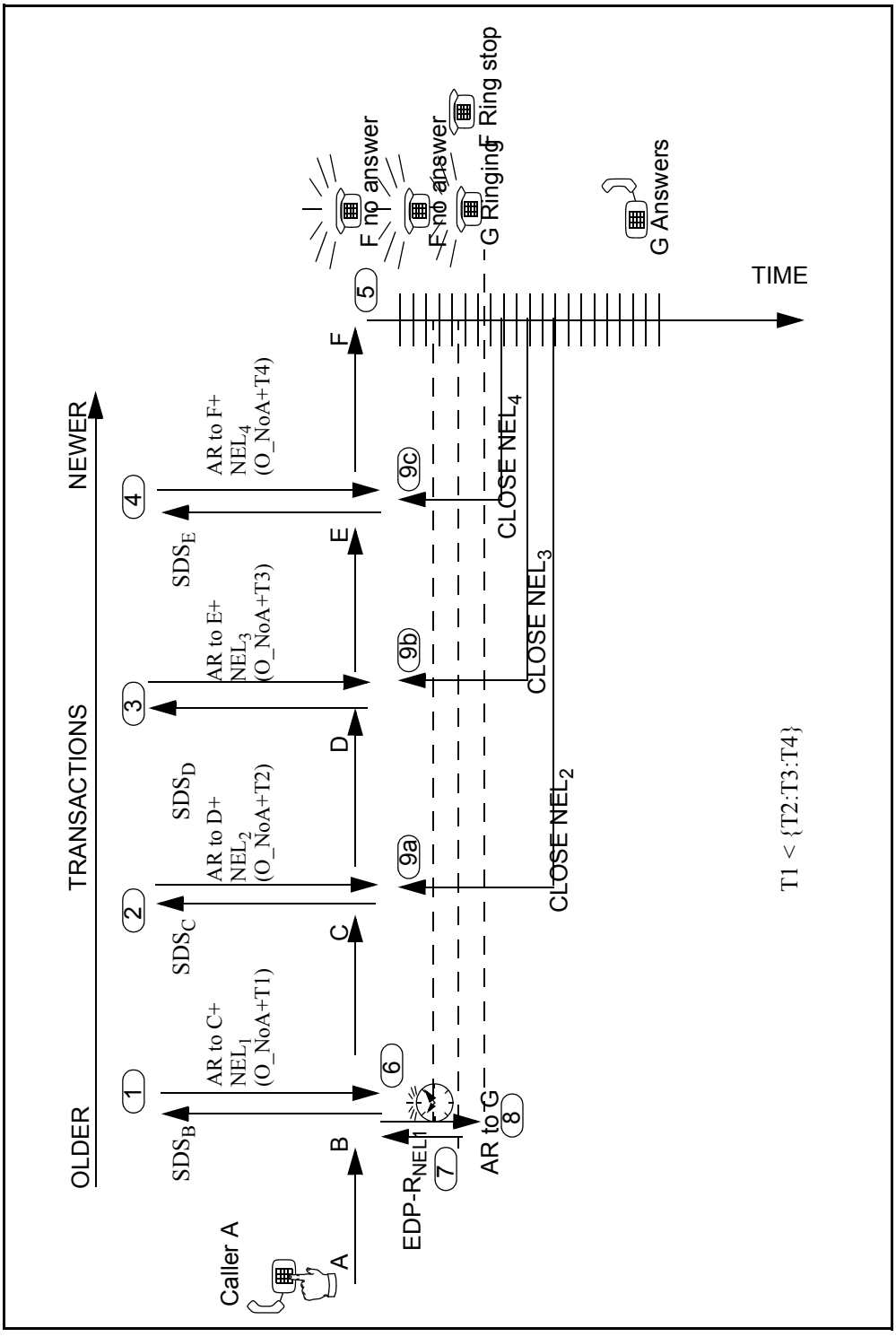
8.10.2.2 Example 2

The following example and figure describe METT in OCM behavior when the SCP requests multiple O_No_Answer events. The older transaction cancels newer transaction O_No_Answer timers and closes all newer transaction events.

In the following example, 'NEL' refers to the O_No_Answer event.

1. The SCP requests the SSP to arm the first NEL in an RRBCME message.
2. The SCP requests the SSP to arm the second NEL in an RRBCME message through a serial transaction. The older NEL remains open in the same call half.
3. The SCP requests the SSP to arm the third NEL in an RRBCME message through a serial transaction. The older NEL remains open in the same call half.
4. The SCP requests the SSP to arm the fourth NEL in an RRBCME message through a serial transaction. The older NEL remains open in the same call half.
5. The call is offered to Party F simultaneously. O_No_Answer timers T1, T2, T3, and T4 of all O_No_Answer events start. Party F rings.
6. Timer T1 expires for O_No_Answer event NEL1.
7. The SSP detects NEL1 and builds an appropriate message that goes to the SCP.
8. The SCP responds with a Analyze_Route message to the NEL1 EDP request, and sets the CalledPartyID as Party G. The Analyze_Route message processes and the call is offered to Party G. Party G rings. Party F disconnects from the call and stops ringing.
9. Timers T-ONoAnswer trigger timer, T2, T3, and T4 are cancelled and a CLOSE message goes to the SCP that disarms NEL4, NEL3, and NEL2 when the call is offered to Party G (even though the timers continue to run and do not expire).

Figure 42 Multiple O_NoA events with older transaction cancelling newer transaction



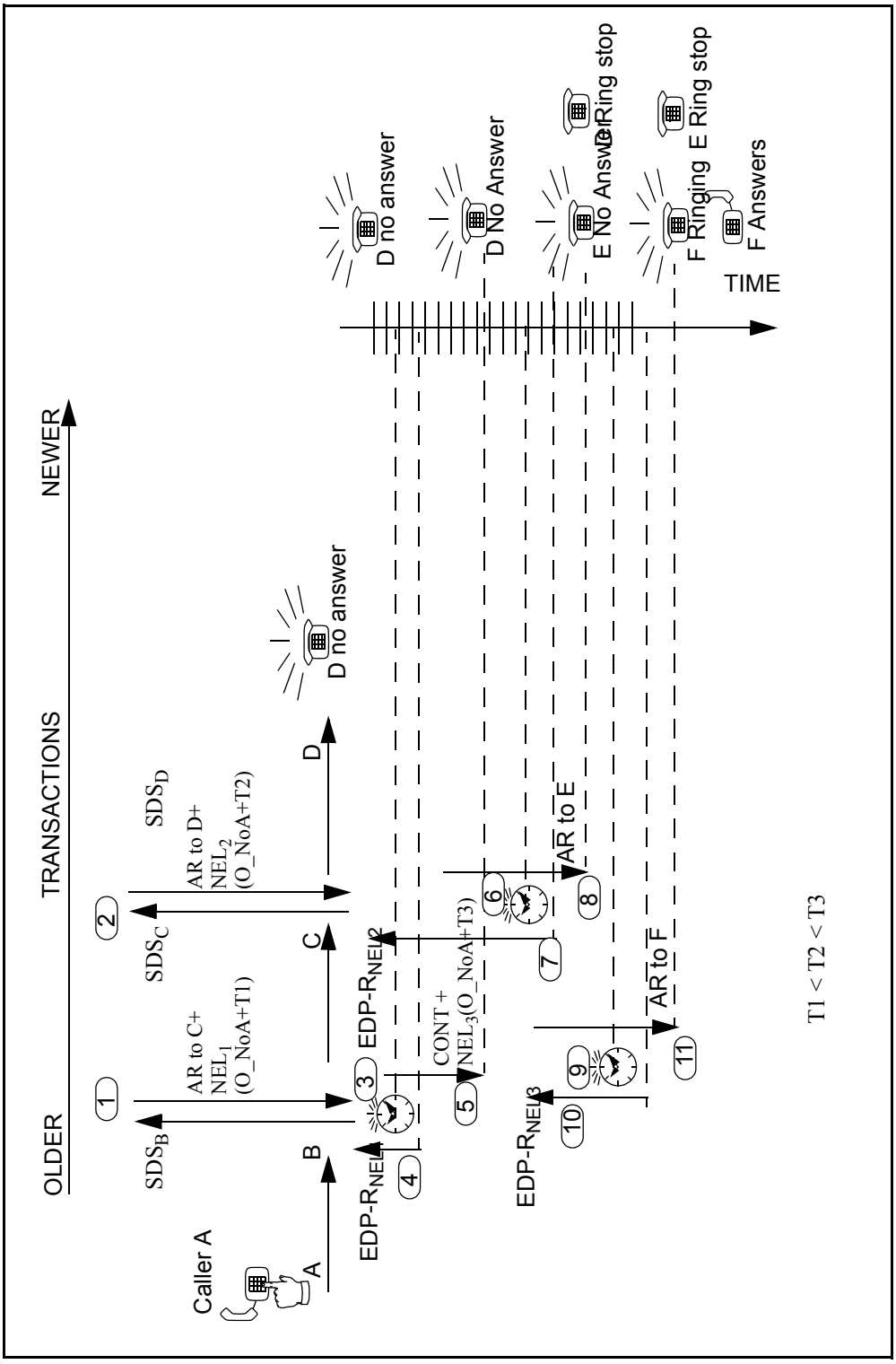
8.10.2.3 Example 3

The following example and figure describe METT in OCM behavior when a newer than the newest O_No_Answer event is armed in response to an older O_No_Answer EDP request. The newer than the newest O_No_Answer event is considered part of the same transaction as the processing older O_No_Answer event.

In the following example, 'NEL' refers to the O_No_Answer event.

1. The SCP requests the SSP to arm the first NEL in an RRBCME message.
2. The SCP requests the SSP to arm the second NEL in an RRBCME message through a serial transaction. The older NEL remains open in the same call half.
3. The call is offered to Party D. Party D rings. The O_No_Answer timer for event NEL1 expires.
4. The SSP builds an O_No_Answer event request message that goes to the SCP.
5. The SCP responds with a Continue message and another Request_Report_BCM_Event message, arming third O_No_Answer NEL3 with a timer value of T3. Party D does not answer and continues ringing. O_No_Answer timer T2 continues to run.
6. The O_No_Answer timer for event NEL2 expires.
7. The SSP builds an O_No_Answer event request message that goes to the SCP.
8. The SCP responds with an Analyze_Route message for the O_No_Answer event request for NEL2. The SCP sets the CalledPartyID as Party E. The Analyze_Route message processes and the SSP offers the call to Party E. Party D disconnects from the call and stops ringing. Party E rings. Timer T3 starts.
9. Party E does not answer. The O_No_Answer timer of event NEL3 expires.
10. The SSP builds an O_No_Answer event request message that goes to the SCP.
11. The SCP responds with an Analyze_Route message for the O_No_Answer event request for NEL3. The SCP sets the CalledPartyID as Party F. The Analyze_Route message processes and the call is offered to Party F. Party E disconnects from the call and stops ringing. Party F rings.

Figure 43 Multiple O_NoA events with O_NoA EDP-R arming an event



8.10.2.4 Example 4

The following example and figure describe the behavior of METT in OCM when the SSP arms multiple O_Called_Party_Busy events. This scenario is an example of backward direction EDP precedence. The same behavior can occur when the SSP receives a Continue response for an OCPB EDP-R.

Note: METT in OCM behavior is the same as when the SSP arms multiple Network_Busy events. A Continue response is not a valid response to a Network_Busy event request.

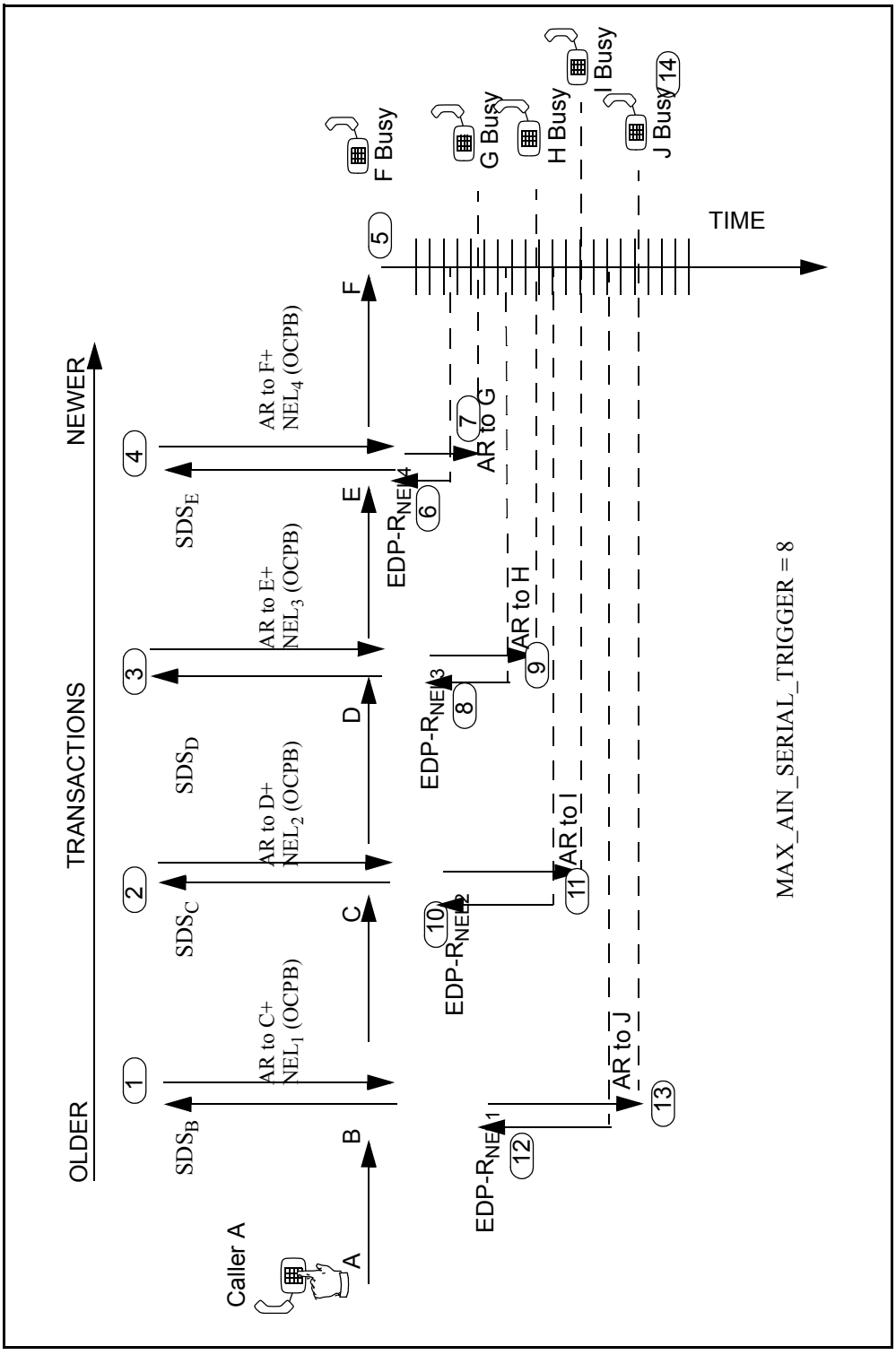
In the following example, 'NEL' refers to an OCPB event.

1. The SCP requests the SSP to arm the first NEL in an RRBCME message.
2. The SCP requests the SSP to arm the second NEL in an RRBCME message through a serial transaction. The older NEL remains open in the same call half.
3. The SCP requests the SSP to arm the third NEL in an RRBCME message through a serial transaction. The older NELs remain open in the same call half.
4. The SCP requests the SSP to arm the fourth NEL in an RRBCME message through a serial transaction. The older NELs remain open in the same call half.
5. The call is offered to Party F. Party F is busy. Busy treatment does not play back to the called party.
6. The SSP detects the Busy event in the backward direction (that is, newer transactions arming the O_Called_Party_Busy event see the busy event first). The SSP detects event NEL4 and builds an appropriate message that goes to the SCP.
7. The SCP responds with a Analyze_Route in response to the O_Called_Party_Busy event NEL4 EDP request. The SCP sets the CalledPartyID as Party G.
8. The Analyze_Route response message processes. The call routes to Party G. Party F disconnects from the call. Because Party G is busy, the busy event traverses in the backward direction and the SSP detects O_Called_Party_Busy event NEL3. The SSP builds an appropriate message that goes to the SCP.
9. The SCP responds with a Analyze_Route in response to the O_Called_Party_Busy event NEL3 EDP request. The SCP sets the CalledPartyID as Party H.
10. The Analyze_Route response message processes and the call routes to Party H. Party G disconnects from the call. Because Party H is busy, the busy event traverses in the backward direction. The SSP detects

O_Called_Party_Busy event NEL2 and builds an appropriate message that goes to the SCP.

11. The SCP responds with Analyze_Route in response to the O_Called_Party_Busy event NEL2 EDP request. The SCP sets the CalledPartyID as Party I.
12. Because Party I is busy, the busy event traverses in the backward direction and the SSP detects O_Called_Party_Busy event NEL1. The SSP builds an appropriate message and sends the message to the SCP.
13. The SCP responds with an Analyze_Route message in response to the O_Called_Party_Busy event NEL1 EDP request. The SCP sets the CalledPartyID as Party J.
14. The SSP applies a busy treatment to calling Party A after the SSP processes all O_Called_Party_Busy events.

Figure 44 OCPB events backward direction EDP precedence



8.10.2.5 Example 5

The following example and figure describe the behavior of METT in OCM when multiple NELs with different even request and event notification are armed.

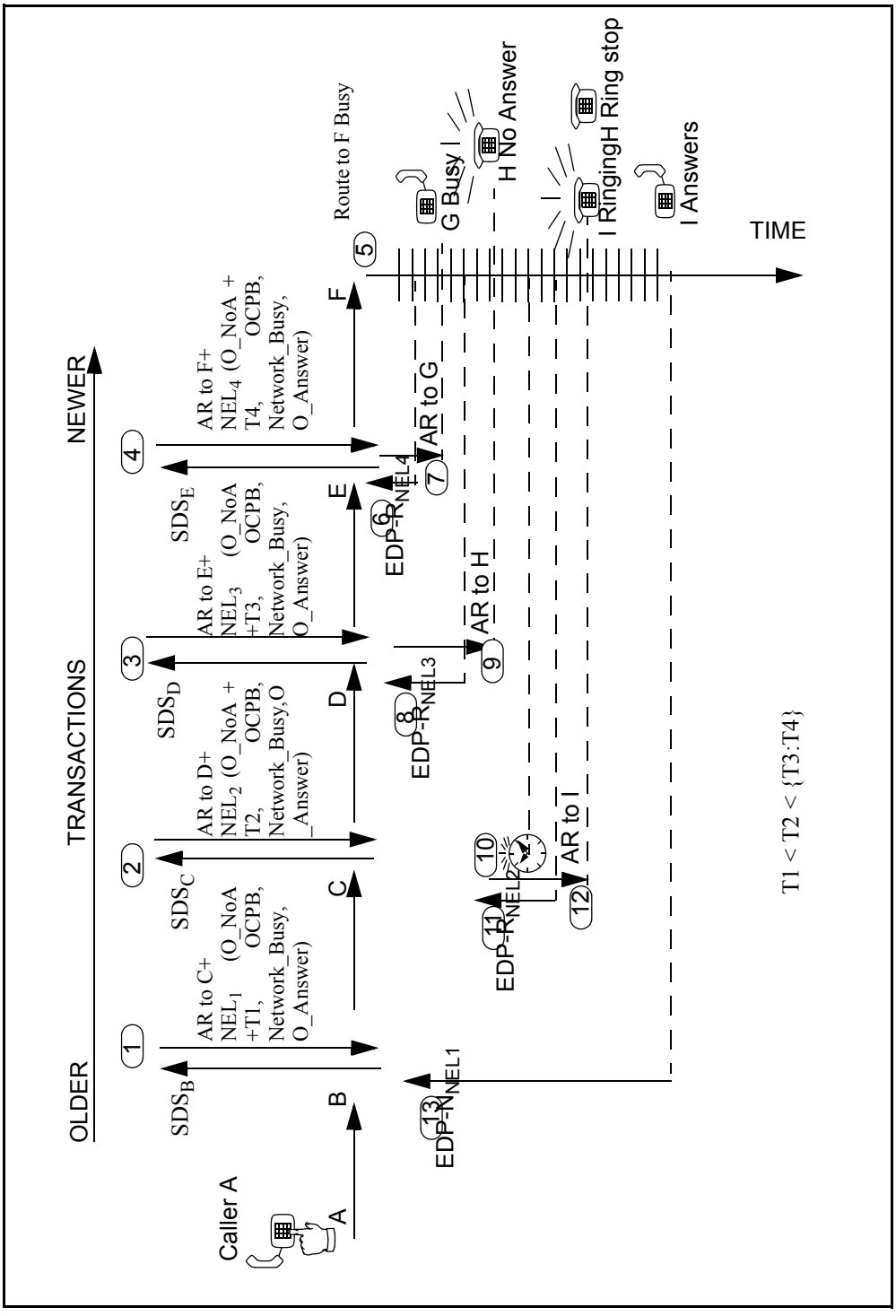
In the following example, 'NEL' refers to the OCPB, O_No_Answer, Network_Busy request event and O_Answer notification.

1. The SCP requests the SSP to arm the first NEL in an RRBCME message.
2. The SCP requests the SSP to arm the second NEL in an RRBCME message through a serial transaction. The older NEL remains open in the same call half.
3. The SCP requests the SSP to arm the third NEL in an RRBCME message through a serial transaction. The older NELs remain open in the same call half.
4. The SCP requests the SSP to arm the fourth NEL in an RRBCME message through a serial transaction. The older NELs remain open in the same call half.
5. The call routes to Party F. Party F is busy.
6. The SSP detects the Network_Busy event in the backward direction, (that is, the newer transactions arming the Network_Busy event see the busy event first). The SSP detects event NEL4 for Network_Busy. The SSP builds an appropriate message that goes to the SCP.
7. The SCP responds with an Analyze_Route in response to the Network_Busy event NEL4 EDP request, setting the CalledPartyID as Party G.
8. The Analyze_Route message processes and the call is offered to Party G. Party G is busy. Because Party G is busy, the busy event traverses in the backward direction. The SSP detects event O_Called_Party_Busy NEL3 and builds an appropriate message that goes to the SCP.
9. The SCP responds with an Analyze_Route in response to the O_Called_Party_Busy event NEL3 EDP request, setting the CalledPartyID as Party H. The SSP offers the call to Party H and, simultaneously, O_No_Answer timers T1 and T2 of the O_No_Answer events start. Party H rings but does not answer.
10. Timer T2 expires for O_No_Answer event NEL2.
11. The SSP detects NEL2 and builds an appropriate message that goes to the SCP while Party H rings.
12. The SCP responds with an Analyze_Route message in response to the NEL2 EDP request, and sets the CalledPartyID as Party I. The Analyze_Route message processes and the call is offered to Party I. Party

I starts ringing. Party H disconnects from the call and stops ringing. O_No_Answer event timer T1 continues to run and does not expire.

13. Party I answers the call before O_No_Answer event timer T1 expires. The SSP builds an EDP notification message for O_Answer notification event NEL1. The SSP sends the notification message to the SCP.

Figure 45 METT in OCM with O_Answer, OCPB, O_NoA, Network_Busy



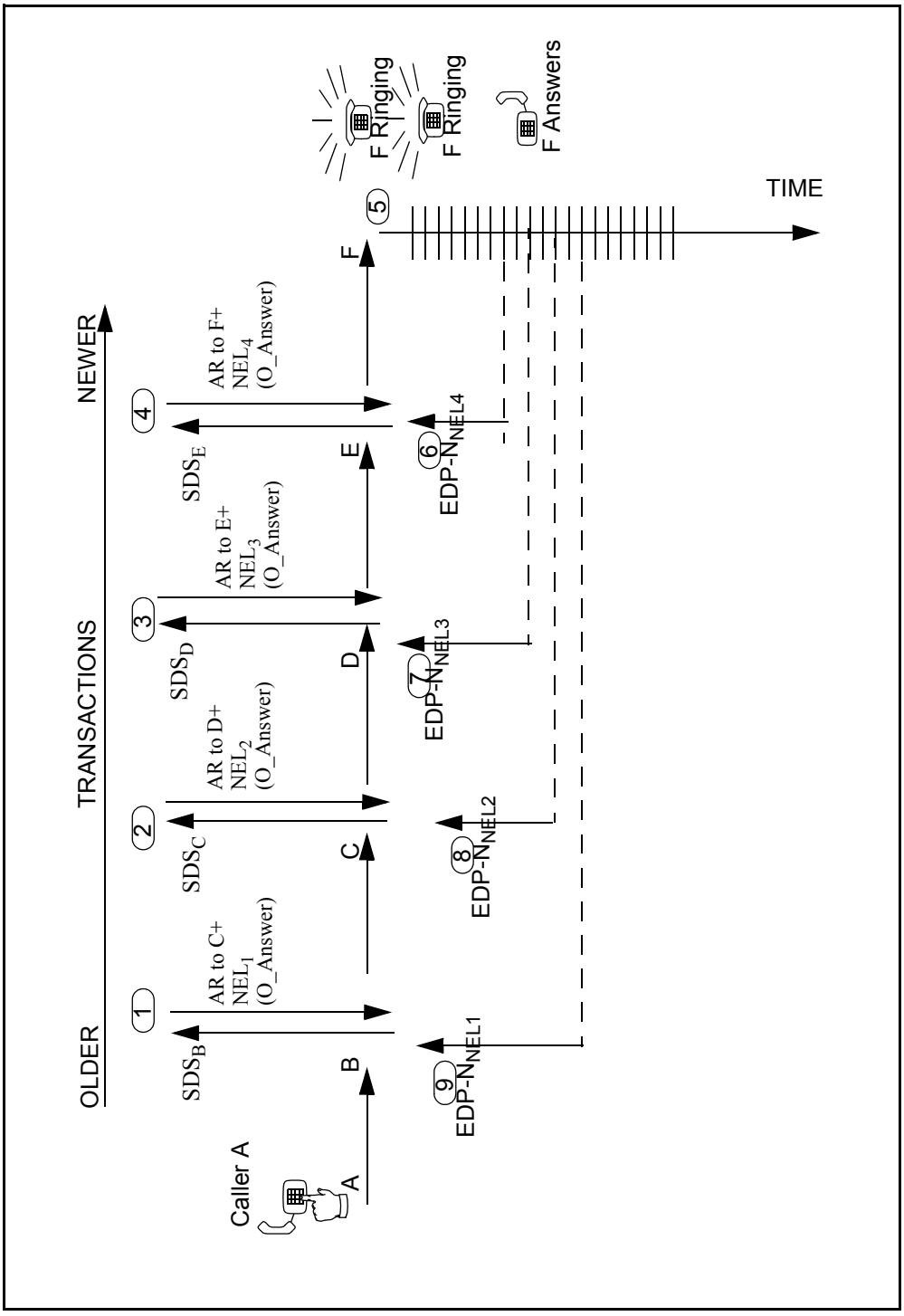
8.10.2.6 Example 6

The following example and figure describe the behavior of METT in OCM when multiple O_Answer notification events are armed.

In the following example 'NEL' refers to O_Answer notification.

1. The SCP requests the SSP to arm the first NEL in an RRBCME message.
2. The SCP requests the SSP to arm the second NEL in an RRBCME message through a serial transaction. The older NEL remains open in the same call half.
3. The SCP requests the SSP to arm the third NEL in an RRBCME message through a serial transaction. The older NELs remain open in the same call half.
4. The SCP requests the SSP to arm the fourth NEL in an RRBCME message through a serial transaction. The older NELs remain open in the same call half.
5. The SSP offers the call to Party F. Party F rings.
6. Party F answers the call. The SSP builds an EDP notification message for O_Answer notification events NEL4, NEL3, NEL2, and NEL1 and sends the messages to the SCP sequentially, from newer to older transaction.

Figure 46 METT in OCM with multiple O_Answer event notification



8.10.2.7 Example 7

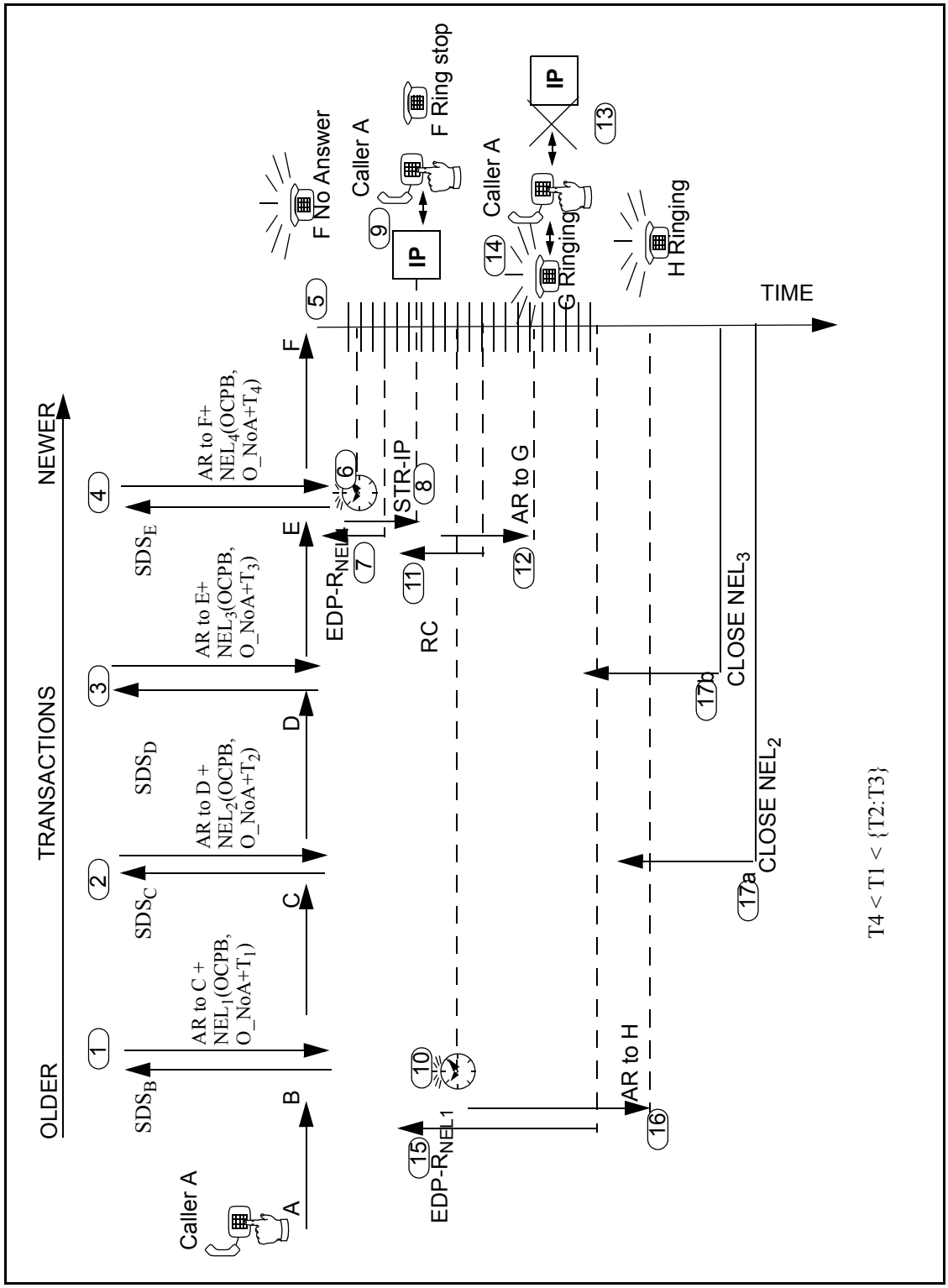
The following example and figure describe the behavior of METT in OCM when multiple O_No_Answer events are armed and when the SSP receives STR to IP in response to an O_No_Answer event request.

In the following example, 'NEL' refers to O_No_Answer event.

1. The SCP requests the SSP to arm the first NEL in an RRBCME message.
2. The SCP requests the SSP to arm the second NEL in an RRBCME message through a serial transaction. The older NEL remains open in the same call half.
3. The SCP requests the SSP to arm the third NEL in an RRBCME message through a serial transaction. The older NELs remain open in the same call half.
4. The SCP requests the SSP to arm the fourth NEL in an RRBCME message through a serial transaction. The older NELs remain open in the same call half.
5. The SSP offers the call to Party F. Simultaneously, O_No_Answer timers T1 T2 T3 and T4 of all O_No_Answer events start. Party F rings.
6. The timer for O_No_Answer event NEL4 expires.
7. The SSP detects NEL4 and builds an appropriate message that goes to the SCP.
8. The SCP responds with a Send_To_Resource to IP for O_No_Answer event NEL4.
9. The Send_To_Resource connects Calling Party A to an IP. Party F disconnects from the call and stops ringing. The IP plays an announcement to calling Party A.
10. The T1 timer for O_No_Answer event NEL1 expires. Calling Party A connects to the IP and listens to the announcement for digit collection. Expired O_No_Answer event NEL1 does not process until STR-IP processing completes.
11. Party A dials the digits. The SSP sends a Resource_Clear message to the SCP, after collecting the digits from the calling party.
12. The SSP receives an Analyze_Route message in response to the original EDP-R message sent in step 7. The CalledPartyID is set to Party G in the Analyze_Route message.
13. The SSP disconnects the IP connection from calling Party A.
14. Calling Party A connects to Party G.
15. The SSP processes already expired event NEL1 and builds an appropriate message that goes to the SCP.

16. The SCP responds with a Analyze_Route message to the NEL1 EDP request, and also sets the CalledPartyID as Party H. The Analyze_Route message processes and the call is offered to Party H. Party H starts ringing. Party G stops ringing. Timers T2 and T3 continue to run and do not expire.
17. The SSP cancels timers T2 and T3 and disarms NEL2 and NEL3. A CLOSE message for events NEL2 and NEL3 goes to the SCP.

Figure 47 METT in OCM with multiple O_NoA and STR-IP response to EDP-R



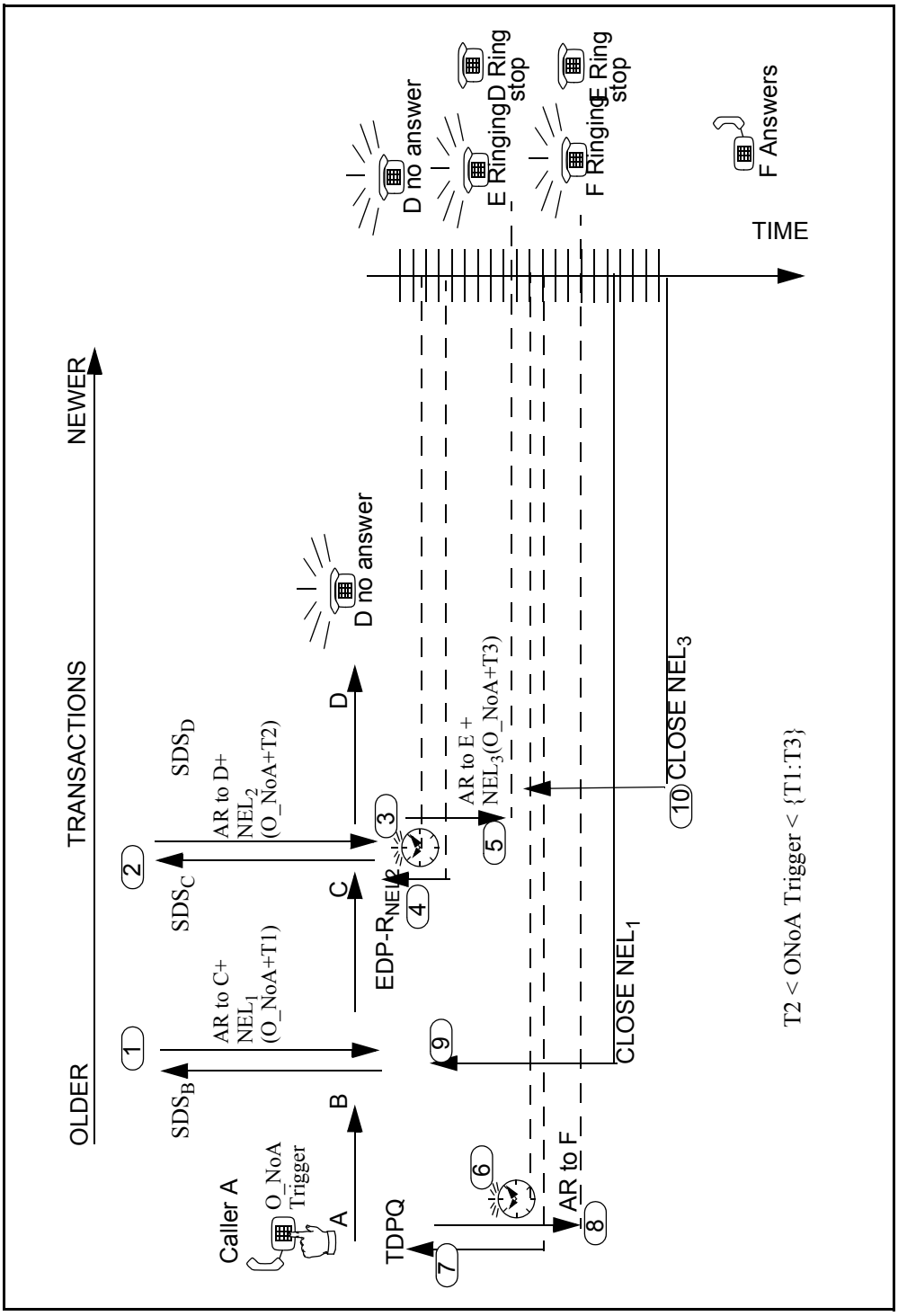
8.10.2.8 Example 8

The following example and figure describe the behavior of METT in OCM while interacting with trigger O_No_Answer, subscribed by the originator.

In the following example, 'NEL' refers to the O_No_Answer event.

1. Party A is subscribed to the O_No_Answer trigger. The SCP requests the SSP to arm the first NEL in an RRBCME message.
2. The SCP requests the SSP to arm the second NEL in an RRBCME message through a serial transaction. The older NEL remains open in the same call half.
3. The call is offered to Party D. Party D rings. The O_No_Answer trigger timer and O_No_Answer event timers T1 and T2 start simultaneously. The O_No_Answer timer for NEL2 event expires.
4. The SSP builds an O_No_Answer event request message and sends the message to the SCP.
5. The SCP responds with an Analyze_Route message with CalledPartyID as Party E. The SCP arms another RRBCME message, O_No_Answer NEL3 with a timer value of T3. The SSP offers the call to Party E. Party E rings. Party D disconnects and stops ringing.
6. The T-ONoAnswer trigger timer expires before Party E answers the call.
7. The SSP builds an O_No_Answer trigger query message and sends the message to the SCP.
8. The SCP responds with an Analyze_Route message for the O_No_Answer trigger query on Party A. The SCP sets the CalledPartyID as Party F. The Analyze_Route message processes. The SSP offers the call to Party F. Party E disconnects from the call and stops ringing. Party F rings.
9. When the call is offered to Party F, the SSP sends a CLOSE message to disarm O_No_Answer events NEL1 and NEL3.

Figure 48 METT in OCM with multiple O_NoA events interaction with O_NoA trigger



8.10.2.9 Example 9

The following example and figure describe the behavior of METT in OCM while interacting with triggers O_No_Answer and T_No_Answer, and TCM events.

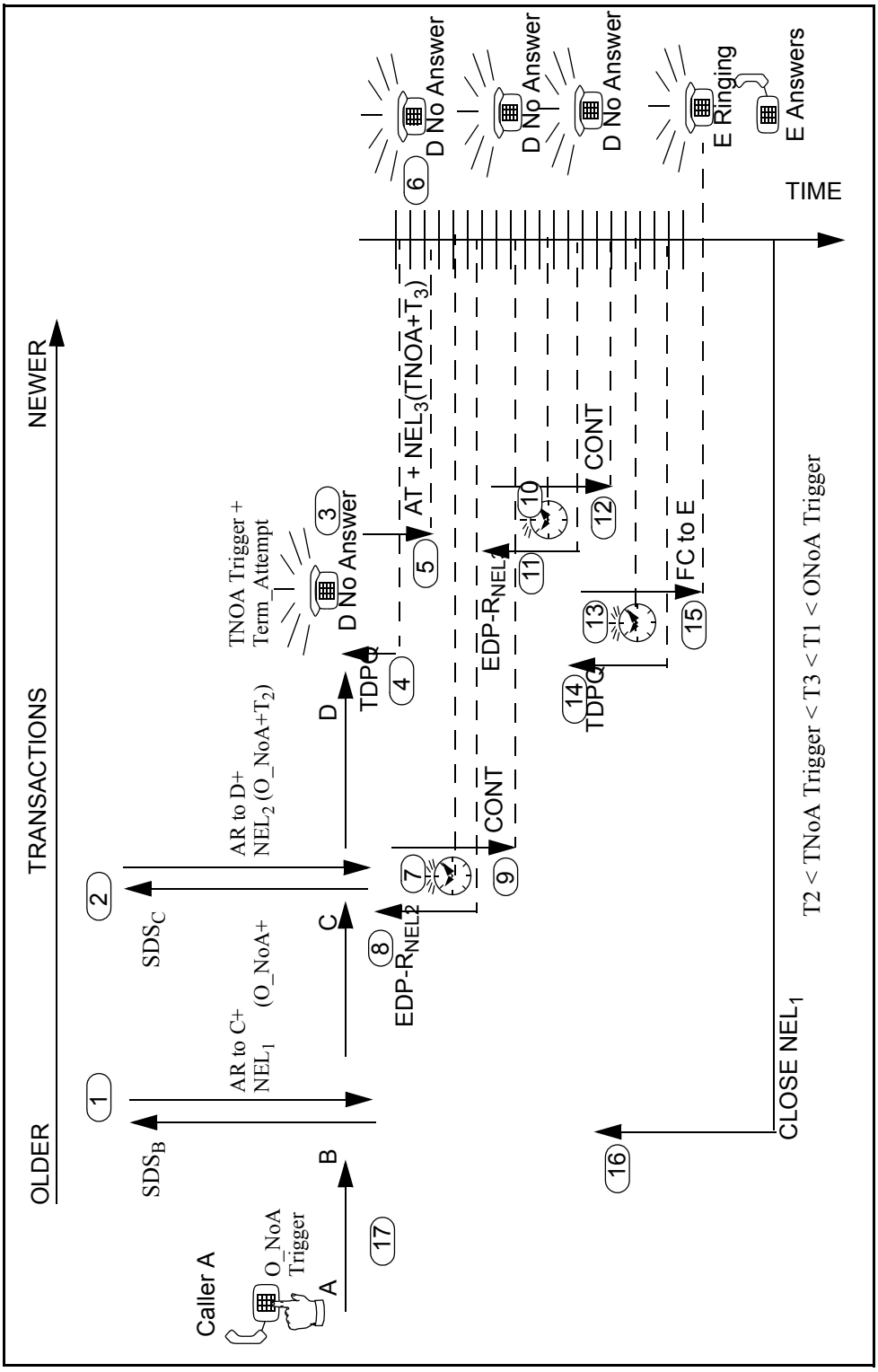
In the following example, 'NEL' refers to the O_No_Answer event.

1. Party A is subscribed to trigger O_No_Answer. The SCP requests the SSP to arm the first NEL in an RRBCME message.
2. The SCP requests the SSP to arm the second NEL in an RRBCME message through a serial transaction. The older NEL remains open in the same call half.
3. Party D is subscribed to triggers Termination_Attempt and T_No_Answer.
4. The SSP builds a Termination_Attempt trigger query message and sends the message to the SCP because Party D is subscribed to trigger Termination_Attempt.
5. The SCP responds with an Authorize_Termination and a Request_Report_BCM_Event message, and arms NEL3 TCM event T_No_Answer with timer T3.
6. When the SSP offers the call to Party D and Party D rings, Authorize_Termination terminates the call on Party D. Party D rings and does not answer the call. Timers T-ONoAnswer, T1, T2 and T_No_Answer event NEL3 timer T3 start simultaneously. When the call is offered to Party D, Party D rings. Timer T-T_No_Answer of the trigger T_No_Answer subscribed by terminating Party D does not start until T_No_Answer event NEL3 processes. Precedence occurs between the T_No_Answer trigger and event. The T_No_Answer event processes first.
7. Timer T2 expires for O_No_Answer Events NEL2.
8. The SSP detects NEL2 and builds an appropriate message that goes to the SCP.
9. The SCP responds with a Continue response for O_No_Answer event NEL2. Timers T-ONoAnswer and T1, and T_No_Answer event NEL3 timer T3 continue to run and do not expire. Timer T-T_No_Answer of the T_No_Answer trigger subscribed by terminating Party D does not start until T_No_Answer event NEL3 processes.
10. Timer T3 expires for T_No_Answer event NEL3.
11. The SSP detects NEL3 and builds an appropriate message that goes to the SCP.
12. The SCP responds with another Continue message for T_No_Answer event NEL3. Timers T-ONoAnswer and T1 continue to run and do not

expire. Timer T-T_No_Answer of the T_No_Answer trigger subscribed by terminating Party D starts because T_No_Answer event NEL3 processed. This happens only when a Continue response message is received for T_No_Answer event NEL3. Any other response closes the trigger T_No_Answer; a CLOSE message does not go to the SCP.

13. Timer T-T_No_Answer expires for trigger T_No_Answer on Party D. Timers T-ONoAnswer and T1 continue to run.
14. The SSP builds a query message for the T_No_Answer trigger and sends the message to the SCP.
15. The SCP responds with a Forward_Call message to the T_No_Answer query and sets the CalledPartyID as Party E. The Forward_Call message processes and the SSP offers the call to Party E. Party E rings. Party D disconnects from the call and stops ringing. Timers T-ONoAnswer and T1 continue to run and do not expire.
16. The SSP sends a CLOSE message to disarm NEL1 when Party E answers the call even though timer T1 continues to run and does not expire.
17. The SSP does not send a CLOSE message for the O_No_Answer trigger. Trigger O_No_Answer timer started when the call was offered to Party D and did not expire when Party E answered the call.

Figure 49 METT in OCM with multiple O_NoA events interaction with TCM events and triggers



8.10.2.10 Example 10

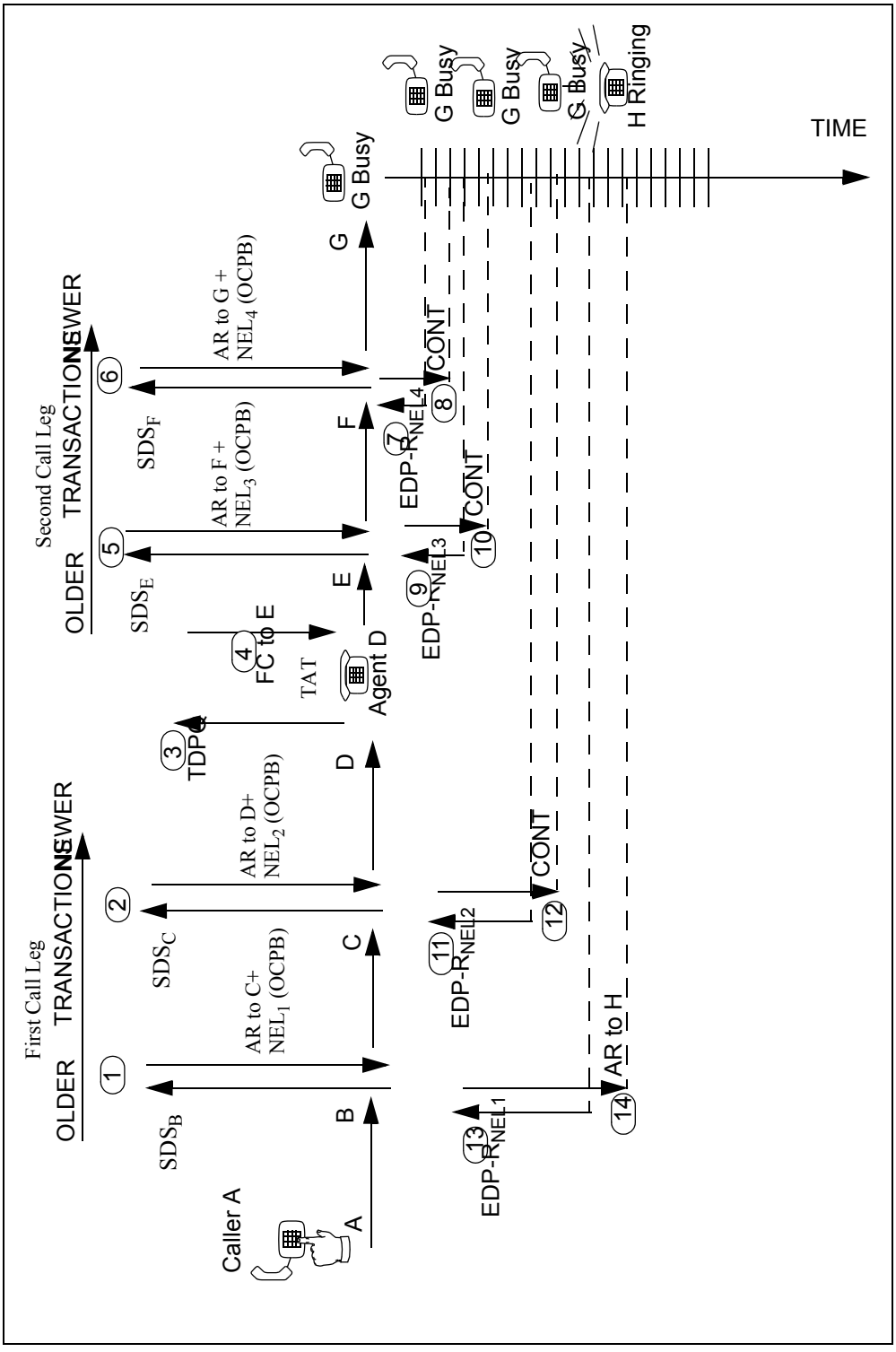
The following example and figure describe the behavior of METT in OCM when more than one call leg is present for the call. For better understanding, only two call legs are considered for each call. In this case, the second call leg is created when redirection occurs due to AIN. The functionality behaves similarly as when the redirection occurs due to the switch-based Call Forward feature, and any other features that cause a redirection.

In the following example, 'NEL' refers to the OCPB event.

1. The SCP requests the SSP to arm the first NEL in an RRBCME message.
2. The SCP requests the SSP to arm the second NEL in an RRBCME message through a serial transaction. The older NEL remains open in the same call half. The call routes to Party D.
3. Party D is subscribed to trigger Termination_Attempt. The SSP builds a Termination_Attempt trigger query message sends the message to the SCP.
4. The SCP responds with a Forward_Call message. The Forward_Call message sets parameter CalledPartyID as Party E. Party E is another SDS trigger number. The Forward_Call message takes the call into the second call leg.
5. In the second call leg, the call hits an SDS trigger at the SSP. The SCP requests the SSP to arm the first NEL in an RRBCME message in the second call leg, and a third NEL for the entire call.
6. The SCP requests the SSP to arm the second NEL in an RRBCME message in the second call leg, and a fourth NEL for the entire call, through a serial transaction. The older NEL remains open in the same call leg. The Analyze_Route sets the CalledPartyID as Party G. The Analyze_Route message offers the call to Party G. Party G is busy.
7. The O_Called_Party_Busy event NEL4 armed in the second call half sees the busy event first. The SSP builds an appropriate message for the NEL4 event request and sends the message to the SCP.
8. The SCP responds with a Continue message for the O_Called_Party_Busy event NEL4 request.
9. O_Called_Party_Busy event NEL3 armed in the second call half sees the event. The SSP builds an appropriate message for the NEL3 event request and sends the message to the SCP.
10. O_Called_Party_Busy event NEL3 armed in the second call half sees the busy event. The SSP builds an appropriate message for the NEL3 event request and sends the messages to the SCP.
11. The SCP responds with a Continue message in response to the O_Called_Party_Busy event NEL3 request.

12. O_Called_Party_Busy event NEL2 armed in the first call half sees the busy event. The SSP builds an appropriate message for the NEL2 event request and sends the message to the SCP.
13. The SCP responds with another Continue message.
14. O_Called_Party_Busy event NEL1 armed in the first call half sees the busy event. The SSP builds an appropriate message for the NEL1 event request and sends the message to the SCP.
15. The SCP responds with an Analyze_Route message in response to the O_Called_Party_Busy event NEL1 request. The SCP sets CalledPartyID as Party H. The Analyze_Route message processes and offers the call to Party H. Party G disconnects from the call. Party H rings.

Figure 50 METT in OCM in multiple call legs



8.10.2.11 Example 11

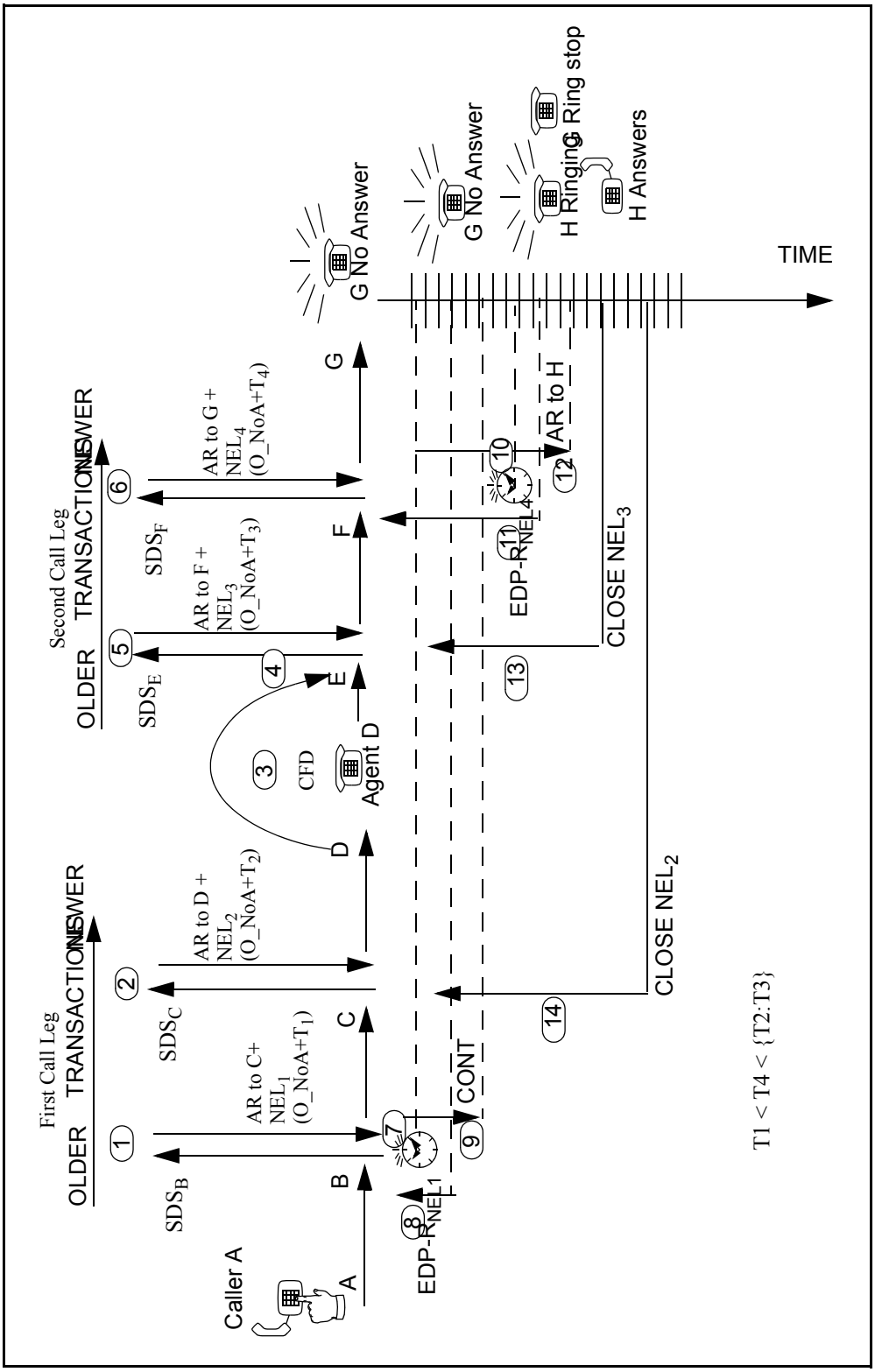
The following example and figure describe the behavior of METT in OCM when more than one call leg is present for each call. In this example, only two call legs are considered for each call; the second call leg is created when redirection occurs due to a switch-based feature.

In the following example, 'NEL' refers to an O_No_Answer event.

1. The SCP requests the SSP to arm the first NEL in an RRBCME message.
2. The SCP requests the SSP to arm the second NEL in an RRBCME message through a serial transaction. The older NEL remains open in the same call half. The Analyze_Route sets the CalledPartyID as Party D.
3. Party D has Call_Forward.
4. Party D forwards the call to Party E. Party E is an SDS trigger number. Because of the Call_Forward redirection on Party D, a second call leg occurs.
5. In the second call leg, the call hits an SDS trigger at the SSP. The SCP requests the SSP to arm the first NEL for the second call leg, and a third NEL for the entire call in an RRBCME message.
6. The SCP requests the SSP to arm the second NEL for the second call leg, and a fourth NEL for the entire call, in an RRBCME message through a serial transaction. The older NELs are open in the same call. The Analyze_Route sets the CalledPartyID as Party G. The Analyze_Route message offers the call to Party G. O_No_Answer timers T1, T2, T3, and T4 start. Party G rings.
7. The O_No_Answer timer for NEL1 T1 expires.
8. O_No_Answer event NEL1 armed in the first call half sends an event request to the SCP with the appropriate message.
9. The SCP responds with a Continue message for the O_No_Answer event NEL1 request.
10. While Party G rings and does not answer, the O_No_Answer event timer T4 for NEL4 expires. This timer was armed in the second call half.
11. The SSP builds the appropriate NEL4 event request message and sends the message to the SCP.
12. The SCP responds with a Analyze_Route message for O_No_Answer event request NEL4, and sets CalledPartyID as Party H. The Analyze_Route message processes; the call is offered to Party H. Party G disconnects from the call and stops ringing. Party H rings.
13. While the other O_No_Answer event timers run, timers T3 and T2 continue to run and do not expire. Party H answers the call. The SSP sends a CLOSE message to the SCP for extended transaction NEL3.

14. The SSP sends a CLOSE message to the SCP for extended transaction NEL2.
15. A speech path occurs between Party A and Party H.

Figure 51 METT in OCM in multiple call legs with switch-based redirection



8.11 O_Disconnect and O_Disconnect_Called events

This section describes the O_Disconnect and O_Disconnect_Called events.

8.11.1 Product View

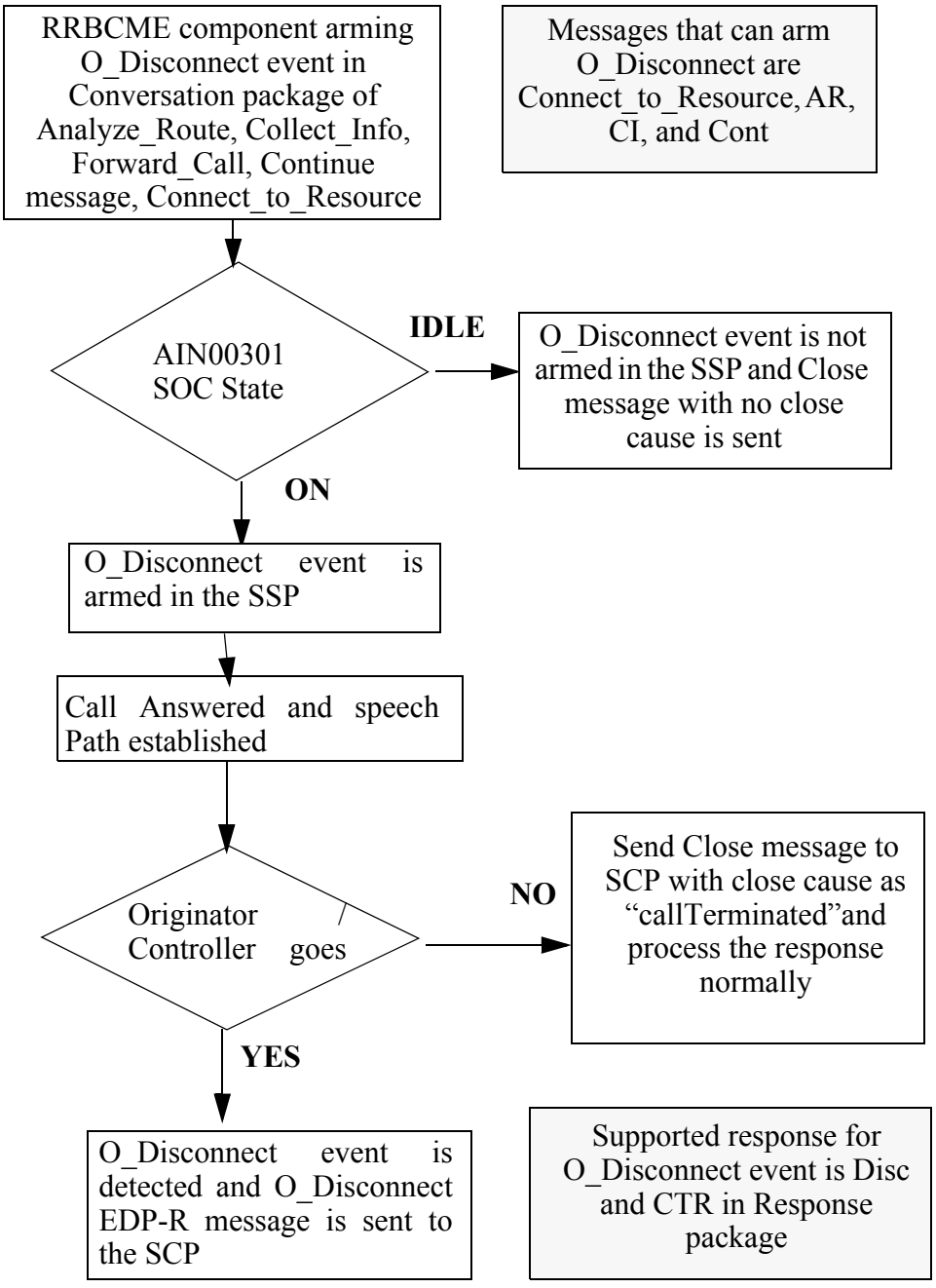
The O_Disconnect and O_Disconnect_Called events implement the O_Disconnect and O_Disconnect _Called event FS.

The O_Disconnect and O_Disconnect_Called events consist of the folowing functions:

- Arming O_Disconnect and/or O_Disconnect_Called events
- O_Disconnect and O_Disconnect_Called event detection and processing
- O_Disconnect EDP-R query message processing
- Response processing
- Post-Query message handling and Error handling

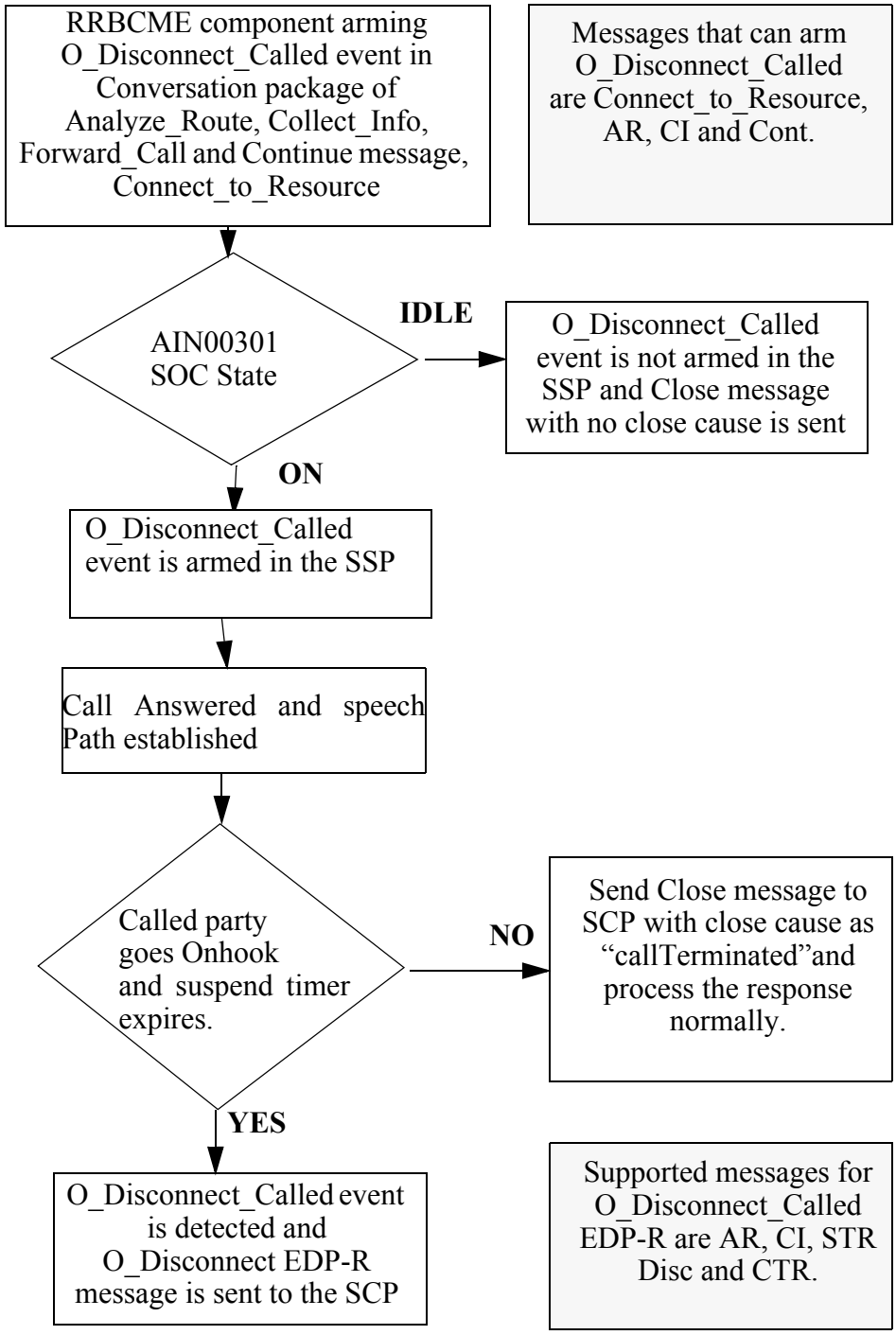
The functional behavior of the O_Disconnect event is shown in the following figure.

Figure 52 Functional Behavior Diagram O_Disconnect Event



The functional behavior of the O_Disconnect_Called event is shown in the following figure.

Figure 53 Functional Behavior Diagram of O_Disconnect_Called event



8.11.2 Arming the O_Disconnect and/or O_Disconnect_Called events

The O_Disconnect event can only be armed by the Originating agent in the RRBCME component of Analyze_Route, Collect_Info and Continue messages.

When subsequent redirecting agents attempt to arm the O_Disconnect event, the event is not succesfully armed and Close message with CloseCause ‘eDPsCompleted’ is returned to the SCP. When attempts are made to arm the O_Disconnect event in the RRBCME component of messages other than the Analyze_Route, Collect_Info and continue, the event is not armed and Close message without a CloseCause is returned to the SCP.

Arming of O_Disconnect is not supported for Merge_Call, Reconnect, Disconnect_Leg, Acknowledge, Originate_Call, Move_Leg, and Split_Leg by this activity.

The O_Disconnect_Called event is armed in the RRBCME component of Analyze_Route, Collect_Info, Forward_Call and Continue messages. When attempts are made to arm the O_Disconnect_Called event in the RRBCME component of messages other than Analyze_Route, Collect_Info, Forward_call Continue and Connect_to_Resource, the event is not armed and Close message without a CloseCause is returned to the SCP.

O_Disconnect and O_Disconnect_Called events are not detected in the case of user abandon.

If OCM METT SOC AIN00272 is ON, and if more than one O_Disconnect event is armed in the same call leg, then the first O_Disconnect event will be closed with a CloseCause of "EDPsCompleted". The other NEL will remain active. If OCM METT SOC AIN00272 is IDLE, then the first NEL will remain active while the second NEL will be closed with no CloseCause.

8.11.3 Detecting and Processing the O_Disconnect event

When the O_Disconnect event is armed and the Originating/Controlling party disconnects, the O_Disconnect event is detected and an O_Disconnect EDP-R query message is sent to SCP.

When the O_Disconnect_Called event is armed and the Terminator/Called party disconnects, the O_Disconnect_Called event is detected and an O_Disconnect EDP-R query message is sent to SCP. The O_Disconnect_Called event is in the backward direction. The notification of occurrence propagates from the terminating party to the originating party. When the SSP detects an armed O_Disconnect_Called event, it sends an EDP-R message to the SCP application involved in the newest open transaction that requested the event.

When multiple events are armed in the EDPRequest parameter of the same RRBCME component, only the first event is detected and reported to the SCP. The remaining events are not detected.

8.11.4 Response Processing for the O_Disconnect and O_Disconnect_Called events

When the SSP receives the SCP response, the response is decoded and the call is processed according to the instructions contained in the message.

Valid SCP response messages for a O_Disconnect Event are:

- Disconnect message (in all Call Configurations(CCs) in which O_Disconnect is applicable)
- Connect_To_Resource (in all CCs in which O_Disconnect_Called is applicable)

Valid SCP response messages for a O_Disconnect_Called Event are:

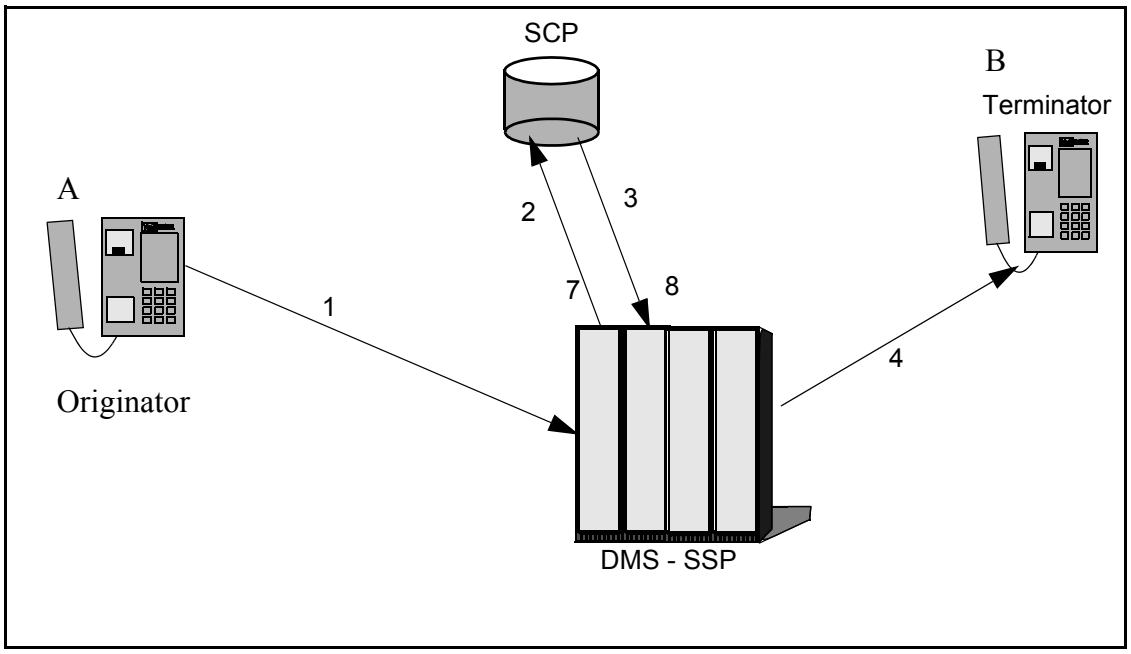
- Analyze_Route (in CC2 only)
- Collect_Information (in CC2 only)
- Send_To_Resource (in CC2 only)
- Disconnect (in all CCs in which O_Disconnect_Called is applicable)
- Connect_To_Resource (in all CCs in which O_Disconnect_Called is applicable)

Note: When a Connect_To_Resource, Disconnect_Leg, Merge_Call and When Analyze_route, Collect_info or Send_To_Resource message is received, the call is forwarded toward the terminator and the effective CC is CC1. Reconnect is an invalid response for this release.

8.11.5 Sample call for O_Disconnect event

The O-Disconnect event call flow is shown in the figure below.

Figure 54 Call Flow: O_Disconnect Event



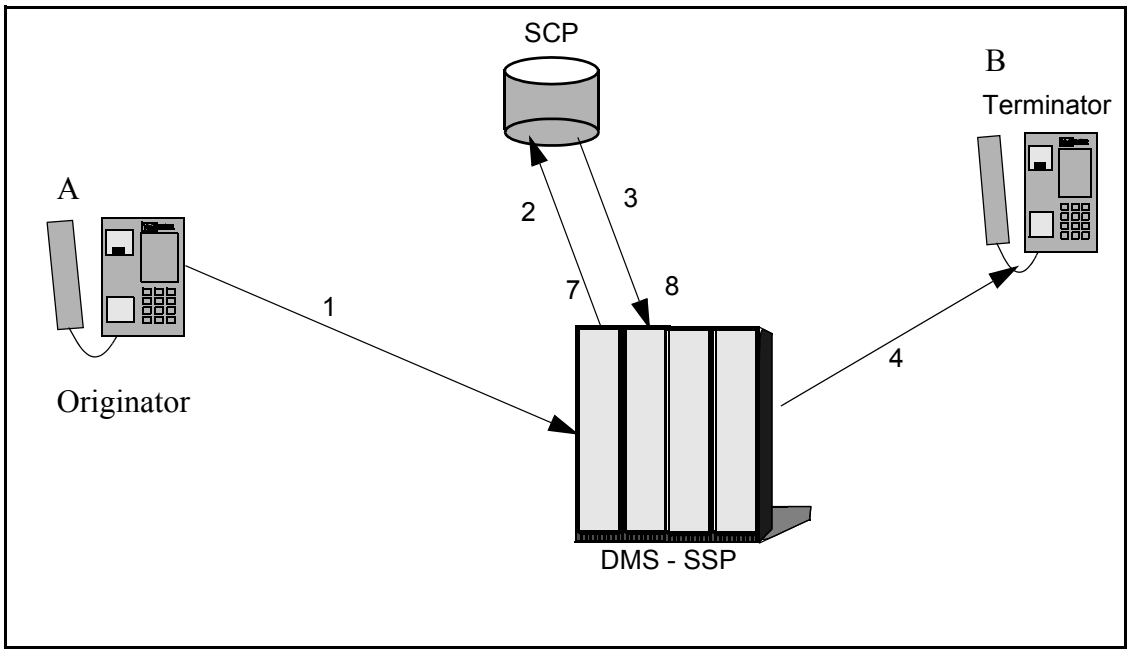
The basic call scenario follows:

1. The Originator (calling Party) dials an SDS number
2. SDS trigger query is sent to the SCP
3. SCP responds with AR+RRBCME (O_Disconnect Event is armed)
4. AR routes the call to terminator B
5. B answers and speech path is established between A and B
6. A disconnects from the call
7. O_Disconnect EDP-R is sent to SCP/Adjunct
8. SCP/Adjunct sends a Disconnect response
9. AIND treatment is applied to the originator. i.e Treatment is not played to the originator, however a log is generated against the originator
10. Terminator gets DISC treatment

8.11.6 Sample call for O_Disconnect_Called event

The O-Disconnect_Called event call flow is shown in the figure below.

Figure 55 Call Flow: O_Disconnect_Called Event



The basic call scenario follows:

1. The Originator (calling Party) dials an SDS number
2. SDS trigger query is sent to the SCP
3. SCP responds with AR+RRBCME (O_Disconnect Event is armed)
4. AR routes the call to terminator B
5. B answers and speech path is established between A and B
6. B disconnects from the call
7. O_Disconnect EDP-R is sent to SCP/Adjunct
8. SCP/Adjunct sends one of the following messages:
   a. Disconnect - AIND treatment applied to originator
   b. Analyze_Route
   c. Collect_Info
   d. Send_To_Resource

8.12 Timeout Requested Event

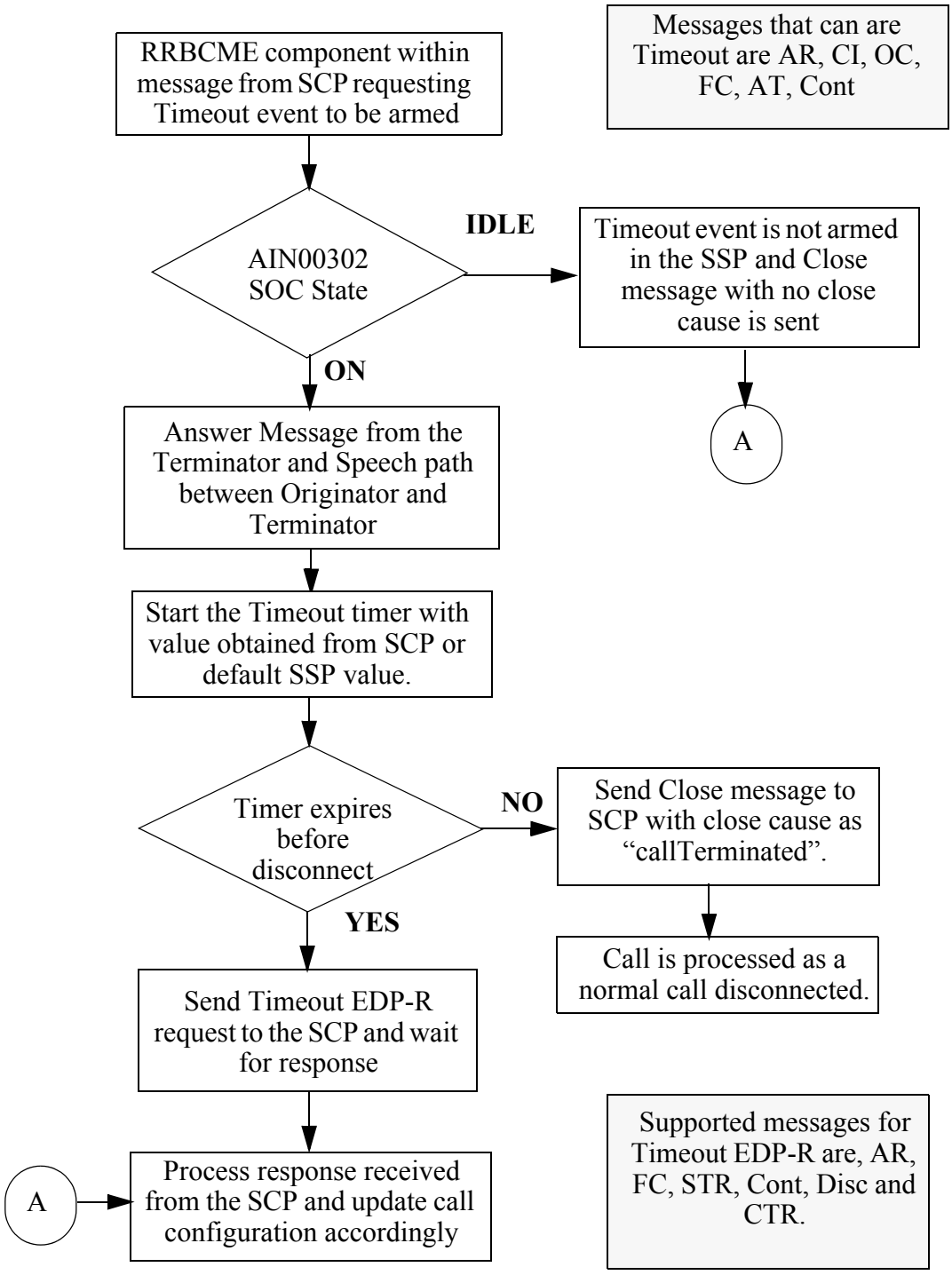
This section describes the Timeout Requested event.

8.12.1 Product View

The Timeout Requested event implements the Timeout Requested event FS.

The functional behavior of the Timeout Requested event is shown in the following figure.

Figure 56 Timeout Requeste even Functional Behavior Diagram



8.12.2 Arming the Timeout Requested event

The Timeout event is armed when requested in the RRBCME component of the following messages:

- Analyze_Route
- Collect_Info
- Offer_Call
- Authorize_Termination
- Forward_Call
- Continue

When any message other than these attempts to arm the Timeout Requested event,, the event is not succesfully armed and a Close message without a close cause is returned to SCP.

8.12.3 Multiple Timeout events armed

If OCM METT SOC AIN00272 is ON and if more than one Timeout event is armed in the same call leg, the First Timeout event is closed with the closecause of "EDPsCompleted". The other NEL remains active. This applies to the whole leg. When the first Timeout armed is in OBCM and the second in TBCM, the latter is active and the former is closed with closecause of "EDPsCompleted".

If OCM METT SOC AIN00272 is IDLE, the first NEL remains active while the second NEL is closed with no closecause. When the first Timeout armed is in OBCM and the second in TBCM, the first is active and second is closed with no closecause.

8.12.4 Timeout Requested event detection and processing

The Timeout timer is started when speech path is established between the controller and the appropriate passive leg. The SSP detects the Timeout event when the Timeout event timer expires. When multiple events are armed in the EDPRequest parameter of the same RRBCME component, only the first event is detected and reported to the SCP. The remaining events are not detected.

The value of the timer is determined in the following order:

1. The value of parameter Request_Report_BCM_Event TimeoutTimer, when present.
2. The value of parameter AIN_TIMEOUT_TIMER in Table OFCENG, when provisioned. The default value for AIN_TIMEOUT_TIMER in Table OFCENG is 300 seconds.

Timeout Timer can be specified either as IntervalTime, LocalSSPTime or AbsoluteSCPTime. The user does not datafill these parameters, they are armed by the SCP.

1. When IntervalTime is specified, the SSP interprets the value received as the time interval when the Timeout event is detected.
2. When LocalSSPtime is specified, the SSP interprets it as the time when the Timeout event is detected according to local Time zone of SSP.
3. When AbsoluteSCPTime is specified, the SSP interprets it as the time when the Timeout event is detected according to local Time zone of SCP. The Local Time zone of SCP is assumed to be same as local time zone of SSP.
4. When no parameter is specified, the value of AIN_TIMEOUT_TIMER in Table OFCENG is used. The default value of AIN_TIMEOUT_TIMER in Table OFCENG is 300 sec.
5. When LocalSSPTime is earlier than the current time of the SSP, or AbsoluteSCPTime is earlier than current time of SCP (same as current time of SSP), SSP sends an ApplicationErrorMessage to SCP with ErrorCause as “erroneous data value”.
6. When more than one TimeoutTimer parameter is present in the message received from SCP, the whole Timeout RRBCME component is rejected and SSP sends an ApplicationErrorMessage to SCP with ErrorCause as “erroneous data value”.
7. The Maximum Timer value supported for Timeout Timer parameters LocalSSPTime and AbsoluteSCPTime is 24 hours or 86400 seconds. This representis the maximum difference of time between theLocalSSPTime or AbsoluteSCPTime and the current SSP time, at the time of event arming, supported is 24 hours. If timer value is greater than 24 hours, the Timeout NEL is not armed and an ApplicationErrorMessage with ErrorCause as “erroneous data value” is sent to SCP.

8.12.4.1 Timeout Timer Resetting and Cancelling

1. The SSP resets the Timeout timer when the SSP initiates timer Timeout as a result of an initial Timeout Requested event and a subsequent Timeout Requested event is detected. The first Timeout Requested event is closed with closecause eDPsCompleted. The SSP resets the Timeout timer to the value set by the SCP/Adjunct associated with the subsequent Request_Report_BCM_Event message requesting the Timeout event.

When this value is not available, the Timeout timer is reset to the default Timeout timer value administered by the SSP.

2. The Timeout Timer is cancelled when timer Timeout is initiated when the SSP encounters a Timeout Requested event for the following cases:
   a. The SSP detects the T_Disconnect (Called) event, which occurs when the timed release disconnect timer expires at this SSP, or when disconnect timing is not to be done, directly following the receipt of the T_Suspended event.
   b. The SSP detects an O_Disconnect or T_Disconnect event, which occurs when a disconnect indication is received from the originating (controlling) access.

8.12.4.2 Response Processing

When the SSP receives the SCP response, the SSP decodes the response and processes the call according to the instructions contained in the message.

Valid SCP response messages for a Timeout Requested Event query message in OCM side are:

- Disconnect
- Analyze_Route
- Send_To_Resource
- Continue
- Connect_To_Resource

Valid SCP response messages for a Timeout Requested Event query message in TCM side are:

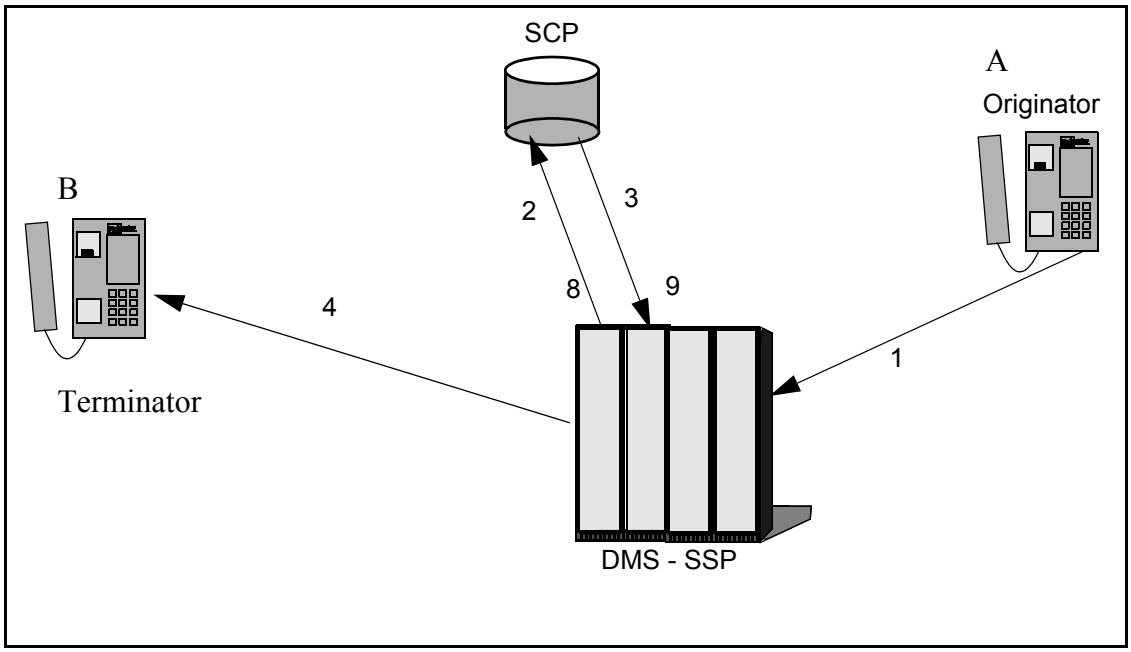
- Disconnect
- Forward_Call
- Send_To_Resource
- Continue
- Connect_To_Resource

When Timeout EDP-R is sent and an invalid response is returned from SCP, SSP will send an Application_Error message containing an ErrorCause parameter with a value of “Unexpected Message.”

Analyze_Route, Forward_Call, Collect_Info and Send_To_Resource response processing is not supported in passive leg (that is inactive leg)Timeout. When such a message is recived in passive leg SSP will send an Application_Error message containing an ErrorCause parameter with a value of “Unexpected Message.”

8.12.5 Sample Call for Timeout event

Figure 57 Call Flow: Timeout Requested EDP



The basic call scenario follows:

1. The Originator (calling Party) dials an SDS number.
2. The SDS trigger query is sent to SCP.
3. SCP responds with an AR+RRBCME. The Timeout Event is armed and AIN_TIMEOUT_TIMER is set up accordingly.
4. The AR routes the call to terminator B.
5. B answers and speech path is established between A and B.
6. The Timeout Timer starts for the call between A and B.
7. The Timer expires and the Timeout Event is detected.
8. A Timeout EDP-R is sent to SCP/Adjunct.
9. The SCP/Adjunct sends a Disconnect response.
10. AIND treatment is applied to the originator.
11. Terminator is disconnected as if caller hung up.

9 Terminating call model triggers

9.1 Overview

This chapter describes the AIN Service Enablers' implementation of following terminating call model triggers:

- Termination_Attempt
- T_Busy
- T_No_Answer

9.2 Termination_Attempt trigger

This section describes the Termination_Attempt trigger.

9.2.1 Product view

The Termination_Attempt trigger implements the Termination_Attempt Trigger FS.

AIN Service Enablers implements the Termination_Attempt trigger according to GR-1298 and GR-1299.

See Section 6.4.4.12 "Termination_Attempt message" on page 212.

9.2.1.1 Interactions with attendant console features

The Attendant Busy Verification feature has precedence over the terminating switch features and all triggers located in the Terminating BCM.

See also Section 20.6 "Attendant console limitations" on page 682 for additional details on attendant console interactions with the Termination_Attempt trigger.

9.3 T_Busy trigger

This section describes the T_Busy trigger, that provides the ability to control routing on an AIN busy cause.

T_Busy trigger is subscribed on a DN basis. T_Busy trigger is not applicable on an office wide basis. T_Busy trigger is not applicable to trunks. PX, P2 and PRI trunks are not applicable to this trigger.

9.3.1 Product view

The T_Busy trigger provides the T_Busy Trigger FS.

The T_Busy trigger consists of the following functions:

- T_Busy trigger Detection and processing
- T_Busy trigger Request message and processing
- Continue message and processing
- Forward_Call message and processing
- Send_To_Resource message and processing

9.3.2 T_Busy trigger detection and processing

This section describes the T_Busy Trigger Detection and Processing FSS.

The T_Busy trigger is encountered when the terminating access is busy or any of the ‘select facility failure’ events occur.

The DMS encounters the T_Busy trigger when one of the following conditions occur:

- for a non-ISDN line, when the line is already involved with an existing call, or when the line has been marked busy
- for an ISDN interface (BRI), when the interface has been marked busy, when no B-channels are available on the interface for the call, or when no idle call references are available on the terminating DN/CT for the call
- for an EKTS group, when all call appearances of the terminating DN/CT are busy
- for a pilot DN or a MLHG or an ISDN MLHG, when no hunt terminals within the group are available and the queue is full
- when any of the Select Facility Failure events occurs:
  - as a result of an analog line being out of order
  - as a result of an ISDN interface being out of order
  - as a result of certain maintenance actions, as described in FR-439: “*system maintenance actions performed by the system include system busy (SysB) and system return-to-service (RTS) and manual maintenance actions performed by a craft person include maintenance and status of interlinks*”.

When the SSP detects a T_Busy trigger, the serial trigger count increments and sends a request message to the SCP or adjunct and does not provide a busy indication to the originator.

9.3.3 Response processing

When the SSP receives the SCP response, it decodes the response and processes the call according to the instructions it contains.

Valid SCP response messages include:

- Continue message
- Forward_Call message
- Send_To_Resource message

When the SSP receives a Send_Notification message along with a Forward_Call or Continue or Send_To_Resource message in response to a T_Busy trigger query, and when the call is released, a Termination_Notification message is sent to the SCP.

9.3.3.1 Continue message and processing

This section describes the Continue Message and Processing FSS

The SCP can respond to a T_Busy query message by sending a Continue message.

When a Continue message is received in response to a T_Busy query message, the SSP performs the following switch-based terminating services that act on the busy event:

- CWT Type features
- CFDA Type features
- Simultaneous Ringing feature

9.3.3.2 Forward_Call message and processing

This section describes the Generic Forward_Call Message and Processing FSS and the Specific Forward_Call Message and Processing FSS.

When the SSP receives a Forward_Call message in response to a T_Busy request message, the SSP shall do the following:

- The SSP will release any resources that were used to process the call between T_NULL and SELECT_FACILITY PICs
- The SSP shall generate Structure 0220 when an AMAslpID parameter is correctly received, according to the GR-1298 requirements, section 9
- The SSP releases the call toward the called party and processes the Foward_Call message.

9.3.3.3 Send_To_Resource message and processing

When the SSP receives a Send_To_Resource message in response to a T_Busy message, the SSP releases the call toward the called party, and processes the Send_To_Resource message.

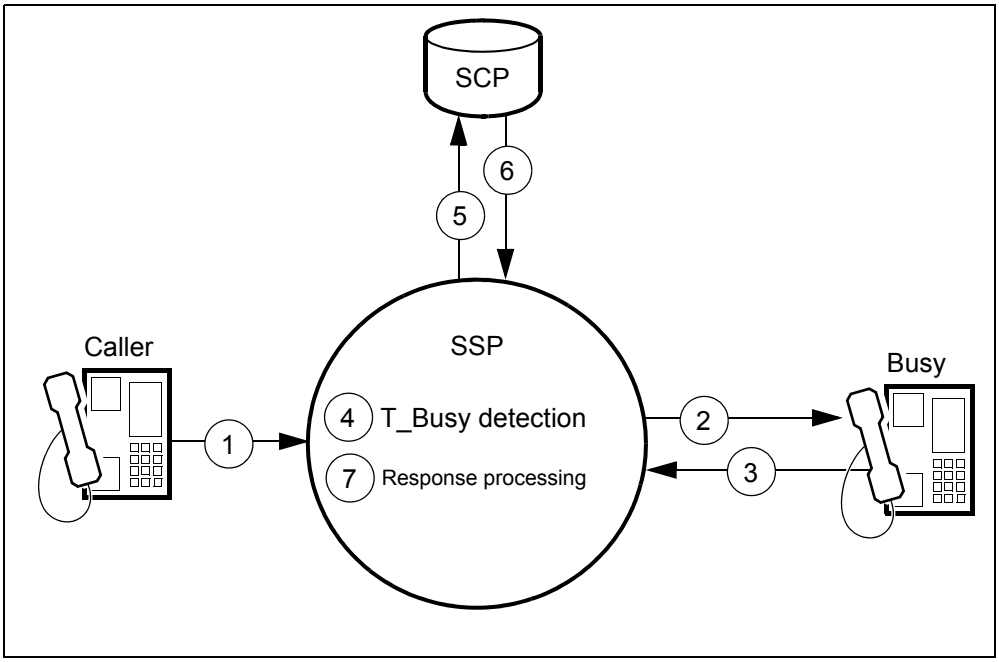
9.3.4 Sample Call

This section describes sample intra-switch call for T_Busy trigger.

Figure 58 on page 461 describes the basic call scenario. The originating agent (a calling party) attempts to call a terminating agent (a called party) that is busy at that moment. The terminating agent is subscribed to the T_Busy trigger. The T_Busy trigger is detected and processed during the call attempt.

1. The originator (calling party) dials the terminator (called party) DN.
2. The SSP attempts to establish a connection with the called party.
3. The attempt to establish a connection fails and the SSP is indicated that the called party is busy.
4. The called party busy criteria is met. The T_Busy trigger is detected. The calling party does not yet hear busy indication.
5. The T_Busy trigger request message is sent to the SCP. The SSP does not provide the busy indication to the calling party. (It waits for instructions from the SCP response.)
6. The SCP sends a valid response message to the SSP with the instructions to continue call processing.
7. The T_Busy response (Continue, Forward_Call or Send_To_Resource) is decoded and call processing is resumed accordingly.

Figure 58 T_Busy Basic call scenario



9.3.5 Interactions with DMS Features

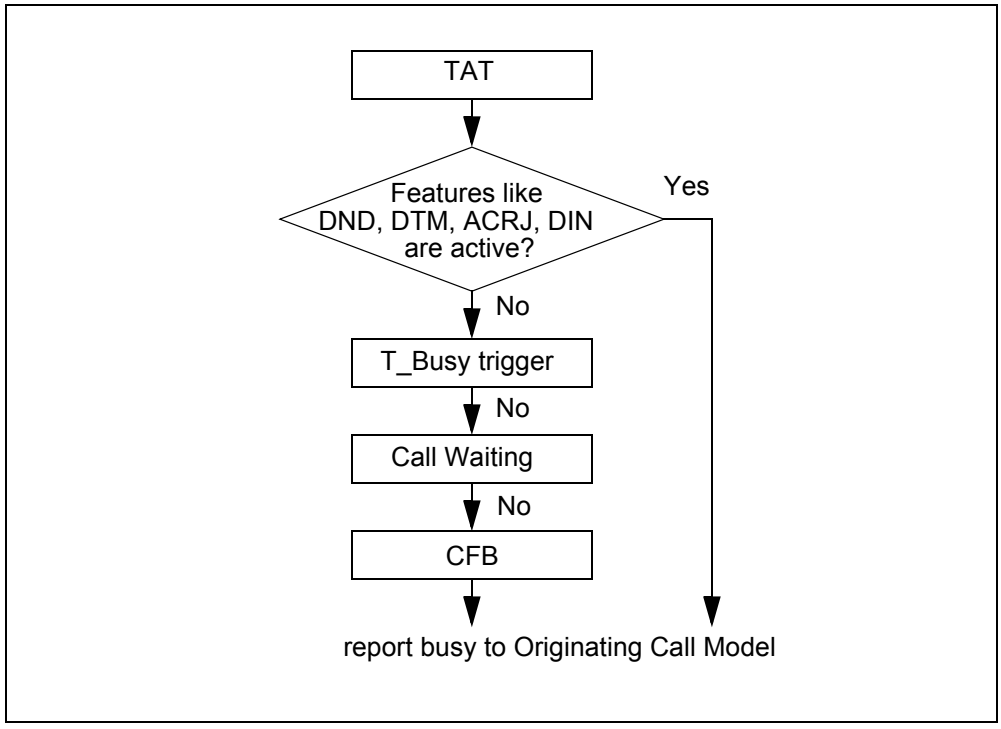
As specified by GR-1298, the following features have precedence over T_Busy trigger. The call can be rejected when the following features are encountered:

- Anonymous Call Rejection (ACRJ)
- Denied Incoming (DIN)
- Do Not Disturb (DND)
- Denied Termination (DTM)
- Make Set Busy/Make Set Busy Intergroup (MSB/MSBI)
- Plug Up (PLP)
- Selective Call Rejection (SCRJ)
- Selective Call Acceptance (SCA)
- Suspended Line/Request Suspended Line (SUS/RSUS)

When any of these features are active, then the T_Busy trigger is not encountered.

Figure 59 on page 462 illustrates precedence between T_Busy and the switch-based features mentioned in this section.

Figure 59 TAT, T_Busy and Switch-based Feature Precedence



Trigger T_Busy takes precedence over the following switch-based features:

- Call Forward Busy features
- Call Waiting features
- ISDN Additional Call Offering

9.3.6 Interactions

See Chapter 21: “AIN interactions introduction” on page 717 through Chapter 2: “AIN/DMS-100 interactions (S to Z)” on page 163 for interactions with trigger T_Busy.

9.4 T_No_Answer trigger

This section describes the T_No_Answer trigger, that can be used to provide services where the user needs alternatives during terminating no answer call conditions.

T_No_Answer trigger can be subscribed to on a line basis. T_No_Answer trigger cannot be subscribed on an entire office wide basis. Trunks also cannot subscribe to T_No_Answer trigger.

9.4.1 Product View

The T_No_Answer trigger provides the T_No_Answer FS.

The T_No_Answer trigger consists of the following functions:

- T_No_Answer trigger Detection and processing
- T_No_Answer trigger Request message and processing
- Continue message and processing
- Forward_Call message and processing
- Send_To_Resource message and processing

9.4.2 T_No_Answer trigger detection and processing

This section describes the T_No_Answer Trigger Detection and Processing FSS.

The SSP encounters the T_No_Answer trigger when the T-TNoAnswer timer expires.

After the T-TNoAnswer trigger timer expires, the SSP sends the T_No_Answer message to the SCP or adjunct and increments the serial trigger count. The SSP continues to alert the called party and continues audible ringing tone to the calling party

The SSP continues alerting the terminating access and continue audible ringing tone to the calling party.

The default value of the AIN_T_NO_ANSWER_TRIGGER_TIMER office parameter in TABLE OFCENG is 18 seconds.

9.4.2.1 T-TNoAnswer trigger timer canceled

The SSP shall cancel timer T-TNoAnswer when any of the following occur:

- The SSP detects that the called party answers the call (T_Answer event)
- The SSP detects the Call_Rejected event. The Call Rejected event occurs when the call is rejected by the terminating party or an expected response is not received.
- The SSP detects the T_Disconnect event, that occurs when the originating party disconnects from the call.
- A feature causes the switch to clear the call towards the called party.

9.4.3 T_No_Answer trigger request message and processing

This section describes T_No_Answer trigger Request Message and Processing FSS.

After the T-TNoAnswer trigger timer expires, the SSP sends the T_No_Answer message to the SCP or adjunct and increments the serial trigger

count. The SSP continues to alert the called party and continues audible ringing tone to the calling party.

See Table 53 on page 216, for a description of T_No_Answer trigger request message parameters.

The SSP receives the SCP response, decodes it and processes the call according to the instructions it contains. Valid SCP response messages include

- Continue
- Forward_Call
- Send_To_Resource

9.4.3.1 T_No_Answer Called party answers

When the SSP detects that the called party answers the call while waiting for an SCP response, then the SSP shall:

- Cut through connection to the called party
- Keep timer T1 running, awaiting a response from the SCP.

When the SSP receives a Forward_Call message, then the SSP shall ignore the response.

When the SSP receives a Send_To_Resource message, then the SSP shall send a Resource_Clear message and populate the ClearCause parameter with "CalledPartyAnswered" value. The SSP shall not process the Send_To_Resource message.

When the SSP receives a Send_Notification message along with a Forward_Call or Continue or Send_To_Resource message in response to a T_NoA trigger query, and when the call is released, a Termination_Notification message is sent to the SCP.

9.4.4 Continue message and processing

The SCP may respond to T_No_Answer query message by sending a Continue message.

The SCP may respond to T_No_Answer query message by sending a Continue message. According to GR-1298, when a Continue message is received as a response, the SSP shall continue call-processing and continue to alert the called party.

When the SSP receives a Continue response from a T_NoAnswer query, the call processing performs any non-timer and switch-based terminating features that apply to the call. Note that no feature is encountered when the SSP receives a Continue response from the T_NoAnswer triggers since no

non-timer based DMS features can activate on the terminating half call once a call starts ringing.

When timer-based features (for example CFDA) and the T_NoA trigger are provisioned and are encountered on a call, only the feature that has the shortest no-answer timer is encountered. The features with longer timers are not encountered for the call. As a result, when a T_NoA query message is sent because the T_TNoAnswer trigger timer is shorter than the other timer-based features and a Continue response is received, the other timer-based features are not activated for the current call.

The current behavior between the T_NoA trigger and timer-based features is not compliant to requirement R-[423v2] of GR-1298, Issue 3, revision 1. However, this behavior is compliant to the latest requirement R-[423v3] of GR-1298, Issue 4.

9.4.5 Send_To_Resource message and processing

When the SSP receives a Send_To_Resource message in response to a T_No_Answer message, the SSP releases the call toward the called party, and processes the Send_To_Resource message.

9.4.6 Forward_Call message and processing

The SCP can respond to a T_No_Answer query message by sending a Forward_Call message.

According to GR-1298, when a Forward_Call message is received as a response, the SSP performs the following tasks:

- initiate call clearing towards the called party
- release resources that were used to process the call
- remove audible ringing tone to the calling party, when it provides a tone
- provide AMA treatment according to the GR-1298 requirements, section 9 (refer to ACTID AF7505 for further information)

9.4.7 SendNotification message and processing

When the SSP receives a SendNotification message in a response to a T_NoAnswer message, the notification is stored until the call encounters the NULL PIC.

9.4.8 Sample Call scenarios

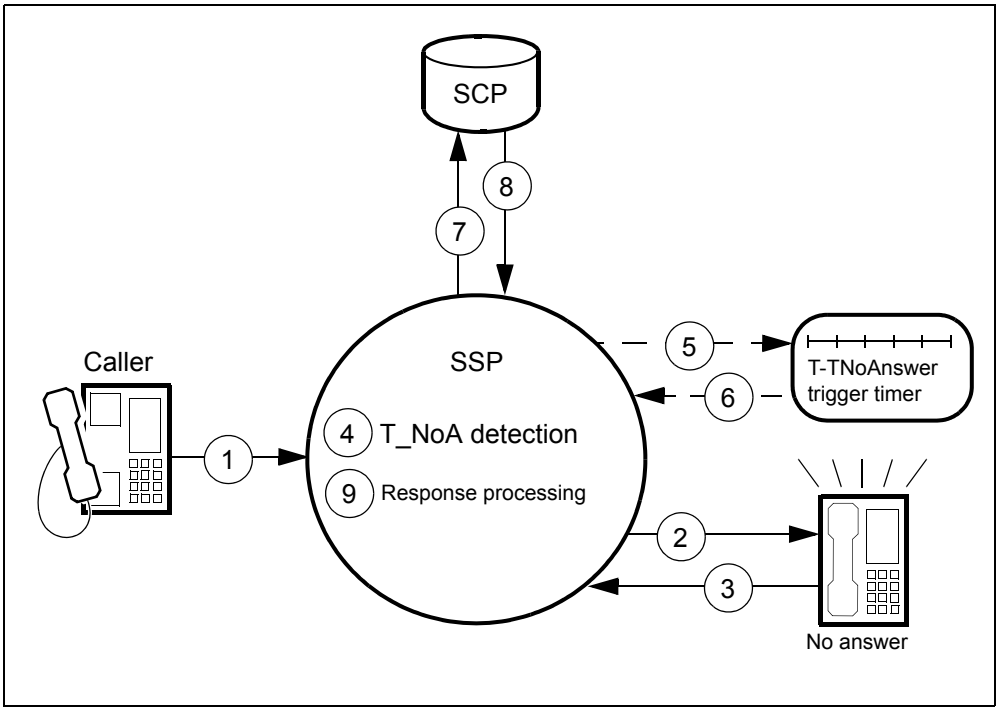
This section describes different call scenarios encountered when T_No_Answer trigger is detected. All scenarios described in this section are intra-switch scenarios.

9.4.8.1 T_No_Answer Basic Call

Figure 60, describes the basic call scenario where an originating agent (a calling party) attempts to call a terminating agent (a called party) that is not answering at that moment. The terminating agent is subscribed to the T_No_Answer trigger. During the attempt, the T_No_Answer trigger is detected and processed.

1. The calling party dials the called party DN.
2. SSP checks the status of the called party.
3. SSP detects the called party is on-hook.
4. The T-TNoAnswer trigger timer expires.
5. Called party is alerted and T_No_Answer trigger is detected.
6. The T-TNoAnswer trigger timer is started by the SSP.
7. The T_No_Answer trigger request message is sent to the SCP. The SSP does not interrupt the called party audible ringing tone already in progress.
8. The SCP sends a valid response to the SSP.
9. The response is decoded and call processing is resumed according to the instructions contained in the response (Continue, Forward_Call or Send_To_Resource).

Figure 60 T_No_Answer Basic Call

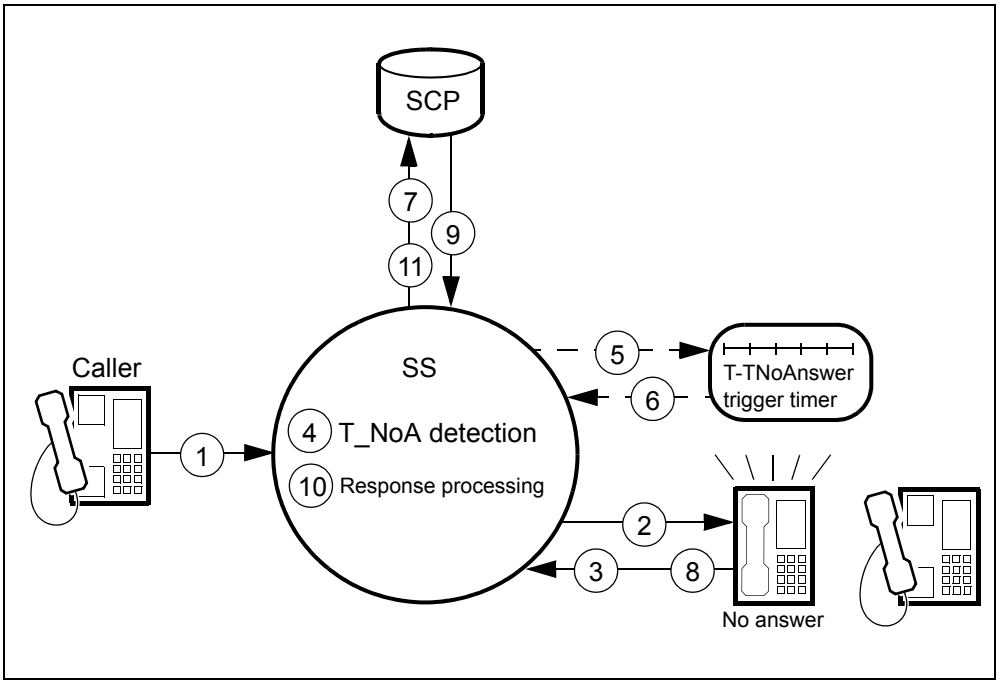


9.4.8.2 T_No_Answer terminating agent goes off-hook

Figure 61 on page 468, describes the call scenario where an originating agent (a calling party) attempts to call a terminating agent (a called party) that is not answering at that moment. The terminating agent is subscribed to T_No_Answer trigger. During the attempt, the T_No_Answer trigger is detected, a timer is started and expires, and an T_No_Answer trigger request message is sent to the SCP. Before the response is received, the terminating agent goes off-hook (answers the call).

1. The calling party dials the called party DN.
2. SSP checks the status of the called party.
3. SSP detects the called party is on-hook.
4. Called party is alerted and T_No_Answer trigger is detected.
5. The T-TNoAnswer trigger timer is started by the SSP.
6. The T-TNoAnswer trigger timer expires.
7. The T_No_Answer trigger request message is sent to the SCP.
8. The SSP does not interrupt the called party audible ringing tone already in progress.
9. The called party answers (goes off-hook). The call completes and all resources used by the T_No_Answer processing are cleared including the called party resources.
10. The SCP sends a valid response to the SSP.
11. The SSP receives the response and discards it since the trigger processing waiting for this response has been canceled.

Figure 61 T_No_Answer terminating agent goes off-hook



9.4.9 Interactions

See Chapter 21: "AIN interactions introduction" on page 717 through Chapter 2: "AIN/DMS-100 interactions (S to Z)" on page 163 for interactions with trigger T_No_Answer.

9.5 Trigger Term Resource Available

Trigger Term Resource Available (TRA) applies to the AIN terminating call model (TCM). The trigger enhances AIN trigger detection point (TDP) processing.

At the exit of the Select Facility PIC, the SSP can hit trigger TRA when the terminating resource is not busy.

Operating company personnel datafill the SSP to hit this trigger. Each terminating agent has its own datafill. When the call hits this trigger, a query goes to the SCP and requests further instructions on how to process the call. The SSP intercepts the audible ring indication that gets sent to the originating call half and sends a TRA trigger query to the SCP. At the same time, the SSP blocks power ringing to the terminating agent.

Based on the valid response received from the SCP, the call either terminates on the called DN or forwards to another DN.

When the call does not hit this trigger, call processing continues to the next point in call (PIC).

9.6 TKTERM trigger

AIN Trunk Group Trigger (TKTERM) feature is implemented on the Terminating Call Model (TCM) and is an enhancement to the AIN trigger processing functionality.

The TKTERM trigger provides the SSP with the ability to detect it when a termination attempt has been made on the trunk group. The SSP then initiates communication with the SCP to obtain additional instructions on processing the call.

Trunk_Group_Trigger is implemented at the Termination_Attempt TDP and the TKTERM trigger is enabled by data filling on the SSP. The TKTERM trigger is detected at the TERMATT TDP when a termination_Attempt is made on a trunk group. The TKTERM trigger is encountered either on public or private trunks groups and it essentially behaves very similar to the existing Termination_Attempt (TAT) Trigger. When the trigger is detected, a query is launched to the SCP requesting additional instructions for processing the call. Based on the valid response received from the SCP, the call will be either terminated on the called party or forwarded to some other called party.

10 Terminating call model events

10.1 Overview

This chapter describes the AIN Service Enablers' implementation of the following terminating call model events:

- T_Answer
- T_Busy
- T_No_Answer
- Timeout

10.2 Limitations

See Section 20.20 "Event limitations and restrictions" on page 692 for limitations associated with events.

10.3 T_Answer event

The T_Answer event enhances AIN Service Enablers events by providing the customers with an addition to the next event lists (NELS), the T_Answer notification event.

10.3.1 Product view

The T_Answer notification event consists of the following functions:

- T_Answer notification event detection
- T_Answer notification event message and processing

10.3.2 T_Answer notification event detection

The DMS SSP detects the T_Answer notification event when the switch receives indication that the terminating party went off-hook.

10.3.3 T_Answer notification message and processing

On detecting the T_Answer notification event, the SSP:

- sends the T_Answer event notification message to the SCP or adjunct
- a CLOSE message to the SCP or adjunct
- continues to process the call

10.3.4 T_Answer event notification message

Table 55 on page 217 lists the parameters that make up the T_Answer event notification message.

10.3.5 Interactions

T_Answer event interactions are inherited from the TCM NEL feature. See Chapter 22: “AIN/DMS-100 interactions (A and B)” on page 707 through Chapter 2: “AIN/DMS-100 interactions (S to Z)” on page 163.

10.3.6 Limitations

T_Answer event limitations are identical to those of other AIN events. See Section 20.20 “Event limitations and restrictions” on page 692.

10.4 T_Busy event

This section describes the T_Busy event.

10.4.1 Product view

The T_Busy event implements the T_Busy Event FS.

The T_Busy event consists of the following functions:

- T_Busy event detection
- Generic Forward_Call message and processing
- T_Busy event request message and processing
- Continue message and processing
- Send_To_Resource message and processing

10.4.2 T_Busy event detection

The DMS-100 switch encounters the T_Busy event when the event is armed and one of the following conditions is met:

- for a non-ISDN line,
  - — when the line is already involved with an existing call, or
  - — when the line has been marked busy
- for an ISDN interface,
  - — when the interface has been marked busy,
  - — when no B-channels are available on the interface for the call, or
  - — when no idle call references are available on the terminating DN/CT for the call
- for an EKTS group, when all call appearances of the terminating DN/CT are busy
- for a pilot DN or a MLHG or an ISDN MLHG, when no hunt terminals within the group are available

When the SSP detects a T_Busy requested event, it sends a T_Busy event request message to the SCP or adjunct and does not provide a busy indication to the originator.

10.4.2.1 Interactions with DMS features

See Chapter 22: “AIN/DMS-100 interactions (A and B)” on page 707 through Chapter 2: “AIN/DMS-100 interactions (S to Z)” on page 163.

10.4.3 T_Busy event request message and processing

This section describes the implementation of the T_Busy EDP-Request Message and Processing FSS.

When the T_Busy requested event is encountered, the DMS-100 switch SSP

- blocks busy indication to the originating access
- sends the T_Busy message to the SCP or adjunct
- increments the serial trigger count

See Section 6.4.4.14 “T_Busy event request message” on page 215.

10.4.4 Forward_Call message and processing

This section describes the implementation of the Generic Forward_Call Message and Processing FSS and the Specific Forward_Call Message and Processing FSS.

When the SSP receives a Forward_Call message in response to a T_Busy or a T_No_Answer event request message

- the SSP releases the call toward the called party
- closes the extended transaction
- processes the Forward_Call message

See Section 6.6.5 “Forward_Call message” on page 281.

10.4.5 Continue message and processing

This section describes the implementation of the Events/Continue Message and Processing FSS and the T_Busy/Continue Message and Processing FSS.

According to GR-1298, when a Continue message is received in response to T_Busy, the SSP performs any switch-based terminating services that act on the busy event. When a Continue message is received following the detection of the T_Busy event, switch-based terminating features that act on the busy event are not encountered (for example: call forwarding busy line, call waiting, and ISDN additional call offering). The SSP returns a busy indication to the call originator. This is in noncompliance to GR-1298 requirements.

When trigger O_Called_Party_Busy is provisioned, it is detected once the busy indication is passed to the originating call half. The detection occurs before the busy indication is played to the call originator.

A NEL message sent with a Continue message after T_Busy can request the T_No_Answer event to be armed. Due to restrictions for T_Busy interactions with call waiting and call forward busy, the T_No_Answer event is never detected after T_Busy event detection.

See Section 6.6.3 “Continue message and processing” on page 279.

10.4.6 Send_To_Resource message and processing

When the SSP receives a Send_To_Resource message in response to a T_Busy or a T_No_Answer event request message

- the SSP releases the call toward the called party
- closes the NEL
- processes the Send_To_Resource message.

See Section 12.1 “STR message / Internal resource” on page 491.

10.5 T_No_Answer event

The following section describes the T_No_Answer event.

10.5.1 Product view

The T_No_Answer event implements the T_No_Answer Event FS.

The T_No_Answer event consists of the following functions:

- T_No_Answer event detection
- T_No_Answer event request message and processing
- Forward_Call message and processing
- Continue message and processing
- Send_To_Resource message and processing

10.5.2 T_No_Answer event detection

This section describes the implementation of the T_No_Answer Event Detection FSS.

10.5.2.1 Starting the T-TNoAnswer event timer

The T-TNoAnswer event timer starts when the SSP is informed that the call has been sent to the terminator and no T-ONoAnswer trigger timer is active. That is, the T-TNoAnswer event timer starts when the SSP provides power ringing to a non-ISDN line or sends a SETUP message to an ISDN interface. A Close message with the close cause of "EDPs Completed" is sent to the SCP.

10.5.2.2 Detecting the T_No_Answer event

The SSP detects a T_No_Answer event when it is armed and the T_TNoAnswer event timer expires.

The value of the timer is determined in the following order:

- the value of the TNoAnswerTimer parameter, when it is present in the Request_Report_BCM_Event message
- the value of the AIN_T_NO_ANSWER_EVENT_TIMER office parameter in the OFCENG table, when it is provisioned
- default value of 18 seconds

10.5.2.3 Interactions with DMS features

See Chapter 22: "AIN/DMS-100 interactions (A and B)" on page 707 through Chapter 2: "AIN/DMS-100 interactions (S to Z)" on page 163.

10.5.2.4 Cancelling the T-TNoAnswer event timer

As specified by GR-1298, when the T-TNoAnswer event timer is initiated, the timer is stops when any of the following occurs:

- the call is answered
- the caller abandons the call

- the SSP detects that an ISDN line has rejected the call (Call_Rejected event)
- T_Busy event is detected as described in Section 10.4.2 “T_Busy event detection” on page 473
- any forwarding or redirecting feature is activated at the same switch where the T_No_Answer event is armed

10.5.3 T_No_Answer event request message and processing

This section describes the implementation of the T_No_Answer EDP-Request Message and Processing FSS.

After the T-TNoAnswer event timer expires, the DMS SSP:

- sends the T_No_Answer message to the SCP or adjunct
- increments the serial trigger count
- continues to alert the called party
- continues audible ringing tone to the calling party

See Section 6.4.4.16 “T_No_Answer event request message” on page 217.

10.5.3.1 T_No_Answer called party answers

When the called party answers the call while waiting for an SCP response, then the action performed depends on the SCP response and package type as shown in Table 130.

Table 130 T_No_Answer called party answers

SCP message	Package type	Action
Forward_Call, Send_To_Resource (STR) or Continue	Response	Close the transaction
Forward_Call or Continue	Conversation	Send a Close message in a response with CloseCause=calledPartyAnswered.
Send_To_Resource (STR)	Conversation	Send a Resource_Clear message in a response with ClearCause=calledPartyAnswered.
Send_Notification or ACG	Conversation	The DMS SSP will process the ACG request. For Send Notification, a Termination Notification message is sent to the SCP with exception set when no other SN has been requested for this transaction.

10.5.4 Forward_Call message and processing

See Section 10.4.4 “Forward_Call message and processing” on page 473.

10.5.5 Continue message and processing

This section describes the implementation of the Events/Continue Message and Processing FSS and the T_No_Answer/Continue Message and Processing FSS.

When the SSP receives a Continue message in response to a T_No_Answer message, it continues to alert the called party.

> ***Note:*** Call Forward Don’t Answer (CFDA) features are not encountered as specified by Bellcore.

As specified by GR-1298, caller interactions, such as Send_To_Resource, are not allowed between a T_No_Answer event request message and the Continue response. A Continue message received in this case is treated as a fatal Unexpected Message and the SSP applies final treatment.

See Section 6.6.3 “Continue message and processing” on page 279.

10.5.6 Send_To_Resource message and processing

See Section 12.1 “STR message / Internal resource” on page 491.

10.6 Timeout Event

The Timeout event can be armed in the Terminating call model. Refer to Section 8.12 for a description of the Timeout event.

10.7 Attendant console interactions with TCM events

For console extended calls that encounter the Termination_Attempt trigger, any armed TCM event causes a query to be sent to the SCP and the corresponding response to be processed. This is true unless the console releases after having extended the call, in that case the NEL is closed.

11 Participant interactions

This chapter gives an overview of Capability Set-4; Participant Interactions. It introduces the participant interaction configurations with an intelligent peripheral (IP) and covers FS-4-6; IP timing and tolerances.

In Chapter 11 to Chapter 16, GR-1129-CORE, Issue 2, requirement numbers are indicated with global requirement numbers in italics within square brackets, for example, *[35]*.

Chapter 12: “Generic SCP-SSP interactions for Send_To_Resource” on page 491, documents FS-4-1; Generic SCP-SSP Interactions for Send_To_Resource (STR). It gives a detailed description of the messages exchanged, and parameters supported, between the SCP and the SSP for Send_To_Resource processing.

Chapter 13: “Generic SSP-IP interactions for Send_To_Resource” on page 503, documents FS-4-2; Generic SSP-IP interactions for Send_To_Resource. It gives a detailed description of the ROSE encoded PRI Facility Information Element (FIE) and ISUP Remote Operations (RO) parameters used for STR processing.

Chapter 14: “STR processing with an SSP resource” on page 519, states that AIN SE Send_To_Resource processing with an internal resource, FS-4-3, is identical to STR processing for AIN essentials.

Chapter 15: “STR connection to a local IP” on page 549, documents FS-4-4; STR Processing with a local IP (for PRI). It covers connection setup and take-down scenarios, intermediate information exchange between SCP and IP, through the SSP, and the exception and error scenarios.

Chapter 16: “STR connection to a remote IP” on page 577, documents FS-4-5; STR Processing with a remote IP (for PRI), by covering the connection setup and take-down scenarios, intermediate information exchange between SCP and IP, through the SSPs, and the exception and error scenarios.

Chapter 17: “Connect_To_Resource” on page 573, is an SCP/Adjunct message sent to an SSP in response to a midcall trigger or event to connect a

user (in talking state) to a resource. It can be received either in a response or a conversation package. The Connect_To_Resource message has similar functionality to the Send_To_Resource message, the difference being when it may be encountered in the call.

11.1 Overview

The Send_To_Resource message is one of the messages that an SSP can receive from an SCP as a response to a query. The Send_To_Resource message instructs the SSP to interact with the calling party using either the resources available on the SSP itself or by connecting the caller to an intelligent peripheral (IP), which uses its own resources for participant interactions. In either case, this interaction consists of playing an announcement to the caller and, optionally, collecting digits from the caller. The intelligent peripheral may support playing multiple announcements and may also support additional functions for participant interactions.

The collected digits are reported back to the SCP in a Call_Info_From_Resource message or a Resource_Clear message. This message is sent from the SSP to the SCP in a conversation package and the transaction between the SSP and the SCP remains open. The next message from the SCP can be any message that is valid for the DP that AIN had triggered.

The SCP can cancel a Send_To_Resource request, that was received in a conversation package by sending a Cancel_Resource_Event message to the SSP, in a conversation package. The SCP may attempt to cancel a non-user-interruptible announcement when zero digits are to be collected by sending a Cancel_Resource_Event operation in a Conversation Package (GR-1298).

The presence of the destinationAddress parameter in the Send_To_Resource message determines whether the participant interactions should be performed by an IP or not. If the destinationAddress parameter is not present, the SSP processes the STR request using its internal resources, which consist of recorded announcements, tones, and digit receivers. If the destinationAddress parameter is present, the caller is connected to an IP.

11.1.1 Limitations

See Chapter 20.4: “Limitations for Send_To_Resource using an IP” on page 681.

11.2 Send_To_Resource and intelligent peripheral configurations

The SSP that encountered the trigger and received the request from the SCP to establish an STR connection is referred to as the local SSP. The IP that is specified by the SCP may or may not have a direct PRI link to the local SSP. A connection that is made from an SSP to an IP in response to a

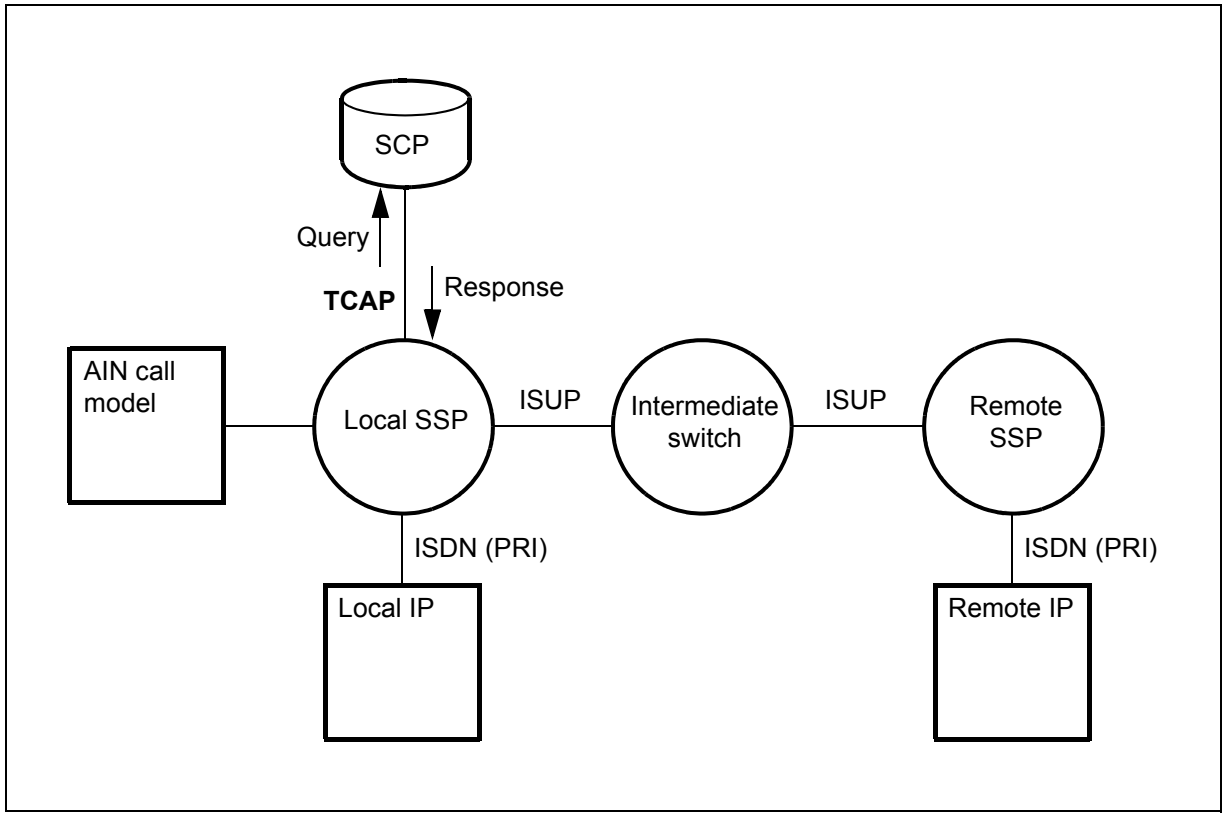
Send_To_Resource message is referred to as a Send_To_Resource connection (STR connection). See Figure 62 on page 481.

If an IP has a direct PRI link to the local SSP, this IP is referred to as a local IP. The local SSP can establish a direct connection to the local IP.

If the requested IP does not have a direct PRI link to the local SSP, the IP will be referred to as the remote IP (relative to the local SSP). The local SSP has to establish an ISUP connection to an SSP that has a direct link to the remote IP.

The SSP that has a direct PRI connection to the remote IP is referred to as the remote SSP. Switches located between the local and remote SSP are called intermediate switches. Intermediate switches are optional.

Figure 62 Local and remote SSP-IP configurations



11.2.1 Functional comments

Only the Northern Telecom National ISDN (NI-2) primary rate interface (NTNI PRI) is supported for the STR connection. See NIS A233-2, NT-NI Primary Rate User-Network Interface Specification (for IP application) for information about NTNI PRI. BRI is not supported for the connection to the IP.

The STR connection is not considered a stable call. In general, features that require a stable call to come in effect are not allowed for the STR connection. As a result, the STR-IP connection does not survive a SWACT.

AIN response translations datafill used for Analyze_Route and Forward_Call is also used to translate the DestinationAddress parameter in the Send_To_Resource message. See Part II "Provisioning" on page 331 for details.

Default Routing is supported for AIN Service Enablers STR processing.

Prior to NA016, equal access was not supported in translating the 10-digit DestinationAddress in national number format. Pre-subscribed equal access carriers were not taken into consideration. When a carrier was required to establish the STR connection to the IP, the SSP denied the STR request and sent a Resource_Clear message with the ClearCause parameter set to ABORT to the SCP.

Equal access is now supported for a Send_To_Resource interaction between an SSP and IP, including support for Carrier, Alternate Carrier, and Second Alternate Carrier in the Send_To_Resource message. When a carrier is not provided for routing to a remote IP across LATAs, connectivity will not be established.

The Attendant Console is not supported for connections to an IP.

11.3 Billing

Send to Resource billing is accomplished by the use of AMAMeasure parameter, along with the AMAslpID for Module Code 290. The AMAMeasurement parameter may be returned in the Resource Clear message. This is controlled by the AMAMeasure parameter. Billing is supported for AMAMeasure when received in a response package or in a conversation package.

11.4 Timers

The sections in this chapter refer to the following AIN and ISDN timers:

- IP Disconnect timer (TDISC), implemented through the AIN_TDISC_TIMER parameter in the OFCENG table
- STR connection timer (TSTRC), implemented through the AIN_TSTRC_TIMER parameter in the OFCENG table

See also Section 12.2.8 "AIN_TDISC_TIMER" on page 477 and Section 12.2.12 "AIN_TSTRC_TIMER" on page 478.

11.4.1 IP Disconnect timer (TDISC)

This function covers FSS-4-6-9.

The SSP initiates the TDISC timer for an ISDN interface after sending a FACILITY message with a cancelIPResource operation that requests the IP to disconnect. If this timer expires, the SSP clears the connection to the IP and notifies the SCP or adjunct.

When the SSP receives a DISConnect message from the IP, the timer is stopped.

AIN_TDISC_TIMER has the following properties:

- The value of AIN_TDISC_TIMER can be provisioned in Table OFCENG. *[236]*
- The timer range is from one to ten seconds in steps of one second. *[237]*
- The default value for this timer is four seconds. *[238]*

11.4.2 STR connection timer (TSTRC)

This function covers FSS-4-6-10.

The Send_To_Resource message is received by the Service Switching Point (SSP) in a Conversation Package or Response Package from the Service Control Point (SCP) in response to an EDP-R or TDP-R. The SSP plays an announcement or tone to the originating party and collect digits (optional). The SSP can receive an STR message with the Destination Address of an Intelligent Peripheral (IP) in a Conversation Package from the SCP in response to an EDP-R or TDP-R. The originator is then connected to the IP. The maximum duration of the IP connection is determined by the value AIN_TSTRC_TIMER in Table OFCENG. The default value of the AIN_TSTRC_TIMER is 6 minutes. The supported range of the AIN_TSTRC_TIMER is 0 to 60 minutes with one minute increments.

The maximum duration of connectivity to the IP is determined by the TSTRCTimer parameter in the STR message. When the SOC AIN00303 is ‘ON’, and the TSTRCTimer parameter is received in a STR or CITR message, the value of the TSTRCTimer parameter supersedes the SSP value of TSTRCTimer (AIN_TSTRC_TIMER value in Table OFCENG) for the duration of the transaction. When the TSTRCTimer parameter is not received, the SSP value is used. In all cases, the TSTRCTimer is started at the Local (Triggering SSP) rather than the Remote SSP.

The TSTRCTimer is stopped and restarted with every intermediate information exchange between the SCP and IP. The IP provides or requests information from the SCP through a Call_Info_From_Resource (CIFR) message (tandemed through the SSP). The SCP responds with a

Call_Info_To_Resource (CITR). When the CITR message has TSTRCTimer parameter, the TSTRC timer is stopped and restarted with the value in the message. When the TSTRCTimer parameter is not provided in the CITR message, the value of AIN_TSTRC_TIMER in Table OFCENG is used.

The TSTRCTimer parameter present in the STR/CITR message can have values from 0 - 300 minutes. When the TSTRCTimer parameter received in the STR/CITR message has a value between 61mins to 300mins, the TSTRC timer value is set to 60min. When the TSTRCTimer parameter value is out of range (greater than 300min), the TSTRCTimer parameter is ignored and the value of AIN_TSTRC_TIMER in Table OFCENG is used to determine the maximum duration of connectivity to the IP. When the TSTRCTimer parameter value is 0, there is no timer control on the duration of connection to the IP.

If the TSTRC timer expires during connection to an IP, a ResourceClear message is sent to the SCP with CloseCause “IpTimeout”.

When the SSP receives a DISConnect or RELease COMplete message from the IP, the TSTRC timer is stopped.

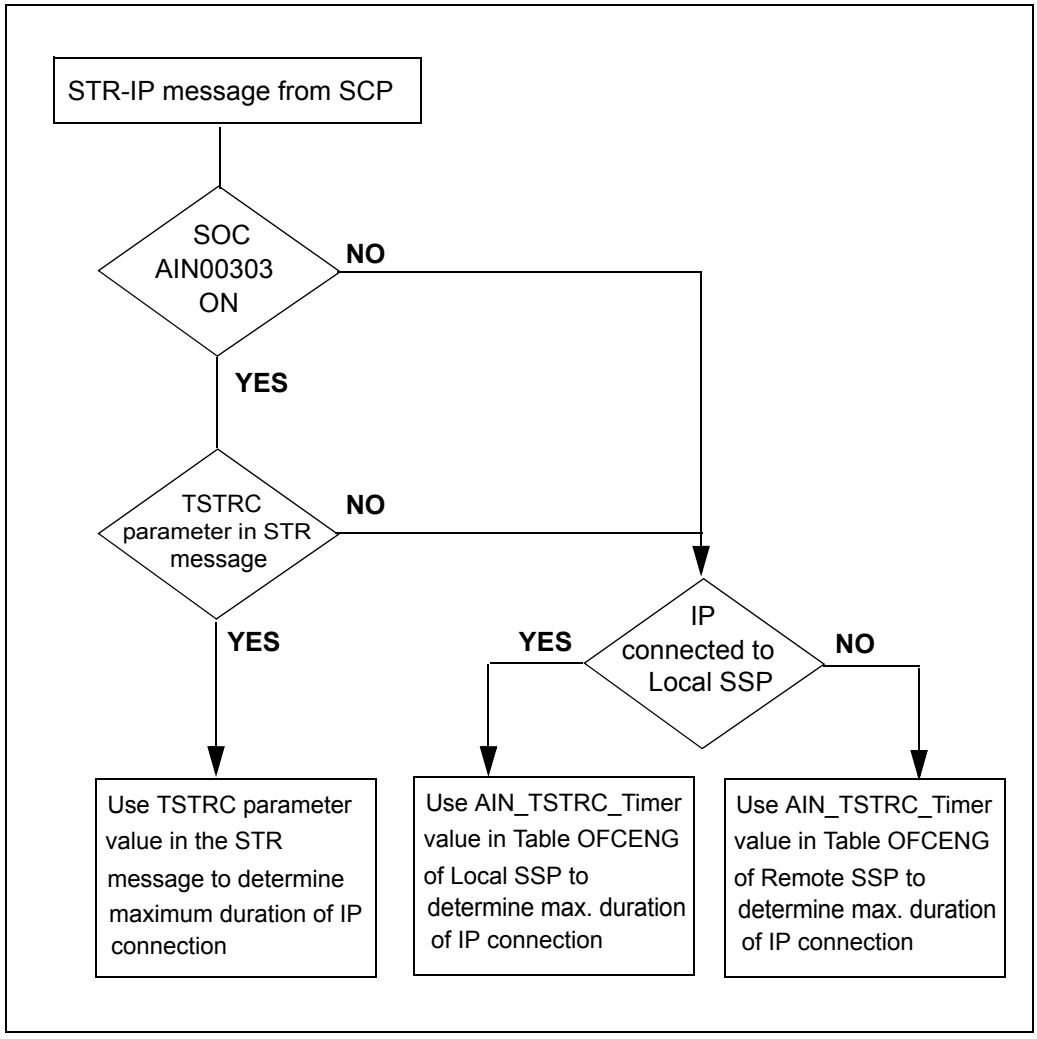
AIN_TSTRC_TIMER has the following properties:

- The value of AIN_TSTRC_TIMER can be provisioned in the OFCENG table. *[239]*
- The timer range is from one to 60 minutes in steps of one minute. *[240]*
- The default value for this timer is six minutes. *[241]*
- The timer may be disabled by setting it to 0. *[242]*

11.4.2.1 Setting the TSTRC Timer

The following figure shows how the maximum duration of the IP connection is determined.

Figure 63 Maximum duration of an IP connection



11.4.2.2 Setting the TSTRC Timer for a Local IP

11.4.2.2.1 SOC AIN00303 is 'IDLE' and TSTRCTimer parameter absent When the SOC AIN00303 is 'IDLE' and the TSTRCTimer parameter is not received in the STR message, the value of AIN_TSTRC_TIMER in Table OFCENG is used to determine the maximum duration of IP connection.

11.4.2.2.2 SOC AIN00303 is 'IDLE' and TSTRCTimer parameter present When the SOC AIN00303 is 'IDLE' and the TSTRCTimer parameter is received in the STR message, the value of AIN_TSTRC_TIMER in Table OFCENG is used to determine the maximum duration of IP connection.

11.4.2.2.3 SOC AIN00303 is 'ON' and TSTRCTimer parameter absent

When the SOC AIN00303 is 'ON' and the TSTRCTimer parameter is not received in the STR message, the value of AIN_TSTRC_TIMER in Table OFCENG is used to determine the maximum duration of IP connection.

11.4.2.2.4 SOC AIN00303 is 'ON' and TSTRCTimer parameter present

When the SOC AIN00303 is 'ON' and the SSP receives a TSTRCTimer parameter in STR message, the value of this parameter is used to determine the maximum duration of connection to the IP.

11.4.2.3 Setting the TSTRC Timer for a Remote IP

This section addresses starting the TSTRC timer for connection to the Remote IP when SOC AIN00303 is in the states given in the Local and Remote SSPs.

11.4.2.3.1 SOC AIN00303 'ON' in the Local SSP and 'IDLE' in the Remote SSP

When the TSTRCTimer parameter is received in the STR message, the TSTRC timer is started at the Local SSP with the value of the TSTRCTimer parameter. When the TSTRCTimer parameter is absent in the STR message, the TSTRC timer is started at the Local SSP with the value of AIN_TSTRC_TIMER present in Table OFCENG. Setscrew timer is also started at the Remote SSP with the value of AIN_TSTRC_TIMER in Table OFCENG of the Remote Switch. When two TSTRC timers are running, one at Local and another at Remote, the first timer to expire releases the connection to IP and sends a ResourceClear with ClearCause "ipTimeout". This is a design limitation, as this is a case of two timers running simultaneously. This would also be the case if the Remote SSP is running NA015 or earlier loads.

11.4.2.3.2 SOC AIN00303 'ON' in the Local SSP and 'ON' in the Remote SSP

When the TSTRCTimer parameter is received in the STR message, the TSTRC timer is started at the Local SSP with the value of the TSTRCTimer parameter. When the parameter is absent in the STR message, the TSTRC timer is started at the Local SSP with the value of AIN_TSTRC_TIMER present in Table OFCENG.

If the SOC AIN00303 state is 'ON' at the Remote SSP, the timer is not started at the Remote SSP.

11.4.2.3.3 SOC AIN00303 'IDLE' in the Local SSP and 'ON' in the Remote SSP

The TSTRC timer is not started at the Local SSP.

The TSTRC timer is not started at the Remote SSP even though the SOC AIN00303 state is 'ON' at the Remote SSP.

11.4.2.3.4 SOC AIN00303 'IDLE' in the Local SSP and 'IDLE' in the Remote SSP

The TSTRC timer is not started at the Local SSP, and the TSTRC timer is started at the Remote SSP.

11.4.2.4 TSTRC timer and Call_Info_To_Resource (CITR)

The SSP receives a Call_Info_To_Resource message from the SCP in a Conversation package. If the CITR message includes a TSTRCTimer parameter, the TSTRC timer is restarted and the value of that parameter is used to determine the maximum duration of the balance of that IP connection when SOC AIN00303 is ‘ON’.

11.4.2.4.1 TSTRCTimer parameter not present

As in the case of NA015 and before, after every CITR/CIFR interaction the TSTRC timer is stopped and restarted with the value of AIN_TSTRC_TIMER in Table OFCENG. This is the case when the TSTRCTimer parameter is absent in both STR and CITR messages, regardless if the SOC AIN00303 is ‘ON’ or ‘IDLE’.

11.4.2.4.2 SOC AIN00303 is ‘ON’, TSTRCTimer present in the STR message but absent in the CITR message.

The TSTRC timer is restarted with the value of the TSTRCTimer parameter received in the STR message after every CITR/CIFR interaction.

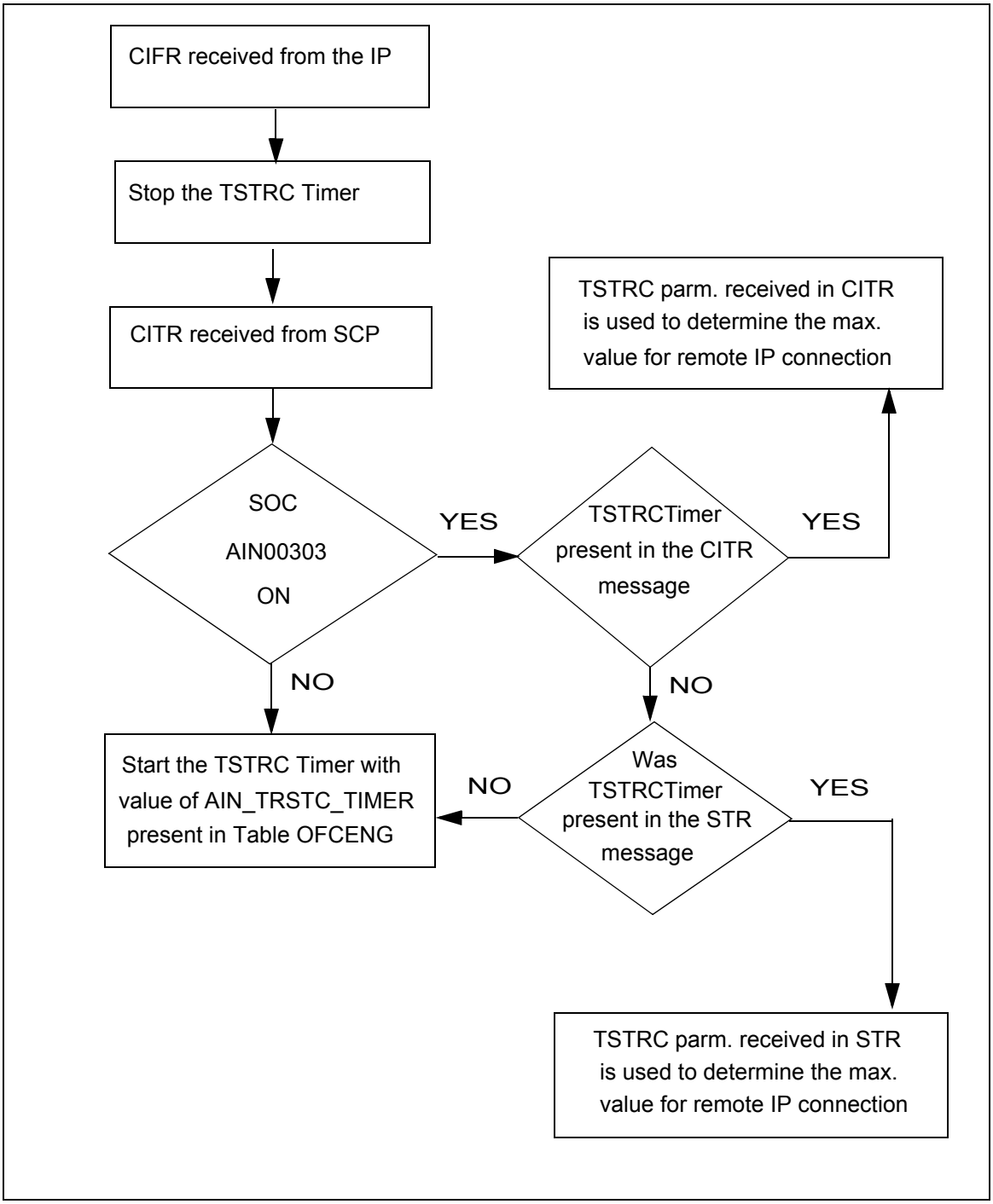
11.4.2.4.3 SOC AIN00303 is ‘ON’, TSTRCTimer present in CITR message

The TSTRC timer is restarted with the value of the TSTRCTimer parameter received in the CITR message after every CITR/CIFR interaction

11.4.2.4.4 Functional Behavior

The following figure shows the functional behavior of the STR connection timer with respect to the TSTRCTimer parameter presence in the STR message and CITR message.

Figure 64 TSTRCTimer in CITR Message and STR message



11.4.3 ISDN timers T301, T303, T310

This function covers the following functional subsets: FSS-4-6-2, FSS-4-6-4 and FSS 4-6-6.

The SSP uses the ISDN timers T301 (ISDN alerting), T303 (ISDN setup), and T310 (ISDN call proceeding) as part of the PRI protocol to the IP. These timers can be provisioned.

11.4.4 SSP-SCP interface timer (T1)

This function covers FSS-4-6-1.

Chapter 15: “STR connection to a local IP” on page 549, and Chapter 16: “STR connection to a remote IP” on page 577, document the use of the AIN T1 response timer during STR processing.

12 Generic SCP-SSP interactions for Send_To_Resource

This chapter documents FS-4-1: Generic SCP-SSP Interaction for STR.

In the message parameter tables in this chapter

- the parameters are listed alphabetically, not in the order listed in the ASN.1 format of the message.
- optional parameters have (O) after their name
- mandatory parameters have (M) after their name

12.1 STR message / Internal resource

When the destinationAddress parameter is not present in the STR message, then the SSP uses its internal resources for participant interactions.

This function covers FSS-4-1-1.

Table 131 summarizes the parameters in the Send_To_Resource message.

Table 131 Send_To_Resource message

Parameter	Description
AMAAlternateBillingNumber (O)	Functionality inherited from AIN Essentials.
AMABillingFeature (O)	
AMABusinessCustomerID (O)	Functionality inherited from AIN Essentials.
AMADigitsDialedWC (up to 5) (O)	Functionality inherited from AIN Essentials.
AMALineNumber (up to 2) (O)	Functionality inherited from AIN Essentials.
AMAMeasure (O)	See Section 6.2.2 on page 231.
AMASequenceNumber (O)	
Note: Parameters in shaded areas are not supported in this release.	

Table 131 Send_To_Resource message (Continued)

Parameter	Description
AMAServiceProviderID (O)	
AMAslpID (O)	Functionality inherited from AIN Essentials.
Amp1 (O)	
Amp2 (O)	
AnswerIndicator (O)	Functionality inherited from AIN Essentials.
DestinationAddress (O)	Functionality inherited from AIN Essentials.
DisconnectFlag (O)	Functionality inherited from AIN Essentials.
DPConverter (O)	
ExtensionParameter (O)	
PrimaryBillingIndicator (O)	Functionality inherited from AIN Essentials.
ResourceType (M)	Functionality inherited from AIN Essentials.
ServiceContext (O)	
ServiceProviderID (O)	
StrParameterBlock (M)	Functionality inherited from AIN Essentials.
TSTRCTimer (O)	STR Connection Timer
Note: Parameters in shaded areas are not supported in this release.	

For an STR message without the destinationAddress parameter, resourceType cannot be FlexParameterBlock and the STRParameterBlock cannot be encoded as a FlexParameterBlock.

An STR message without the destinationAddress parameter can be received either in a response or a conversation package.

The following rules apply to STR messages received in a response package:

- DisconnectFlag must be present.
- AnswerIndicator is or is not present.
- ResourceType must be PlayAnnouncement.
- STRParameterBlock tag must be AnnouncementBlock.

- An uninterruptible announcement must be specified (the AnnouncementBlock must be encoded as an UninterAnnounceBlock).
- The System Announcement ID within the AnnouncementBlock must be 1 to 32767.

The following rules apply to STR messages received in a conversation package:

- AnswerIndicator is or is not present.
- ResourceType can be “Play Announcement” or “Play Announcement and Collect Digits”.
- DisconnectFlag must be absent.
- When the ResourceType is Play Announcement, the STRParameterBlock tag must be AnnouncementBlock. When the ResourceType is Play Announcement and Collect Digits, the STRParameterBlock tag must be AnnouncementDigitBlock.
- The value of the MaximumDigits in the AnnouncementDigitBlock specifies the digit collection type and the number of digits to collect as specified in GR-1298-CORE, Issue 3, July 1996.
- The System Announcement ID within the AnnouncementBlock (or AnnouncementDigitBlock) must be 1 to 32767.
- When the fixed number of digits to collect is “0”, an uninterruptible announcement must be specified.
- When parameter ExtendedRinging is present, it signifies to the SSP that it should continue alerting the called party, while the caller is connected to an announcement and prompted for digit collection during STR processing.

Note: When the ResourceType is Play Announcement, this is treated as a nonfatal communication error and the SSP processes STR message as a play announcement request received in a response package by playing the announcement or tone and disconnecting the call. In this scenario, the presence or absence of the DisconnectFlag is irrelevant. This non fatal error is not reported to the SCP.

For both package types, the STRParameterBlock can specify up to 10 announcements. Only the first announcement is taken into consideration while processing the STR request and the rest are ignored.

STR messages not encoded as above are regarded as Fatal Protocol Errors. These errors are reported to the SCP in an appropriate error message, and AIN final treatment (AINF) is applied to the originating party.

12.2 STR message / External resource

This function covers FSS-4-1-2.

When either of the optional parameters, destinationAddress or STR Specific Line Attributes is present in the STR message, the calling party is connected to an intelligent peripheral (IP) and the caller interacts with resources available on the IP.

The following rules apply to STR messages with the destinationAddress parameter or STR Specific Line Attributes:

- The STR message must be received in a conversation package.
- The destination Address must be in the 10-digit national ISDN number format.
- ResourceType can be “play announcement”, “play announcement and collect digits”, or “flex parameter block”.
- STRParameterBlock can be encoded as an AnnouncementBlock, an AnnouncementDigitBlock, or a FlexParameterBlock.
- AnswerIndicator is or is not present.
- DisconnectFlag must be absent.

12.3 Resource_Clear Message / Internal resource

This function covers FSS-4-1-3.

The results related to the participant interactions with an STR message, received in a conversation package, are reported back to the SCP in a Resource_Clear message.

The Resource_Clear message can be sent either in a response package or in a conversation package, depending on the outcome of the participant interactions.

Table 132 summarizes parameters in the Resource_Clear message.

Table 132 Resource_Clear message

Parameter	Description
AMAMeasurement (O)	See Section 6.2.3 on page 233.
Amp1 (O)	
Amp2 (O)	
Note: Parameters in shaded areas are not supported in this release.	

Table 132 Resource_Clear message (Continued)

Parameter	Description
Carrier (O)	Functionality inherited from AIN Essentials.
ClearCause (M)	See Section 12.4.1 on page 496.
ClearCauseData (O)	See Section 12.4.2 on page 499.
CollectedAddressInfo (O)	Functionality inherited from AIN Essentials.
CollectedDigits (O)	Functionality inherited from AIN Essentials.
ExtensionParameter (O)	
FailureCause (O)	Functionality inherited from AIN Essentials.
IPReturnBlock (O)	See Section 12.4 on page 495.
Note: Parameters in shaded areas are not supported in this release.	

The following parameters are not applicable to the Resource_Clear message s in response to STR processing with resources internal to the SSP:

- IPReturnBlock
- ClearCauseData

12.4 Resource_Clear Message / External resource

This function also covers FSS-4-1-3.

The following parameters are not applicable to the Resource_Clear messages in response to STR processing with an IP:

- Carrier
- CollectedAddressInfo
- CollectedDigits
- FailureCause

For STR processing with an IP, the IPReturnBlock parameter contains the participant interaction results, such as collected digits, reported by the IP to the SCP. The IPReturnBlock parameter is controlled by SOC option AIN00210.

For detailed documentation on the population of the parameters in a Resource_Clear message (external resource) for different call scenarios, see Chapter 15: “STR connection to a local IP” on page 549, and Chapter 16: “STR connection to a remote IP” on page 577.

12.4.1 ClearCause

Table 133 shows possible values for the ClearCause parameter, that are explicitly set by the SSP, based on the particular call scenario. For STR with internal resources, only the values marked with an asterisk (*) are supported. For STR with an IP, when the SSP receives a Return Error component, it passes the error value (0 to 31) in this component to the SCP in the ClearCause parameter in the ResourceClear message.

This parameter is not controlled by a SOC option.

Table 133 ClearCause values

Value	Meaning	Reason	Reference
0*	normal	Normal completion of STR-Connection.	Section 15.3.2 on page 555 Section 15.4.1 on page 557 Section 16.4.1 on page 583
3*	resourceCancelled	STR-connection is cancelled at the request of the SCP.	Section 15.4.2 on page 558 Section 16.4.2 on page 585
6*	userAbandon	The user hanged up or flashed during STR-connection.	Section 15.4.3 on page 559 Section 15.5.3 on page 566 Section 16.4.3 on page 588
		Originating Agent is Attendant Console, so STR-connection is not permitted.	Not applicable
7*	invalidCode	Reported by IP	Section 15.5.8 on page 572 Section 16.5.1 on page 591
8*	failure	Reported by IP	Section 15.5.8 on page 572 Section 16.5.1 on page 591
9	channelsBusy	The D-channel or all of the B-channels to the IP are busy.	Section 15.5.2 on page 565 Section 16.5.6 on page 599
11*	resourceNotAvailable	Reported by IP	Section 15.5.8 on page 572 Section 16.5.1 on page 591
12	isdnTimeout	IP does not respond or IP does not send CONNect message.	Section 15.5.4 on page 568 Section 16.5.7 on page 601
14 *	taskRefused	Reported by IP	Section 15.5.8 on page 572 Section 16.5.1 on page 591

Table 133 ClearCause values (Continued)

Value	Meaning	Reason	Reference
16*	capabilityFailure	Reported by IP	Section 15.5.8 on page 572 Section 16.5.1 on page 591
17 *	protocolError	DISConnect message received from the IP contains a Reject component.	Section 15.4.1 on page 557 Section 15.5.1 on page 562 Section 16.5.2 on page 593 Section 16.5.8.2 on page 605
		SSP receives a PRI FACility message from the IP while waiting for a CITR message from SCP (when IP-conncected SSP is local) or ISUP FAC message from triggering SSP (when IP-connected SSP is remote) for a previously received PRI FACility message from the IP.	Section 15.5.6.1 on page 570
		The FACility message received from the IP contains a Reject component	Section 15.5.7 on page 571

Table 133 ClearCause values (Continued)

Value	Meaning	Reason	Reference
18*	abort	The DISConnect message from the IP does not have an FIE parameter.	Section 15.4.1 on page 557 Section 15.5.1 on page 562
		StrParameterBlock parameter is too big.	Section 15.5.2 on page 565
		DestinationAddress does not route to an NTNI PRI trunk.	Section 15.5.2 on page 565
		The NTNI PRI trunk specified in the DestinationAddress parameter does not have AIN_IPI_STR option in Table LTDATA.	Section 15.5.2 on page 565
		DestinationAddress translates into a Number Service Code (NSC) selector (for example 800, 888)	Not applicable
		DestinationAddress routes to a VFG or to agents other than PRI or ISUP.	Not applicable
		An equal access carrier is required to establish the STR-connection.	Not applicable
		The Return Result component in the FIE parameter received from the IP does not have a SequenceTag and Length (or improperly formatted.	Not applicable
20*	strCancelled	Reported by IP	Section 15.5.8 on page 572 Section 16.5.1 on page 591
21	temporaryFailure	Malfunctioning data link	Not applicable
22	ipTimeout	TSTRC timer expired	Section 15.4.4 on page 561 Section 16.4.4 on page 590
		TDISC timer expired	Section 15.5.5 on page 569

12.4.2 ClearCauseData

This parameter is used to convey the additional information provided by the IP, in case of an error encountered in participant interactions.

This parameter is controlled by SOC option AIN00220.

The clearCauseData parameter contains up to 17 bytes of data. (The maximum size of this parameter is 20 bytes, with 2 bytes of tag and one byte of length).

In a Local IP Configuration

When the SSP receives a Return Error component (contained in a FIE in a DISConnect message), it forms and sends the SCP/Adjunct a Resource_Clear message with a ClearCause parameter (Section 12.4.1 “ClearCause” on page 496) and, when an error parameter is included in the Return Error component of the DISConnect message, the Resource_Clear message shall have a ClearCauseData parameter that contains the error parameter. *[62]*

In a Remote IP Configuration

When the remote SSP receives a an ISDN access Facility or DISConnect message with an FIE containing a Return Error component, it forms and sends a REL message to the local SSP/intermediate switch. The REL message contains a RO parameter with a Return Error component that contains the information from the FIE's Return Error component. *[116]*

When the local SSP receives a REL message that contains a RO parameter with a Return Error component, it forms and sends the SCP/Adjunct a Resource_Clear message with a ClearCause parameter (Section 12.4.1 “ClearCause” on page 496) and, when an error parameter is included in the Return Error component of the REL message, the Resource_Clear message shall have a ClearCauseData parameter that contains the error parameter. *[117]*

12.5 Cancel_Resource_Event message

This function covers FSS-4-1-5.

The SCP can cancel a Send_To_Resource request, received in a conversation package, by sending the SSP a Cancel_Resource_Event message in a conversation package.

For STR processing with internal resources, the Cancel_Resource_Event message is valid only when the ResourceType was “play announcement and collect digits” and zero number of digits were to be collected.

The Cancel_Resource_Event message is supported, but none of its parameters are supported. See Table 134.

Table 134 Cancel_Resource_Event message

Parameter	Description
Amp1 (O)	
Amp2 (O)	
ServiceProviderID (O)	
ServiceContext (O)	
ExtensionParameter (O)	
Note: Parameters in shaded areas are not supported in this release.	

12.6 Call_Info_From_Resource message

This function covers FSS-4-1-6.

This message is used to convey intermediate results from an IP to the SCP, through the SSP, during an active STR connection.

Table 135 Call_Info_From_Resource message

Parameter	Description
IPReturnBlock (O)	See Section 12.4 on page 495.
Amp1 (O)	
Amp2 (O)	
ExtensionParameter (O)	
Note: Parameters in shaded areas are not supported in this release.	

12.7 Call_Info_To_Resource message

This function covers FSS-4-1-7.

The SCP uses this message to convey additional instructions to the IP, through the SSP, in response to a Call_Info_From_Resource message.

Table 136 Call_Info_To_Resource message

Parameter	Description
StrParameterBlock (O)	Functionality inherited from AIN Essentials.

Table 136 Call_Info_To_Resource message (Continued)

Parameter	Description
Amp1	
Amp2	
ServiceProviderID (O)	
ServiceContext (O)	
ExtensionParameter (O)	
ResourceType (O)	Functionality inherited from AIN Essentials.
TSTRCTimer (O)	STR Connection Timer
Note: Parameters in shaded areas are not supported in this release.	

13 Generic SSP-IP interactions for Send_To_Resource

This chapter documents FS-4-2, by covering the general properties of the PRI connection between the SSP and the IP, which is also referred to as the IP Interface (IPI). It also gives a detailed description of the PRI Facility Information Element (FIE) and ISUP Remote Operation (RO) parameter used in the information exchange between the SSP and the IP.

In a remote IP configuration, the connection between the remote SSP and the IP is NTNI PRI. In this configuration, the connection between the local (triggering) SSP and the remote SSP, optionally through intermediate SSP(s), is ISUP.

In a local IP configuration, the connection between the SSP and the IP is NTNI PRI.

13.1 Call originations and call control procedures for PRI IPI

This function covers the following functional subsets: FSS-4-2-1 and FSS-4-2-2.

The call control procedures used for the SSP-IP interface are according to the NTNI PRI specifications.

The SSP also supports call originations from the NTNI PRI used for the STR connections.

13.2 Supplementary service on PRI IPI

This function covers FSS-4-2-6.

The SSP does not support ISDN supplementary services if the termination on the IP is a result of an STR-IP connection.

13.3 Bearer capabilities on PRI IPI

This function covers FSS-4-2-8.

The SSP supports the following bearer capabilities for the PRI IPI:

- Circuit-Mode/Speech
- Circuit-Mode/3.1 kHz Audio
- Circuit-Mode/Unrestricted digital information (64 kbps)
- Circuit Mode/Unrestricted digital information-rate adapted from 56 kbps to 64 kbps.

13.4 Subscriptions parameters on PRI IPI

This function covers FSS-4-2-10.

The NTNI PRI to be used for STR connections must be provisioned for the AIN_IPI_STR option in table LTDATA. Otherwise, the SSP denies the STR connection and a Resource_Clear message with ClearCause=abort is returned to the SCP. See Section 10.5 “Table LTDATA” on page 356, for details.

13.5 Retriggering during STR connection

This function covers FSS-4-2-12.

Re-triggering while attempting to connect to an IP for an STR connection is not supported. Any encountered trigger is ignored.

13.6 BRI IPI

This function covers the following functional subsets:

- FSS-4-2-3
- FSS-4-2-5
- FSS-4-2-6
- FSS-4-2-9
- FSS-4-2-11

BRI IPI is not supported.

13.7 SSP/IP messaging

This section documents the ISDN Facility Information Element (FIE) and ISUP Remote Operation (RO) parameters to support the local and remote IP configurations.

The FIE and the RO parameter contain the following AIN parameters encoded in ROSE:

- ResourceType: Table 137 on page 505 shows the expected encoding of the ResourceType parameter.
- StrParameterBlock: Table 138 on page 505 shows the expected encoding of the StrParameterBlock parameter. Note that the StrParameterBlock parameter is transferred to the IP, exactly as it is received from the SCP, without checking the validity of the contents
- IPReturnBlock: Table 139 shows the expected encoding of the IPReturnBlock parameter. Note that the IPReturnBlock parameter is transferred to the SCP, exactly as it is received from the IP, without checking the validity of the contents.

Table 137 ROSE Encoded ResourceType parameter

	bit 8	7	6	5	4	3	2	bit 1	octet
Parameter Id (Octet 1) (Note)	1	0	0	1	1	1	1	1	1
Parameter Id (Octet 2)	0	0	1	0	1	1	0	1	2
Parameter Length	0	0	0	0	0	0	0	1	3
Parameter Value	0	0	0	0	0				4
Note: ResourceType parameter identifier is hexadecimal 9F2D.									

Table 138 ROSE Encoded STRParameterBlock parameter

	bit 8	7	6	5	4	3	2	bit 1	octet
Parameter Id (Octet 1) (Note)	1	0	1	1	1	1	1	1	1
Parameter Id (Octet 2)	0	0	1	1	0	0	1	0	2
Parameter Length	---------- variable ----------								3
Parameter Contents									4-n
Note: StrParameterBlock parameter identifier is hexadecimal BF32.									

Table 139 ROSE Encoded IPReturnBlock parameter

	bit 8	7	6	5	4	3	2	bit 1	octet
Parameter Id (Octet 1) (Note)		0	0	1	1	1	1	1	1
Parameter Id (Octet 2)	0	1	0	0	1	1	1	0	2
Parameter Length	---------- variable ----------								3

Table 139 ROSE Encoded IPReturnBlock parameter (Continued)

	bit 8	7	6	5	4	3	2	bit 1	octet
Parameter Contents									4-n
Note: IPReturnBlock parameter identifier is hexadecimal 9F4E.									

StrParameterBlock and IpReturnBlock enable the SCP and the IP to exchange information through the SSP(s). The maximum size of these parameters that the SSP can interwork depends on the configuration and the role of the SSP in the particular configuration.

This is illustrated in Figure 65 to Figure 68 on page 508. The sizes in bytes correspond to the maximum "length" for the parameter, followed by that many bytes of "value" for the parameter.

Figure 65 STR/IP parameter size limitations for the remote IP configuration - Triggering SSP

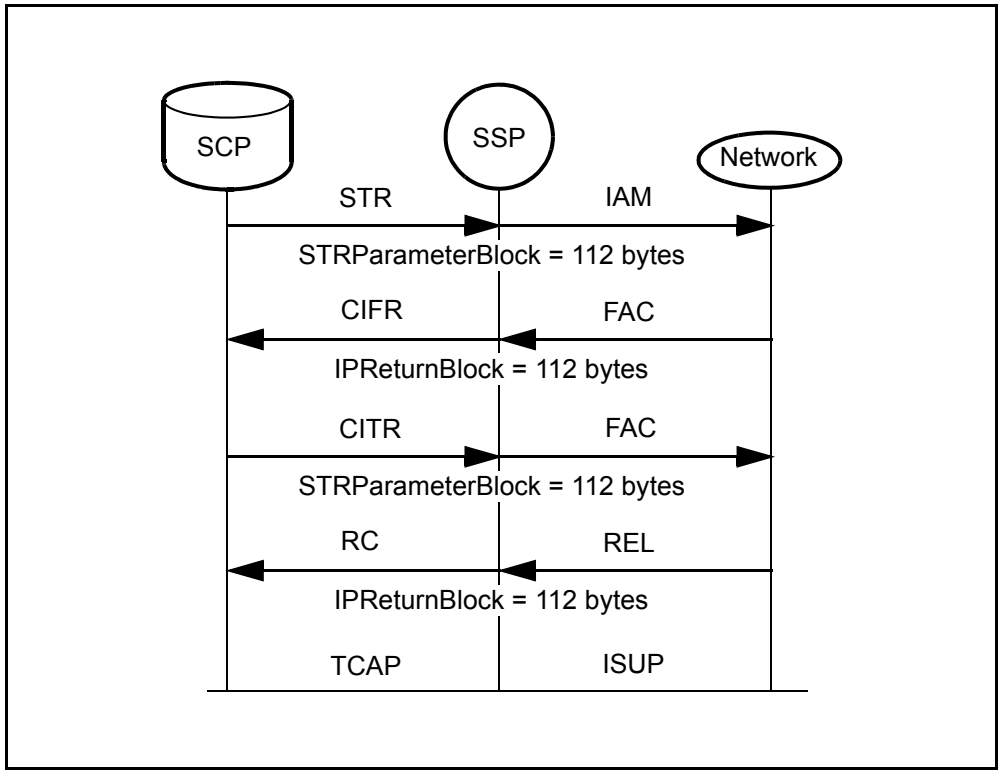


Figure 66 STR/IP parameter size limitations for the remote IP configuration - Tandem SSP

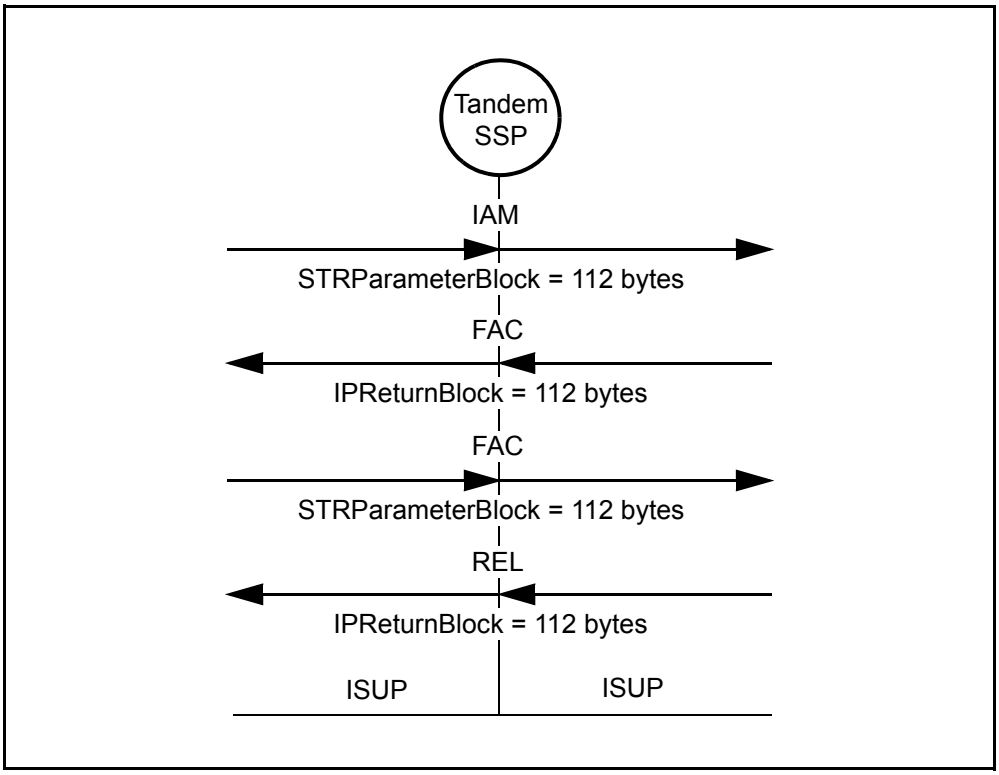


Figure 67 STR/IP parameter size limitations for the remote IP configuration - SSP connected to IP

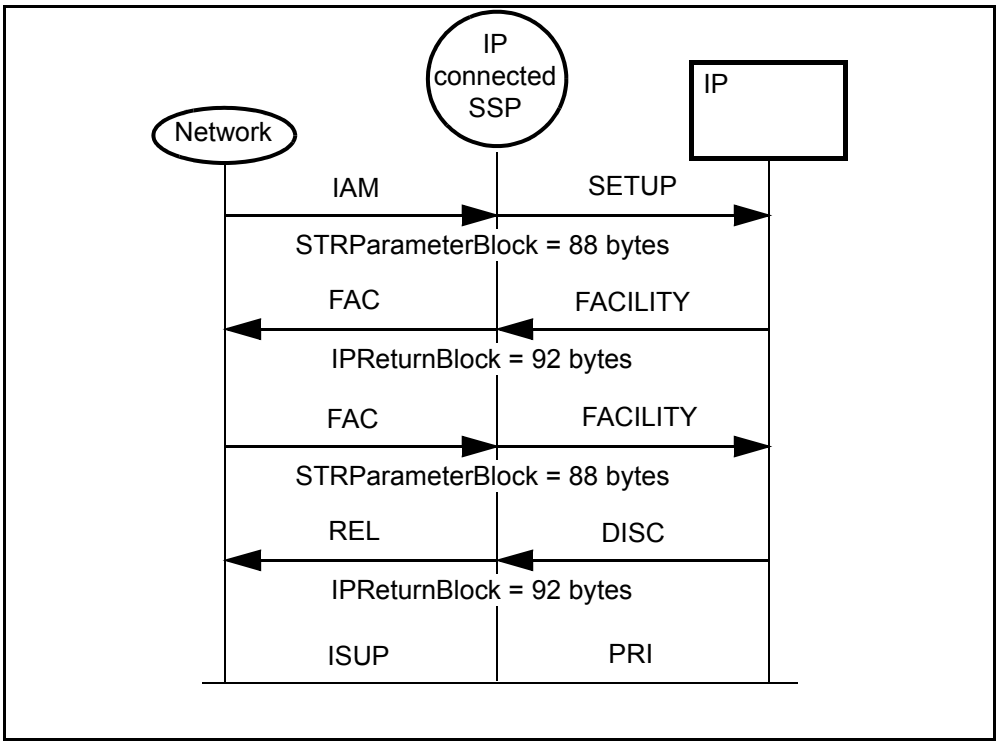
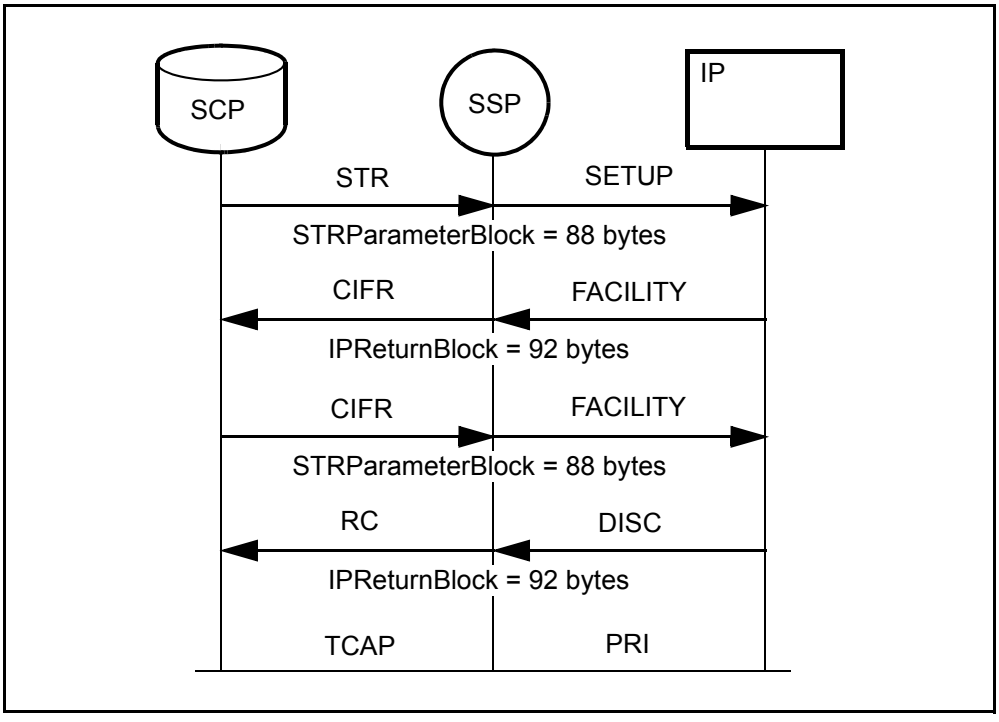


Figure 68 STR/IP parameter size limitations for the local IP configuration



The limits on the sizes of the StrParameterBlock and the IPReturnBlock are based on the following assumptions:

- The contents of the PRI SETUP message to the IP is as documented in Chapter 16: “STR connection to a remote IP” on page 577.
- The contents of the ISUP IAM message composed by the local SSP is as documented in Chapter 16: “STR connection to a remote IP” on page 577..
- The parameters in an invoke component consist of the resourceType (2 bytes tag, 1 byte length, and 1 byte value) and the STRParameterBlock (2 bytes tag, 1 byte length, and N bytes of value).
- IPReturnBlock (2 bytes tag, 1 byte length, and N bytes value) is the only parameter in a ReturnResult component.
- All the length octets in both the FIE and RO parameters use the “definite form”. (For more information on the “definite form” see Section 6.3.3 of ITU-T X.209, *Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1)*.

13.7.1 Facility information element

The layout of bits and octets in the Facility Information Element (FIE) is shown in Table 140.

Table 140 Facility information element (FIE)

Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Octet
0	0	0	1	1	1	0	0	1
Length of information element								2
Service discriminator (Note)								3
User data (component)								4..n
Note: Service discriminator—no service ID = (91)hex								

The user data components in the FIE are:

- Invoke component
- Return Error component
- Return Result component
- Reject component

The layouts of the above components are shown in Table 141 on page 510 through Table 144 on page 513.

Table 141 Invoke component of the FIE

	bit 8	7	6	5	4	3	2	bit 1	octet
Component Tag	1	0	1	0	0	0	0	1	4
Component Length (Note 1)	---------- variable ----------								5
Invoke Identifier Tag	0	0	0	0	0	0	1	0	6
Invoke Identifier Length	0	0	0	0	0	0	0	1	7
Invoke Identifier	0	0	0	0	0	0	0	1	8
Operation Value Tag	0	0	0	0	0	1	1	0	9
Operation Value Length	0	0	0	0	0	1	1	0	10
Operation Value 1	0	0	1	0	1	0	1	1	11
Operation Value 2	0	0	0	1	0	0	0	1	12
Operation Value 3	0	1	1	0	1	0	0	1	13
Operation Value 4	0	0	0	0	0	0	1	0	14
Operation Value 5	0	0	0	0	0	0	0	1	15
Operation Value 6	0	0	0	0	0	0	0	1	16
Sequence Tag	0	0	1	1	0	0	0	0	17
Sequence Length	---------- variable ----------								18
Resource Type Tag 1	1	0	0	1	1	1	1	1	19
Resource Type Tag 2	0	0	1	0	1	1	0	1	20
Resource Type Length	0	0	0	0	0	0	0	1	21
Resource Type	---------- variable ----------								22
StrParameterBlock Tag 1	1	0	1	1	1	1	1	1	23
StrParameterBlock Tag 2	0	0	1	1	0	0	1	0	24
StrParameterBlock Length	---------- variable ----------								25
StrParameterBlock (Note 2)									26-n

Table 141 Invoke component of the FIE (Continued)

	bit 8	7	6	5	4	3	2	bit 1	octet
Note 1: Note 1: The maximum value that bits 1 to 7 can take is 108. ***Note 2:*** The maximum size is 88 bytes									

Table 142 Return Result component of the FIE

	bit 8	7	6	5	4	3	2	bit 1	octet
Component Tag	1	0	1	0	0	0	1	0	4
Component Length (Note 1)	---------- variable ----------								5
Invoke Identifier Tag	0	0	0	0	0	0	1	0	6
Invoke Identifier Length	0	0	0	0	0	0	0	1	7
Invoke Identifier	0	0	0	0	0	0	0	1	8
Sequence Tag (Note 2)	0	0	1	1	0	0	0	0	9
Sequence Length (Note 2)	---------- variable ----------								10
Operation Value Tag (Note 2)	0	0	0	0	0	1	1	0	11
Operation Value Length (Note 2)	0	0	0	0	0	1	1	0	12
Operation Value 1 (Note 2)	0	0	1	0	1	0	1	1	13
Operation Value 2 (Note 2)	0	0	0	1	0	0	0	1	14
Operation Value 3 (Note 2)	0	1	1	0	1	0	0	1	15
Operation Value 4 (Note 2)	0	0	0	0	0	0	1	0	16
Operation Value 5 (Note 2)	0	0	0	0	0	0	0	1	17
Operation Value 6 (Note 2)	0	0	0	0	0	0	0	1	18
Sequence Tag (Note 2)	0	0	1	1	0	0	0	0	19
Sequence Length (Note 2)	---------- variable ----------								20
IP Return Block Tag 1 (Note 2)	1	0	0	1	1	1	1	1	21
IP Return Block Tag 2 (Note 2)	0	1	0	0	1	1	1	0	22
IP Return Block Length (Note 2)	---------- variable ----------								23
IP Return Block (Note 2 and Note 3)									24-n
Note 1: The maximum value that bits 1 to 7 can take is 110. ***Note 2:*** Included if any results are returned. ***Note 3:*** The maximum size is 92 bytes.									

Table 143 Return Error component of the FIE

	bit 8	7	6	5	4	3	2	bit 1	octet
Component Tag	1	0	1	0	0	0	1	1	4
Component Length (Note 1)	---------- variable ----------								5
Invoke Identifier Tag	0	0	0	0	0	0	1	0	6
Invoke Identifier Length	0	0	0	0	0	0	0	1	7
Invoke Identifier	0	0	0	0	0	0	0	1	8
Error Value Tag	0	0	0	0	0	1	1	0	9
Error Value Length	0	0	0	0	0	1	1	0	10
Error Value1	0	0	1	0	1	0	1	1	11
Error Value2	0	0	0	1	0	0	0	1	12
Error Value3	0	1	1	0	1	0	0	1	13
Error Value4	0	0	0	0	0	0	1	0	14
Error Value5	0	0	0	0	0	0	0	1	15
Error Value6	---------- variable ----------								16
Parameter Tag (Note 2)	0	0	0	0	0	1	0	0	17
Parameter Length (Note 2)	---------- variable ----------								18
Parameter (Note 2 and Note 3)									19-n

Note 1: The maximum value that bits 1 to 7 can take is 33.

Note 2: Parameter can be included only if the Error Code is taskRefused(that is, ErrorValue6 has hexadecimal value 0E)

Note 3: The maximum size is 20 bytes.

Table 144 Reject component of the FIE

	bit 8	7	6	5	4	3	2	bit 1	octet
Component Tag	1	0	1	0	0	1	0	0	4
Component Length (Note)	---------- variable ----------								5
Invoke Identifier Tag	0	0	0	0	0	0	1	0	6
Invoke Identifier Length	0	0	0	0	0	0	0	1	7
Invoke Identifier	0	0	0	0	0	0	0	1	8
Problem Tag	1	0	0	0	0	0	variable		9
Problem Length	0	0	0	0	0	0	0	1	10
Problem	---------- variable ----------								11
Note: The maximum value that bits 1 to 7 can take is 39.									

13.7.2 Remote operations parameter

The layout of bits and octets in the Remote Operations (RO) parameter is shown in Table 145.

Table 145 Remote Operations (RO) parameter

bit 8	7	6	5	4	3	2	bit 1	octet
Parameter ID = 00110010 (#32)								1
Parameter Length								2
Ext	Spare		Protocol Profile (Note)					3
Component								4-n
Note: Protocol Profile = 1 0 0 0 1								

The components in the RO parameter are:

- Invoke component
- Return Result component
- Return Error component
- Reject component

The layouts of the above components are shown in Table 146 on page 514 through Table 149 on page 517.

Table 146 Invoke component of the RO

	bit 8	7	6	5	4	3	2	bit 1	octet
Component Tag	1	0	1	0	0	0	0	1	4
Component Length (Note 1)	---------- variable ----------								5
Invoke Identifier Tag	0	0	0	0	0	0	1	0	6
Invoke Identifier Length	0	0	0	0	0	0	0	1	7
Invoke Identifier	0	0	0	0	0	0	0	1	8
Operation Value Tag	0	0	0	0	0	1	1	0	9
Operation Value Length	0	0	0	0	0	1	1	0	10
Operation Value 1	0	0	1	0	1	0	1	1	11
Operation Value 2	0	0	0	1	0	0	0	1	12
Operation Value 3	0	1	1	0	1	0	0	1	13
Operation Value 4	0	0	0	0	0	0	1	0	14
Operation Value 5	0	0	0	0	0	0	0	1	15
Operation Value 6	0	0	0	0	0	0	0	1	16
Sequence Tag	0	0	1	1	0	0	0	0	17
Sequence Length	---------- variable ----------								18
Resource Type Tag 1	1	0	0	1	1	1	1	1	19
Resource Type Tag 2	0	0	1	0	1	1	0	1	20
Resource Type Length	0	0	0	0	0	0	0	1	21
Resource Type	---------- variable ----------								22
StrParameterBlock Tag 1	1	0	1	1	1	1	1	1	23
StrParameterBlock Tag 2	0	0	1	1	0	0	1	0	24
StrParameterBlock Length	---------- variable ----------								25
StrParameterBlock (Note 2)									26-n

Table 146 Invoke component of the RO (Continued)

	bit 8	7	6	5	4	3	2	bit 1	octet
Note 1: The maximum value that bits 1 to 7 can take is 127. If the component is larger than 127, then the octet is set to "10000001" and a second octet is used to specifiy the component length. The maximum component length is 132. ***Note 2:*** The maximum size is 112 bytes.									

Table 147 Return Result component of the RO

	bit 8	7	6	5	4	3	2	bit 1	octet
Component Tag	1	0	1	0	0	0	1	0	4
Component Length (Note 1)	---------- variable ----------								5
Invoke Identifier Tag	0	0	0	0	0	0	1	0	6
Invoke Identifier Length	0	0	0	0	0	0	0	1	7
Invoke Identifier	0	0	0	0	0	0	0	1	8
Sequence Tag (Note 2)	0	0	1	1	0	0	0	0	9
Sequence Length (Note 2)	---------- variable ----------								10
Operation Value Tag (Note 2)	0	0	0	0	0	1	1	0	11
Operation Value Length (Note 2)	0	0	0	0	0	1	1	0	12
Operation Value 1 (Note 2)	0	0	1	0	1	0	1	1	13
Operation Value 2 (Note 2)	0	0	0	1	0	0	0	1	14
Operation Value 3 (Note 2)	0	1	1	0	1	0	0	1	15
Operation Value 4 (Note 2)	0	0	0	0	0	0	1	0	16
Operation Value 5 (Note 2)	0	0	0	0	0	0	0	1	17
Operation Value 6 (Note 2)	0	0	0	0	0	0	0	1	18
Sequence Tag (Note 2)	0	0	1	1	0	0	0	0	19
Sequence Length (Note 2)	---------- variable ----------								20
IP Return Block Tag 1 (Note 2)	1	0	0	1	1	1	1	1	21
IP Return Block Tag 2 (Note 2)	0	1	0	0	1	1	1	0	22
IP Return Block Length (Note 2)	---------- variable ----------								23

Table 147 Return Result component of the RO (Continued)

	bit 8	7	6	5	4	3	2	bit 1	octet
IP Return Block (Note 2 and Note 3)									24-n
Note 1: The maximum value that bits 1 to 7 can take is 127. If the component is larger than 127, then the octet is set to “10000001” and a second octet is used to specifiy the component length. The maximum component length is 132. ***Note 2:*** Included if any results are returned. ***Note 3:*** The maximum size is 112 bytes.									

Table 148 Return Error component of the RO

	bit 8	7	6	5	4	3	2	bit 1	octet
Component Tag	1	0	1	0	0	0	1	1	4
Component Length (Note 1)	---------- variable ----------								5
Invoke Identifier Tag	0	0	0	0	0	0	1	0	6
Invoke Identifier Length	0	0	0	0	0	0	0	1	7
Invoke Identifier	0	0	0	0	0	0	0	1	8
Error Value Tag	0	0	0	0	0	1	1	0	9
Error Value Length	0	0	0	0	0	1	1	0	10
Error Value1	0	0	1	0	1	0	1	1	11
Error Value2	0	0	0	1	0	0	0	1	12
Error Value3	0	1	1	0	1	0	0	1	13
Error Value4	0	0	0	0	0	0	1	0	14
Error Value5	0	0	0	0	0	0	0	1	15
Error Value6	---------- variable ----------								16
Parameter (Note 2)									18 - n
Note 1: The maximum value that bits 1 to 7 can take is 31. ***Note 2:*** The maximum size is 20 bytes.									

Table 149 Reject component of the RO

	bit 8	7	6	5	4	3	2	bit 1	octet
Component Tag	1	0	1	0	0	1	0	0	4
Component Length (Note 1)	---------- variable ----------								5
Invoke Identifier Tag	0	0	0	0	0	0	1	0	6
Invoke Identifier Length	0	0	0	0	0	0	0	1	7
Invoke Identifier	0	0	0	0	0	0	0	1	8
Problem Tag	1	0	0	0	0	0	variable		9
Problem Length	0	0	0	0	0	0	0	1	10
Problem	---------- Value: Context Sensitive----------								11
Note: The maximum value that bits 1 to 7 can take is 39.									

13.7.2.1 Processing multiple RO parameters

If there are more than one RO parameter in an IAM/FAC/REL message, the first one with the recognized operation code is processed and the rest is ignored.

If no RO parameter with the recognized operation code is found in an IAM message, a SETUP message without an RO parameter is sent to the IP.

If no RO parameter with the recognized operation code is found in a FAC, the message is not processed. This is noncompliant to (R) 5-44 [124] in GR-1129-CORE, Issue 2.

14 STR processing with an SSP resource

After receiving an O_No_Answer (O_NoA) query or T_No_Answer (T_NoA) query from the service switching point (SSP) for a given call, the service control point (SCP)/adjunct can return a Send_To_Resource (STR) message. The STR message instructs the DMS-100 SSP to play an announcement or a tone to the originating party, and optionally collect digits.

For datafilling information, see Chapter 48,“Send_To_Resource response”.

14.1 General

The STR message can be processed using resources either internal to or external to the SSP. When the destinationAddress parameter is in the STR message then the announcement and/or digit collection should be applied using external resources. The absence of parameter destinationAddress in the STR message implies that the STR request is to be processed using the resources internal to the SSP.

The STR message can come in a response package or in a conversation package. As a response message, STR can play an announcement to the originator. As a conversation package, it can both play an announcement and collect digits.

For internal resources, the STR message can come both in a response package or in a conversation package. For external resources, the STR message can only come in a conversation package.

When digit collection takes place, the tones and announcements can be specified as either non interruptible or interruptible. When digit collection does not take place, tones and announcements are, by default, non interruptible.

Depending on the package type (response or conversation) of the STR message, the following forms of user interactions are supported:

- In a response package, the DMS-100 SSP plays the specified tone, standard announcement, or customized announcement to completion and disconnects the call.

  Note 1: A standard announcement is one with ANNTYPE=STND in table ANNS. It can be played for more than one user simultaneously.

  Note 2: A customized announcement is one with ANNTYPE=AIN in table ANNS. It can only be played for one user at a time. Customized announcements also allow pronouncing the digits provided by the SCP, in an STR message.

- In a conversation package, the DMS-100 SSP plays the specified tone, or standard announcement, or customized announcement. When digit collection is requested, the DMS-100 SSP collects digits. The SSP reports the result of the operation (optionally with collected digits) to the SCP in a Resource_Clear message. While the STR request is being processed at the SSP, the SCP can cancel the STR request by sending a Cancel_Resource_Event message to the SSP in a conversation package. Cancel_Resource_Event is only valid when the STR message arrives in a conversation package, specifies non-interruptible announcements or tones, and collects no digits.

When fatal errors are encountered during STR processing, the DMS-100 SSP reports these errors to the SCP, either in an Application_Error or a Report_Error message.

14.2 Send_To_Resource processing

14.2.1 Send_To_Resource message in a response package

When the STR message is received in a response package, the specified tone, custom announcement, or standard announcement is played to completion and the call is taken down by applying a disconnect timeout treatment to the originating party.

Fatal errors encountered while processing an STR message received in a response package are reported back to the SCP in a Report_Error message as described in Section 14.13 “Reporting Send_To_Resource results and errors” on page 541.

14.2.2 Send_To_Resource message in a conversation package

When the STR message is received in a conversation package, the STR request can include digit collection. In this case, the SCP can request a specified tone, a standard announcement, or a custom announcement to be played prior to digit collection. This prompt can be non-interruptible (played to completion

before allowing any digit collection), or interruptible (the prompt is interrupted upon the receipt of the first digit).

The following three digit collection methods are supported for an STR request:

- Fixed digit collection specifies a number of digits between 0 and 32 for collection.
- Variable digit collection allows up to 32 digits to be collected.
- Normal digit collection collects digits based on the dial plan of the originating party.

The collected digits are reported back to the SCP in a Resource_Clear message. This message is sent from the SSP to the SCP in a conversation package and the transaction between the SSP and the SCP remains open.

When digit collection fails, the SSP sends a Resource_Clear or an Application_Error message to the SCP, indicating the failure reason. The Resource_Clear message is sent in either a response or a conversation package, depending on the failure scenario. Section 14.13 “Reporting Send_To_Resource results and errors” on page 541 provides a detailed list of all possible success and failure scenarios applicable to processing a Send_To_Resource message and the action(s) taken for each scenario.

The SCP can cancel a Send_To_Resource request that is received in a conversation package, by sending the SSP a Cancel_Resource_Event message. This is valid only in certain scenarios as documented in Section 14.8 “Processing the Cancel_Resource_Event message” on page 531.

14.3 Send_To_Resource message

14.3.1 Send_To_Resource parameter block

Figure 69 on page 522 illustrates the GR-1299 ASN.1 definition of the StrParameterBlock parameter.

Figure 69 GR-1299 ASN.1 definition of the StrParameterBlock parameter

```
StrParameterBlock::=[50] CHOICE {
        [0] IMPLICIT AnnouncementBlock,        --for Play Announcements
                                               --resource type
        [1] IMPLICIT AnnouncementDigitBlock,   --for Play Announcement and
                                               --Collect Digits resource type
        [2] IMPLICIT FlexParameterBlock        -- Only for External IP
                                               -- connections
        }

FlexParameterBlock::=OCTET STRING

AnnouncementBlock::=SEQUENCE {
        [1] IMPLICIT UninterAnnounceBlock      OPTIONAL,
        [2] IMPLICIT InterAnnounceBlock        OPTIONAL
        }
AnnouncementDigitBlock::=SEQUENCE {
        [0] IMPLICIT MaximumDigits,
        [1] IMPLICIT UninterAnnounceBlock      OPTIONAL,
        [2] IMPLICIT InterAnnounceBlock        OPTIONAL
        }

UninterAnnounceBlock::=SEQUENCE OF AnnounceElement

InterAnnounceBlock::=SEQUENCE OF AnnounceElement

MaximumDigits::=INTEGER(0..255)
--range: 0-32 is “Fixed number of digits” (e.g. 5 means collect 5 digits)
--33-252 is spare
--253 is “Normal number of digits” (i.e. specifies Normal Digit Collection)
--254 is “Any number of digits” (i.e. specifies Variable Digit Collection)
--255 is spare

AnnounceElement::=OCTET STRING
```

Table 150 provides an encoding example for the AnnouncementElement.

Table 150 AnnouncementElement encoding example

H	G	F	E	D	C	B	A
System Announcement ID (most significant octet)							
Note: The most significant digit is sent first. Subsequent digits are sent in successive 4-bit fields.							

Table 150 AnnouncementElement encoding example (Continued)

H	G	F	E	D	C	B	A
System Announcement ID (least significant octet)							
Number of Info Digits							
2nd Info Digit				1st Info Digit			
Nth Info Digit				N-1st Info Digit			
Note: The most significant digit is sent first. Subsequent digits are sent in successive 4-bit fields.							

Parameter STRParameterBlock is encoded as an AnnouncementBlock, when the SCP requests playing an announcement (or a tone) only. When digit collection is also required, parameter STRParameterBlock must be encoded as an announcement digit block. In this case, the MaximumDigits field specifies the requested digit collection type and the number of digits to collect as described above.

An announcement element specifies an announcement or a tone to be played to the user. It can also contain the “Info Digits” to be pronounced as a variable phrase within the announcement.

Upon receiving an STR message, the SSP plays only one announcement (or tone) to the user. When this announcement (or tone) is to be played to completion, the announcement element should be encoded as an UninterAnnounceBlock. When it is to be played as a digit collection prompt, it should be encoded as an InterAnnounceBlock. The SSP plays only the first announcement (or tone) specified in parameter STRParameterBlock and ignores the rest.

The following rules apply to STR messages received in a response package:

- AnswerIndicator is or is not present.
- DisconnectFlag must be present.
- ResourceType must be PlayAnnouncement.
- STRParameterBlock tag must be AnnouncementBlock.

- An non-interruptible announcement must be specified (the AnnouncementBlock must be encoded as an UninterAnnounceBlock).
- The system announcement ID (within the AnnouncementBlock) must be 1 to 32767.

  Note: The GR-1298-CORE specifies the range for the announcement IDs as 1-511. The DMS-100 SSP supports this larger range to meet customer needs.

Rules that apply to STR messages that are received in a conversation package are as follows:

- AnswerIndicator is or is not present.
- DisconnectFlag must be absent.
- ResourceType can be “Play Announcement” or “Play Announcement and Collect Digits”.

  Note: When the ResourceType is play announcement, this is treated as a non-fatal communication error and the SSP processes the STR message as a play announcement request received in a response package, by playing the announcement or tone and disconnecting the call. In this scenario, the presence or absence of the DisconnectFlag is irrelevant. This non-fatal error is not reported to the SCP.

- When the ResourceType is play announcement, the STRParameterBlock tag must be AnnouncementBlock. When the ResourceType is play announcement and collect digits, the STRParameterBlock tag must be AnnouncementDigitBlock.
- The system announcement ID within the AnnouncementBlock (or AnnouncementDigitBlock) must be 1 to 32767.
- The value of the MaximumDigits in the AnnouncementDigitBlock specifies the digit collection type and the number of digits to collect as specified in the ASN.1 definition above.
- When the fixed number of digits to collect is “0”, an non-interruptible announcement must be specified.

For both package types, the STRParameterBlock can specify up to ten announcements. Only the first announcement is taken into consideration, while processing the STR request, and the rest are ignored.

14.4 Announcements and tones

14.4.1 Standard announcements

DMS-100 SSP standard announcements are datafilled in table ANNS and are mapped to the system announcement ID in table AINANNS. Standard

announcements are those datafilled in table DRAMTRK and are accessible by multiple users.

14.4.2 Customized announcements

DMS-100 SSP customized announcements are datafilled in tables ANNS and DRMUSERS and are mapped to the system announcement ID in table AINANNS. Customized announcements are only accessed one user at a time.

Customized announcements can be provisioned to contain a variable phrase. This allows the SCP to provide the digits to be pronounced within the announcement, as part of the Send_To_Resource message. Each customized announcement can contain one variable phrase. Up to 30 digits can be pronounced as a variable phrase in a customized announcement.

14.4.3 Tones

Supported tones for Send_To_Resource are described in Table 151.

Table 151 Tones for Send_To_Resource

Tone	System Announce. ID	Supported scenarios		
		Response package	Conversation package	
			Inter. Ann. Blk	Uninter. Ann. Blk
Silent Tone	5	YES	YES	NO
Special Dial Tone	6	YES	YES	NO
Confirmation Tone	12	YES	NO	YES
Reorder Tone	13	YES	NO	NO
Dial Tone	14	YES	YES	NO

Note 1: A NO indicates that the tone is not supported in the particular context (for example, as interruptible); in this case the call is sent to AINF treatment and an Application_Error message is sent back to the SCP.

Note 2: The system announcement IDs are reserved for tones that are fixed and cannot be provisioned.

14.4.4 General Information

In table ANNS, setting the CYTIME to 0 (zero) on an announcement will play that announcement for the length of the announcement and then stop. It is not necessary to put the length of the announcement in the field. When the CYTIME in table ANNS is set to 0 (zero), the DRAMREC record is ignored and the actual announcement length is used.

Announcement type AIN is considered a customer announcement. The announcement plays correctly with the AIN announcement type and CYTIME set to 0 (zero). Maxcycle should be set to 1. You can collect digits and flash.

0 (zero) should never be entered in field CYTIME for STDN service announcements if digit collection is desired since entering 0 (zero) in this field with announcement type STDN allows for flexible announcement timing. Flexible announcement timing does not support digit collection and therefore may be undesirable when used with certain DMS features.

14.4.5 Arbitration in system announcement ID mapping

The same system announcement ID range (1 to 32767) is used for announcements and tones, and the following mapping rule applies. When a system announcement ID that is reserved for tones is datafilled against an announcement in table AINANNS, the system announcement ID is mapped to the announcement and the STR request is processed (as documented in section 14.2, “Send_To_Resource processing”).

14.5 Digit collection for Send_To_Resource

Digit collection can be performed using one of the following three methods: fixed, variable, or normal digit collection.

Note: When digit collection takes place after playing an non-interruptible announcement, the DMS-100 SSP plays “stuttered dial-tone” as the digit collection prompt.

14.5.1 Fixed digit collection

The fixed digit collection method is as follows:

- A fixed number of digits (0 to 32) are collected from the originating party.
- Normal interdigit timing is applied before and after the first digit.
- Digit collection ends after collecting the required number of digits
- The ClearCause value (in the resource clear message) is set to “Normal” when the required number of digits are collected successfully.
- When a time-out occurs, or when the user presses the “#” button during digit collection the ClearCause value is set to “InvalidCode”. Collected digits are still sent to the SCP in parameter CollectedDigits in the Resource_Clear message.

14.5.2 Variable digit collection

The variable digit collection method is as follows:

- A variable number of digits, between 0 and 32, are collected from the originator.
- Normal interdigit timing is applied before and after the first digit.

- Digit collection ends
  - — on a time-out
  - — at an end-of-dialing indication,"#"
  - — when collecting a maximum number of digits (32)
- The ClearCause value (in the resource clear message) is set to "normal".

14.5.3 Normal digit collection

The normal digit collection method is as follows:

- Up to 32 digits are collected from the originator based on the dialing plan of the originating party.
- Normal interdigit timing is applied before and after the first digit.
- Critical time-out is applied after receiving a potentially complete code.
- Digit collection ends when a complete sequence of digits is collected.
- The ClearCause value (in the resource clear message) is set to "normal".
- When a time-out occurs, or when the user presses the "#" button during digit collection, the ClearCause value is set to "InvalidCode". Collected digits are still sent to the SCP in parameter CollectedDigits in the Resource_Clear message.

14.5.4 Processing the restart digit

During fixed or variable digit collection, a "*" is always treated as a restart digit. Whenever a "*" is received, any previously received digits, including the "*", are discarded and Send_To_Resource processing restarts by playing the specified announcement or tone from the beginning.

14.6 Send_To_Resource processing for analog lines

For lines, Send_To_Resource processing is performed as documented in the above sections. The announcement or tone is played inband and the digits are collected as either dual-tone multifrequency (DTMF) or digit pulse (DP).

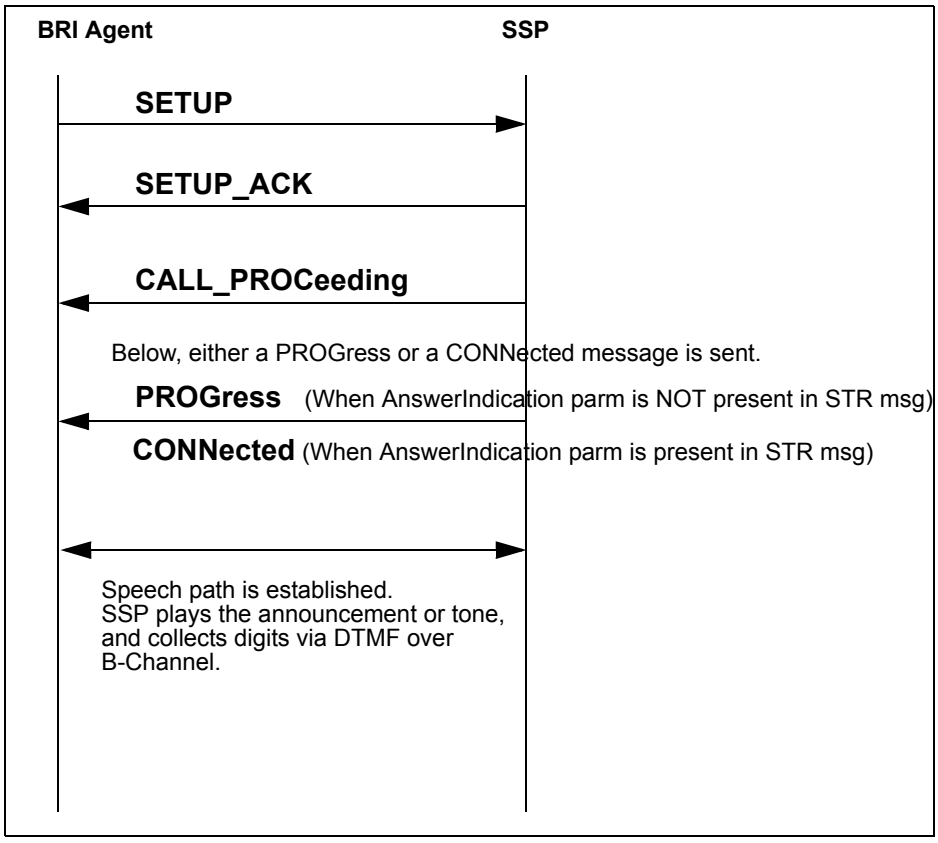
For STR messages received in a response package with parameter AnswerIndicator present, the AMA timer is started when the tone or the announcement begins. This timer value is also used in the Termination_ Notification message.

14.7 Send_To_Resource processing for ISDN-BRI

Only in-band (B-channel) digit collection, as specified in Bellcore GR-1298, is supported for ISDN-BRI agents. Out-of-band (D-channel) digit collection using ISDN information request (IRQ) procedures is not supported.

Figure 70 “STR processing for ISDN-BRI” on page 528 illustrates the sequence of messages exchanged between the DMS-100 switch and the BRI customer premises equipment (CPE). The conditions that apply to each message are listed on the right side.

Figure 70 STR processing for ISDN-BRI



STR processing for ISDN-BRI agents (as illustrated in Figure 70) is as follows:.

1. The SETUP ACK message associates a B-channel with the call.
2. The CALL_PROCeeding message is always sent, when it has not already been sent prior to processing the STR response. The digit collection mode switches to in-band after this message is sent.
3. The PROGress message is sent (when it has not already been sent prior to processing the STR response) when an non-interruptible announcement is specified and the AnswerIndication is not present. The progress indicator information element (IE) in the message is set to “inband information or appropriate pattern now available”. An end-to-end speech path is established in both directions.

4. The CONNected message is sent (when it has not already been sent prior to processing the STR response) when the AnswerIndication is present. In this case, there is no need to send the PROGress message. Again, an end-to-end speech path is established in both directions.
5. The announcement or tone is played in-band.
6. Digits are collected using DTMF over the B-channel, based on the characteristics of the bearer capability selected for the call.

   Note: The applicable interdigit timing and the detection of the completion of digit collection are as documented in Section 14.5 “Digit collection for Send_To_Resource” on page 526.

The following sections describe the STR functionality for ISDN-BRI in detail. In all cases, when a particular message is specified, it is assumed that a message has not already been sent.

14.7.1 Send_To_Resource processing in a response package

Send_To_Resource processing in a response package is as follows:

1. A CALL PROCeeding message is sent.
2. When AnswerIndication is absent a PROGress message with the progress indicator IE set to “inband information or appropriate pattern now available” is sent.
   When AnswerIndication is present a CONNected message is sent and the AMA timer is started.
3. The announcement or the tone is played to completion.
4. The call is disconnected by applying disconnect timeout treatment.

   Note: Failure cases are listed in Section 14.13 “Reporting Send_To_Resource results and errors” on page 541.

14.7.2 Send_To_Resource processing in a conversation package

In this section Send_To_Resource processing in a conversation package is described for three separate scenarios.

14.7.2.1 Playing an announcement or a tone and collecting zero digits

The process for playing an announcement or a tone and collecting zero digits is as follows:

1. A CALL PROCeeding message is sent.
2. Previously received digits are discarded.
3. When AnswerIndication is absent a PROGress message with the progress indicator IE set to “inband information or appropriate pattern now

available" is sent.
When AnswerIndication is present a CONNected message is sent.

4. The tone or announcement is played inband to completion.
5. A Resource_Clear message reporting successful completion is sent to the SCP.

> ***Note:*** Failure cases are listed in Section 14.13 "Reporting Send_To_Resource results and errors" on page 541.

14.7.2.2 Playing an non-interruptible announcement or tone and collecting digits

The process for playing an non-interruptible announcement or tone and collecting digits is as follows:

1. A CALL PROCeeding message is sent.
2. Previously received digits are discarded.
3. When AnswerIndication is absent a PROGress message with the progress indicator IE set to "inband information or appropriate pattern now available" is sent.
   When AnswerIndication is present, a CONNected message is sent.
4. The tone or announcement is played inband to completion.
5. Digit collection is started.
6. When a restart digit is received, previously collected digits are discarded and the prompt is replayed.
7. When digit collection completes successfully, a Resource_Clear message with Collected_Digits (or with CollectedAddressInfo, in case of normal digit collection) is sent.

> ***Note:*** Failure cases are listed in Section 14.13 "Reporting Send_To_Resource results and errors" on page 541.

14.7.2.3 Playing an interruptible announcement or tone and collecting digits

In this process buffered digits are checked as follows:

1. When the buffered digits are sufficient to complete digit collection, the tone is not played and the collected digits are reported to the SCP in a Resource_Clear message.
2. When there are buffered digits, but they are not sufficient to complete digit collection, the buffered digits are discarded and processing continues as documented below.
3. When there are no buffered digits, processing continues.

   Note: Only silent tone and special dial tone are allowed for this case.

The process for playing an interruptible announcement or a tone and collecting digits is as follows:

1. A CALL PROCeeding message is sent.
2. When AnswerIndication is absent, a PROGress message with the progress indicator IE set to “inband information or appropriate pattern now available” is sent.
3. The tone or announcement is played inband.
4. Digit collection is started.
5. When a restart digit is received, previously collected digits are discarded and the tone is replayed.
6. When digit collection completes successfully, A Resource_Clear message with Collected_Digits (or with CollectedAddressInfo, in case of normal digit collection) is sent.

   Note: Failure cases are listed in Section 14.13 “Reporting Send_To_Resource results and errors” on page 541.

14.8 Processing the Cancel_Resource_Event message

When the SCP transmits a Send_To_Resource message in a conversation package, and requests a non-interruptible prompt and to collect 0 digits, the SCP can later ask the SSP to cancel this request by sending a Cancel_Resource_Event message in a conversation package.

Upon satisfying this request, the SSP sends the SCP a Resource_Clear message with the ClearCause set to “ResourceCancelled”.

The SSP ignores a Cancel_Resource_Event message, when it arrives after the SSP sends a Resource_Clear message to the SCP to report the completion of processing the STR request (race condition).

The SSP treats a Cancel_Resource_Event request received at any other time than when it is expected, as a fatal unexpected message error and provides AINF treatment.

14.9 Extended Ringing

The SCP can request the Extended Ringing capability of the SSP by including the parameter in the STR conversation package. This parameter indicates to the SSP that it must continue alerting the called party while the caller is connected to an announcement and prompted for digit collection during STR processing. When the called party answers, the announcement played to the calling party is cancelled and a connection between the calling and called party is made.

14.9.1 Internal STR-ER

For internal STR-ER, the STR message must be received in a conversation package. Otherwise, ER functionality is ignored; the STR is processed as usual; and a nonfatal unexpected parameter application error is detected. When the STR message is received in a conversation package, the STR request can include digit collection. In this case, the SCP can request a specified tone, a standard announcement, or a custom announcement to be played prior to digit collection. This prompt can be non interruptible (played to completion before allowing any digit collection) or interruptible (the prompt is interrupted upon the receipt of the first digit).

14.9.2 External STR-ER

For external STR-ER, the STR message must be received in a conversation package, specifically, in response to an O_NoA query or a T_NoA query. Otherwise, ER functionality is ignored, the STR is processed as usual, and a nonfatal unexpected parameter application error is detected.

The FlexParameterBlock and destinationAddress parameters only exist for External STR-ER:

FlexParameterBlock:
The FlexParameterBlock is a field of the STRParameterBlock that simply contains data that is sent directly to the IP.

DestinationAddress:
The destinationAddress parameter is the DN of the IP. It routes to the IP much the same way as an Analyze_Route routes to a regular DN.

For external STR-ER, a connection is made to an IP in order to play announcements and/or collect digits. The calling party interacts with the service on the IP rather than the SSP. Interactions between an SSP and the IP use Integrated Services Digital Network (ISDN) Primary-Rate Interface (PRI), NI-2 variant.

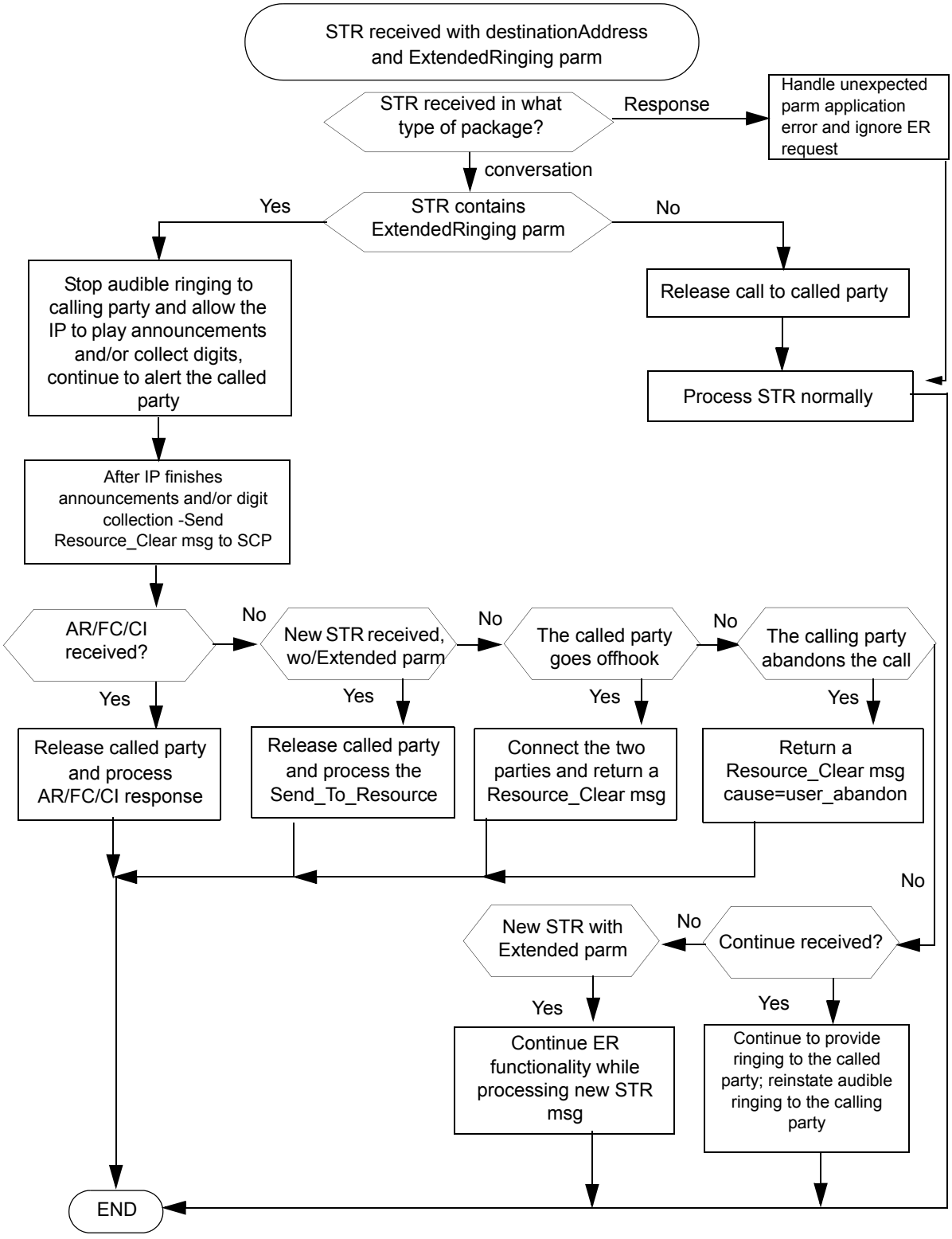
The variant of the PRI link is specified in Table LTDEF (LTCLASS=PRA, VARIANT=NIPRI, ISSUE= NI2V1). The PRI to be used for external STR-ER connections must be provisioned for the option AIN_IPI_STR in Table LTDATA. When the PRI variant is not NI-2 or when option AIN_IPI_STR is not present in Table LTDATA, a Resource_CLEAR with Clear_Cause=Abort message is sent to the off-board processor.

External STR-ER uses ISDN translations during response processing. It is necessary to ensure that Table RCNAME and Table RTECHAR are properly datafilled. See AIN SE Service Implementation Guide: “Datafilling for toll-free service,” or “Overview of AIN response translations.”

14.9.2.1 External STR-ER response handling

The diagram shown in Figure 7 illustrates message handling based on the type of response received from the SCP.

Figure 71 External STR-ER response handling



14.9.2.2 External STR-ER Configuration

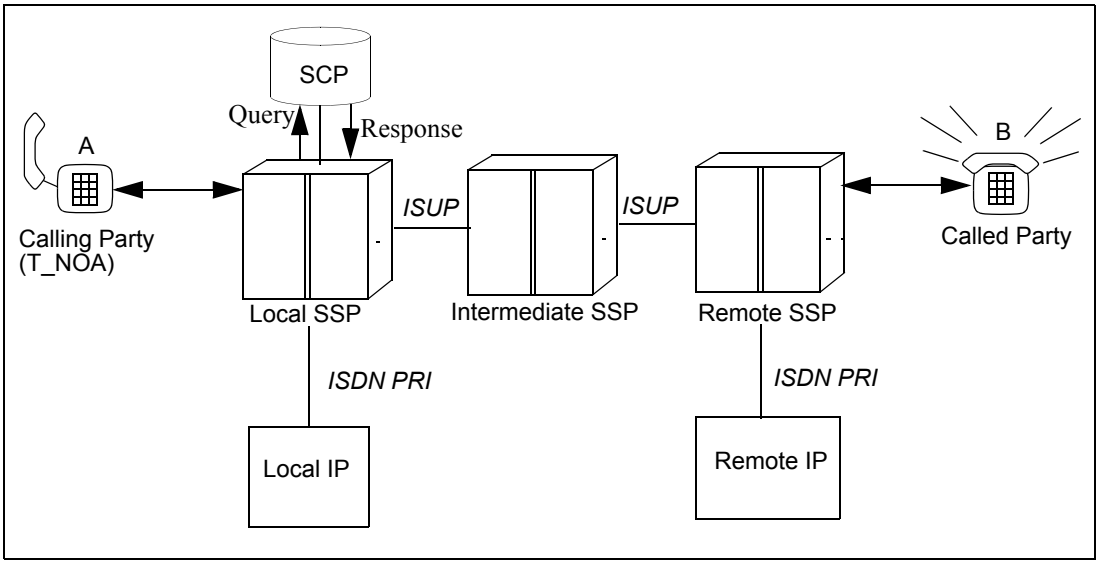
The SSP that encountered the trigger and received the request from the SCP to establish an STR-connection is referred to as the **local SSP**. The IP that is requested by the SCP may or may not have a direct PRI link to the local SSP:

- In a **local IP** configuration, the IP is connected to the switch that is triggering.
- When the IP is connected to a switch other than the one that is triggering, it is referred to as a **remote IP**.
- The SSP that has a direct PRI connection to the remote IP is referred to as the **remote SSP.**

The connection between the local (triggering) SSP and the remote SSP, optionally through intermediate SSP(s), is ISUP. Refer to the chapters “STR Connection to a local IP” and “STR Connection to a remote IP” for scenarios showing valid D-channel signalling.

The following figure shows the External STR-ER topology with a local IP and a remote IP.

Figure 72 External STR-ER topology with local IP and remote IP



14.10 PartyId and PartyOnHold parameter support

Two new parameters in STR message PartyId and PartyOnHold are supported. The PartyId and PartyOnHold parameters are optional parameters.

The PartyId parameter specifies the agent to which the resource needs to be connected. The PartyID parameter can have three values Calling, Called & allParties

When the PartyOnHold parameter is present, the other party to which the resource is not connected is put on hold.

In this release the PartyId and PartyOnHold is supported only for Timeout and STR in open transaction.

The table below explains the functionality of PartyId and PartyOnHold parameters.

Table 152 STR PartyId and PartyOnHold parameter functionality

Package Type	PartyId	PartyonHold present	Functionality
Response	Calling or PartyId parameter not present	N/A	The Resource (Internal Only) is connected to the calling party. The Called party is disconnected from the call (Line agents are provided dial tone. The Trunk Agents are released.). The Calling party is disconnected after the announcement is complete (Line agents are provided dial tone. The Trunk Agents are released.).
Conversation	Calling	No	The Resource (Internal/IP) is connected to the calling party. The Called party is disconnected from the call (Line agents are provided dial tone. The Trunk Agents are released.).The newer transactions are closed with a Close Cause value of “callTerminated”. Normal STR processing will continue. Resource Clear is sent after the end of user Interaction.
Conversation	Calling or PartyId parameter not present	Yes	The Resource (Internal/IP) is connected to the calling party. The Called party is put on hold. Normal STR processing will continue. Resource Clear is sent after the end of user Interaction.
Response	Called	N/A	The Resource (Internal Only) is connected to the Called party. The Calling party is disconnected from the call (Line agents are provided dial tone. The Trunk Agents are released.). The Called party is disconnected after the announcement is complete (Line agents are provided dial tone. The Trunk Agents are released.).

Table 152 STR PartyId and PartyOnHold parameter functionality

Package Type	PartyId	PartyonHold present	Functionality
Conversation	Called	No	PartyID = CalledParty without PartyOnHold parameter in STR Conversation Package will be treated as application error. An application error message will be sent to the SCP with error cause of unexpected message. The Call be cleared in both the forward and backward directions after the announcement is complete. The NEL's are closed with a close cause of "callTerminated"
Conversation	Called	Yes	The Resource (Internal/IP) is connected to the called party. The Calling party is put on hold. Normal STR processing will continue. Resource Clear is sent after the end of user Interaction.
Conversation	allParties	No	The Resource (Internal/IP) is connected to all the agents involved in the Call. In case of Internal Resource 1. Announcement will be played to all the agents. 2. Digit collection will be done from all the agents for Fixed, Variable and Normal Digit Collection types. The digits will be collected in the order in they are entered by the agents. 3. For Normal Digit Collection the Translation is done w.r.t the triggering Agent's dial plan.
Conversation	allParties	Yes	SSP will perform the procedures for non-fatal unexpected parameter error and process the message. The STR message is processed ignoring the PartyOnHold parameter.
Response	any Value or PartyId not present	Yes	SSP will perform the procedures for non-fatal unexpected parameter error and process the message. The STR message is processed ignoring the PartyOnHold parameter.

14.10.1 Agent Support

The Agent support for regular STR message is also applicable for STR message containing PartyId and PartyOnHold Parameters.

14.10.2 Continue Message Processing

When a Continue message is received in response to a Resource_Clear message for which the Send_To_Resource message

- contained PartyOnHold parameter and did not contain the PartyID parameter or the PartyID parameter had a value of “callingParty” or “calledParty”, the original connections in the call are retrieved. The EDP requests in the backward and forward directions are preserved.
- PartyID parameter had a value of “allParties”, the original connections in the call are retrieved. The EDP requests in the backward and forward directions are preserved.
- did not contain PartyOnHold parameter and did not contain the PartyID parameter or the PartyID parameter had a value of “callingParty” the Call is brought down. The NELs will be closed with a closecause of “CallTerminated”.

14.10.3 Analyze Route/Forward Call Message processing

When the SSP receives a Forward_Call or Analyze_Route message in response to a Resource_Clear message the SSP clears the call in the forward direction towards the called party and process the instructions contained within the Forward_Call or Analyze_Route

14.10.4 Disconnect Response Processing

When the SSP receives a Disconnect in response to a Resource_Clear the Disconnect message is processed and the call is cleared in both the forward and backward directions.

14.10.5 User Disconnects during Resource Interaction

When any agent in the call abandons during resource interaction (Internal/IP) or after the resource clear is sent (T1 Timer running),

- A resource Clear message in response package with a ClearCause of “userAbandon” is sent to the SCP.
- The Disconnect events if armed and applicable are detected. If the Disconnect events are not armed or not applicable, the call is brought down. Disc treatment is provided to the other agent.

14.10.6 Error Scenarios

When PartyOnHold and PartyID parameters are present in a STR message in response other than Timeout EDPR or STR in Open transaction, SSP will perform the procedures for non-fatal unexpected parameter error and process the message. The STR message is processed ignoring the PartyId and PartyOnHold parameter.

14.10.7 Feature interactions

The Call shall be considered as a multiparty call only when its in conference. For example, when the call is in a 3wc consult mode or in a CWT the individual call legs will be considered as separate Stable two Party calls.

When the Party to which the Resource is intended is not involved in the call a ResourceClear with a ClearCause of “invalidleg” is sent back to SCP in a Conversation Package.

14.11 Send _To_Resource in open transaction

AIN Send to Resource in an open transaction allows the SCP to send STR message (either in Conversation with permission or Response package) in a stable two-party call where there is any Open transaction between SSP and SCP.

- PartyId and PartyOnHold parameters are supported in STR open transaction.
- The behavior of STR in open transaction will be the same as if it was received for Timeout event.
- The events armed in the NEL for which SCP had send STR in open transaction will not be detected.

14.11.1 Valid messages after Resource_Clear for STR in open transaction

After Resource_Clear is sent for the STR in open transaction, the valid messages from SCP will be

- AnalyzeRoute (Only for the Transaction Initiated in Originating Call Model)
- ForwardCall (Only for the Transaction Initiated in Terminating Call Model)
- STR
- Continue
- Disconnect

14.11.2 Error handling

When the STR message is received in open transaction before the called party has answered then immediately resource_clear in a response package is sent to SCP. A Clearcause of “abort” is sent.

When the STR message is received in open transaction and another STR/CTR interaction is happening in the same call, we will send the resource_clear for the new transaction with errorcause as abort and the previous call will continue. While sending the resource_clear the message is dequeued and buffer is freed.

When the STR message is received in open transaction and another STR/CTR is already happening for the same transaction then the second STR message is ignored.

In a fatal error scenario, where a mandatory parameter is missing in the STR Open Transaction message from SCP, the call will be brought down.

If an error occurs at the Proxy level then a swerr is generated from the Proxy process and the message will not be queued to the BMS queue.

14.11.3 Feature interactions

The behavior of STR in open transaction will the same as if it was received for any Timeout CPH event query. When call is transfered (CXR), the sequence of CPH events armed in the call, will change from scenario to scenario.

14.11.4 Limitations and restrictions

If Timeout in OCM is armed in an established conference, and the Timeout timer expires, if Send To Resource response is received and this response tries to tearforward the conference controller, an unexpected communication is sent from the SSP to the SCP.

SendToResource response processing is not supported in passive leg (that is inactive leg).

14.12 Send_To_Resource in query with permission

AIN Send to Resource in an Query with permission package allows the SCP to send STR message to a DN (specified by the mandatory parameter “CalledPartyID”). The DN should be in a call in talking state.

- CalledPartyID is a mandatory parameter in STR received in QWP.
- The behavior of STR in QWP will be the same as if STR was received for Timeout event.

14.12.1 Valid messages after Resource_Clear for STR in query package

After Resource_Clear is sent for the STR in query package, the valid messages from SCP will be

- Continue
- Disconnect

14.12.2 Error handling

When the STR message is received in QWP for a DN who is not in talking state then resource_clear in a response package is sent to SCP. A Clearcause of “dnNotActive” is sent.

When the STR message is received in QWP and another STR/CTR interaction is happening in the same call, we will send the resource_clear for the new transaction with Clearcause as “abort” and the previous call will continue.

In a fatal error scenario, where a mandatory parameter CalledPartyID is missing then a failure report with the failure cause “inAppropriateUserInterface”.

If an error occurs at the Proxy level then a swerr is generated from the Proxy process and the message will not be queued to the BMS queue.

14.12.3 Feature interactions

The behavior of STR in QWP will be the same as if STR was received for any Timeout CPH event query.

14.12.4 Limitations and restrictions

SendToResource response processing is not supported in passive leg (that is inactive leg).

14.13 Reporting Send_To_Resource results and errors

Table 153 provides three successful completion scenarios for Send_To_Resource processing.

Table 153 Reporting successful completion

Scenario	Action to be taken for conversation package	Action to be taken for response package
1) ResourceType= Play Announcement. Announcement/tone is played. Successful completion.	This is a Non-Fatal Unexpected Communication Error. Close the transaction: Send Return Result Component in Response package without specifying any operation id. For lines: Disconnect the call by applying Disconnect Timeout Treatment. For ISDN-BRI: Initiate Call Clearing.	For lines: Disconnect the call by applying Disconnect Timeout Treatment. For ISDN-BRI: Initiate Call Clearing.
[1] The component type for Resource_Clear message is always Invoke (Last). [2]10XXX or 101XXXX.		

Table 153 Reporting successful completion

Scenario	Action to be taken for conversation package	Action to be taken for response package
2) ResourceType=Play Annc & Collect Digits. Digit Collection Type: Fixed or Variable. Specified tone is playedDigits are collected.Successful completion.	Send ResourceClear message[1] in Conversation package with: - ClearCause= Normal - (optional)CollectedDigits.	Not applicable
3) ResourceType=Play Annc & Collect Digits. Digit Collection Type: Normal Digit Collection. Specified tone is played. Digits are collected. Successful completion.	Send ResourceClear message in Conversation package with: - ClearCause= Normal - (optional) CollectedAddressInfo and appropriate Nature of Number coding. When an inter-LATA carrier code is dialed, Carrier parameter is included.	Not applicable
[1] The component type for Resource_Clear message is always Invoke (Last). [2]10XXX or 101XXXX.		

Table 154 provides four error report scenarios for Send_To_Resource processing.

Table 154 Reporting errors

Scenario	Action to be taken for conversation package	Action to be taken for response package
1) Requested resource is not implemented or installed. (An announcement validation error is equivalent to unimplemented resource)	Send an Application_Error message in Response package (Component Type= ReturnError) with ApplicationErrorString.ErrorCause = ErroneousDataValue. Provide AINF treatment[1].	Send a ReportError message in Unidirectional package (Component Type= Invoke(Last)) with ApplicationErrorString.ErrorCause = ErroneousDataValue Provide AINF treatment and terminate the call[2].
[1]GR-1298 [460] does not specify whether or not this is a fatal error, but [682] says that an invalid parameter is a fatal error when the parameter cannot be dropped. This means that AINF treatment should be applied. [2] Although the specs require reorder treatment, the legacy STR applies AINF treatment in this case and sends an Application Error message. We follow the legacy AIN convention.		

Table 154 Reporting errors (Continued)

Scenario	Action to be taken for conversation package	Action to be taken for response package
2) Announcement/tone or digit collector unavailable (resource busy) OR A h/w error occurs while playing the annc/tone or coll digits.	Send ResourceClear message in Conversation package with: - ClearCause = Failure and - FailureCause = UnavailableResources.	Provide reorder treatment and terminate the call.
3) Specified announcement requires digits, but digits are not provided by SCP.	Send an ApplicationError message in Response package (Component Type= ReturnError) with ApplicationErrorString.ErrorCause = ErroneousDataValue. Provide AINF treatment.	Send a ReportError message in Unidirectional package (Component Type= Invoke(Last)) with ApplicationErrorString.ErrorCause = ErroneousDataValue Provide AINF treatment.
4) Play announcement & collect digits (any type). Collected digits are not valid.	Send ResourceClear message in Conversation package with: - ClearCause = InvalidCode - Invalid digits are reported via optional parameters CollectedDigits or CollectedAddressInfo (with NatureOfNumber= Not Applicable).	Not applicable

[1]GR-1298 [460] does not specify whether or not this is a fatal error, but [682] says that an invalid parameter is a fatal error when the parameter cannot be dropped. This means that AINF treatment should be applied.

[2] Although the specs require reorder treatment, the legacy STR applies AINF treatment in this case and sends an Application Error message. We follow the legacy AIN convention.

Table 155 provides one report scenario for caller abandon and two report scenarios for the Cancel_Resource_Event in Send_To_Resource processing.

Table 155 Reporting caller abandon and Cancel_Resource_Event

Scenario	Action to be taken for conversation package	Action to be taken for response package
1) Caller Abandons	Send ResourceClear message in Response package with: - ClearCause = UserAbandon, Disconnect (Clear the call).	Disconnect (Clear the call).
2) Cancel Resource Event (valid- i.e. received while playing non-interruptible annc &collecting 0 digits)	Send ResourceClear message in Conversation package with - ClearCause = ResourceCancelled.	Not applicable
3) Cancel Resource Event (invalid)	Send an ApplicationError message in Response package (Component Type= Return Error) with -ApplicationErrorString. ErrorCause = UnexpectedMessage, - FailedMessage =CancelResource. Provide AINF treatment.	Not applicable

14.14 Send_To_Resource results and errors specific to Extended Ringing

This section describes Send_To_Resource results and errors, specific to Extended Ringing.

14.14.1 Send_To_Resource message with Extended Ringing events

Table 156 describes standard events that can be detected during Extended Ringing processing when an O_No_Answer or T_No_Answer query is sent

and a Send_To_Resource response message with parameter ExtendedRinging is received.

Table 156 Send_To_Resource message with Extended Ringing events

Scenario		Action	Query
1	Called party answers during STR-connection	Send Resource_Clear message in Response package with: - ClearCause = calledPartyAnswered. SSP connects the calling and called parties.	O_NoA T_NoA
2	Calling party abandons	Release the call and stop STR processing.	O_NoA T_NoA
3	Analyze_Route response message received in response to Resource_Clear	Release the called party and process the Analyze_Route response message.	O_NoA
4	STR message (with no ExtendedRinging) is received in response to the Resource_Clear	Release the called party, and process the STR response message.	O_NoA T_NoA
5	STR message (with ExtendedRinging) is received in response to the Resource_Clear	Continue extended ringing on called party, and process the STR response message.	O_NoA T_NoA
6	Continue message received in response to the Resource_Clear	Reconnect the calling and called parties.	O_NoA T_NoA
7	Collect_Info message received in response to a Resource_Clear	Release the called party, and process the Collect_Info response message.	O_NoA
8	Forward_Call message received in response to a Resource_Clear	Release the called party and process the Forward_Call response message.	T_NoA

The following list describes in detail the eight standard events outlined in Table 156, that can be detected during Extended Ringing processing when an O_NOA or T_NoA query is sent and a Send_To_Resource response message with parameter ExtendedRinging is received.

1. When the called party goes off-hook, the called and calling parties are connected. The SSP discards any buffered digits (obtained during digit collection) and returns a Resource_Clear with ClearCause = ‘calledPartyAnswered’.
2. When the calling party abandons or exits the call, the call is released. The SSP returns a Resource_Clear with ClearCause = ‘userAbandon’.
3. When the SCP responds to the SSP’s Resource_Clear with an Analyze_Route response message, the SSP releases the called party, and re-routes the call based on the data obtained from the Analyze_Route response message.

4. When the SCP responds to the SSP's Resource_Clear with a new STR response message without parameter ExtendedRinging, the SSP releases the called party and applies the new STR processing to the calling party.

   Note: Once an STR response message is received in a TCAP transaction without parameter ExtendedRinging (for a call to a given party) the SSP ignores subsequent extended ringing requests that would apply to the same called party. When parameter ExtendedRinging is received in an STR response message for a new called party in the same extended transaction, then the request is processed by the SSP.

   For example, when the initial STR in response to the O_No_Answer message is followed by an Analyze_Route message and the new destination encounters the O_No_Answer event; and an STR message is received in response to the O_No_Answer EDP_Request message, that new STR response message can include parameter ExtendedRinging and ER functionality would be re-invoked.

5. When the SCP responds to the SSP's Resource_Clear with a new STR response message, that contains parameter ExtendedRinging, the SSP continues to providing ER functionality (station ringing to the called party) while processing the new STR response. This continues for all consecutive STR response messages as long as they contain parameter ExtendedRinging the called party does not answer, and the calling party does not hang up. When any subsequent STR response message does not contain this parameter, the called party is released from the call, and the response is processed without ER functionality.

6. When the SCP responds to the SSP's Resource_Clear with a Continue response message, the called and calling parties are connected. The SSP continues to provide station ringing to the called party, and re-applies audible ringing to the calling party.

7. When the SCP responds to the SSP's Resource_Clear with an Collect_Info response the called party is released, while the call gets routed based on the data obtained from the Collect_Info response message.

8. When the SCP responds to the Resource_Clear from the SSP with a Forward_Call response message, the SSP releases the called party and reroutes the call based on the data obtained from the Forward_Call response message.

14.14.2 Send_To_Resource message with Extended Ringing errors

Table 157 lists the error conditions that can be detected during Extended Ringing processing.

Table 157 Send_To_Resource message with ExtendedRinging errors

Scenario		Action
1	Parameter ExtendedRinging is in an STR response message that is received in a Response package.	The SSP ignores the Extended Ringing request, processes the STR response message and detects a non-fatal, unexpected parameter application error.
2	Parameter ExtendedRinging is in an STR response to a query, other than O_No_Answer and T_NoA.	The SSP ignores the Extended Ringing request, processes the STR response.
3	The SSP receives a STR response message, but is not able to process the message because of the unavailability, busy state, or failure of the SSP hardware or switch resources.	The SSP sends a Resource_Clear with ClearCause = “Failure” and with FailureCause = “unavailableResources” and waits for a response from the SCP. The SSP continues to apply ringing to the called party and waits for further instructions from the SCP.
4	For Internal STR-ER only: The SSP detects a digit collection time-out, or an invalid digit string is received when the SSP is collecting “normal number of digits.”	The SSP continues ringing the called party, sends a Resource_Clear with ClearCause = “invalidCode” and waits for further instructions from the SCP.
5	The SSP receives a Conversation package with a STR message and the ResourceType = “Play Announcement”.	The SSP processes the STR message as a Play Announcement request, ignores Extended Ringing, and detects a non-fatal, unexpected communication error.
6	The AIN T1 response timer expires, since the SCP has not responded to the SSP.	The SSP re-connects the calling and called parties and continues to provide station ringing to the called party, and then re-applies audible ringing to the calling party.
7	The SCP sends a Cancel_Resource_Event message.	The SSP stops the announcement, sends a Resource_Clear in a Conversation package with the ClearCause = “resourceCancelled”, it continues to apply ringing to called party, and waits for further instructions from the SCP.

Table 157 Send_To_Resource message with ExtendedRinging errors (Continued)

Scenario		Action
8	The SCP sends a Cancel_Resource_Event message when it is not expected.	The SSP treats the message as a fatal unexpected message error, re-connects the calling and called parties, continues to provide station ringing to the called party, and re-applies audible ringing to the calling party.
9	A mandatory parameter is detected as missing in the STR response message.	The SSP re-connects the calling and called parties, continues to provide station ringing to the called party, and re-applies audible ringing to the calling party.
10	After an STR-ER has begin processing, an ISUP RELease message is received after the called party (at the other end of an ISUP trunk) has been ringing for too long.	The SSP sends a Resource_Clear with ClearCause = “abort”; the calling party is routed to appropriate treatment.
11	The SSP receives a STR message that contains an ExtendedRinging parameter while in a three way call (bridged or not bridged).	This STR processing is canceled, a ResourceClear is sent to the SCP with ClearCause = ‘Abort’, and the calling and called parties remain connected.

14.15 Interactions

14.15.1 Processing caller abandon

When the caller abandons (hangs up) while processing a Send_To_Resource in a response package, the call is taken down.

When the caller abandons (hangs up) while processing a Send_To_Resource in a conversation package, a Resource_Clear message reporting that the user has abandoned the call is sent to the SCP and the call is taken down as specified in Scenario 1 of Table 155.

14.15.2 External STR-ER: called party answers

When the SSP receives a Send_To_Resource message with Extended Ringing parameter in response to an O_NoA or T_NoA query, the called party continues to receive ringing, while the calling party is connected to an announcement through an IP. If during the announcement the called party answers, the announcement is taken down, the calling and called parties are connected, and a Resource_Clear message with Cause=calledpartyanswer is sent to the SCP.

15 STR connection to a local IP

This chapter documents Send_To_Resource processing with a local IP, FS-4-4, under the following headings:

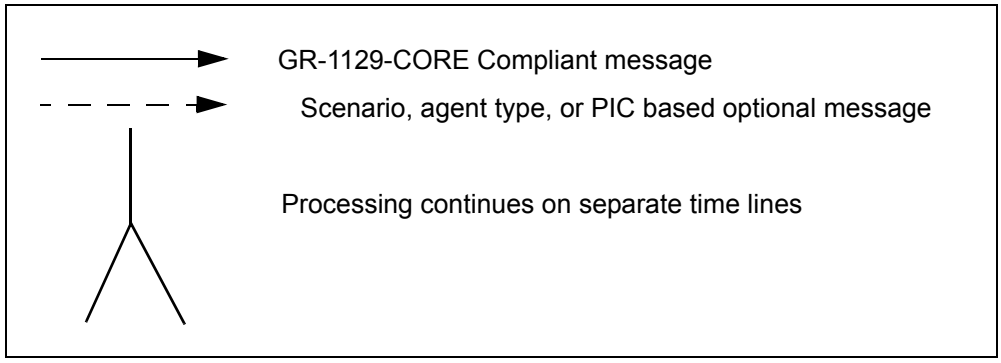
- STR connection setup; FSS-4-4-1
- Information exchange with a local IP; FSS-4-4-2
- STR connection clearing; FSS-4-4-3
- Exception and error scenarios for local IP configuration

15.1 Notational conventions

Behavior that is noncompliant with GR-1129-CORE, Issue 2, is noted in a compliance note where it occurs.

In this chapter, GR-1129-CORE, Issue 2, requirement numbers related to the steps in the scenarios below are indicated with global requirement numbers in italic within square brackets (for example, *[35]*).

Figure 73 Legend used in the message sequence charts (MSC)

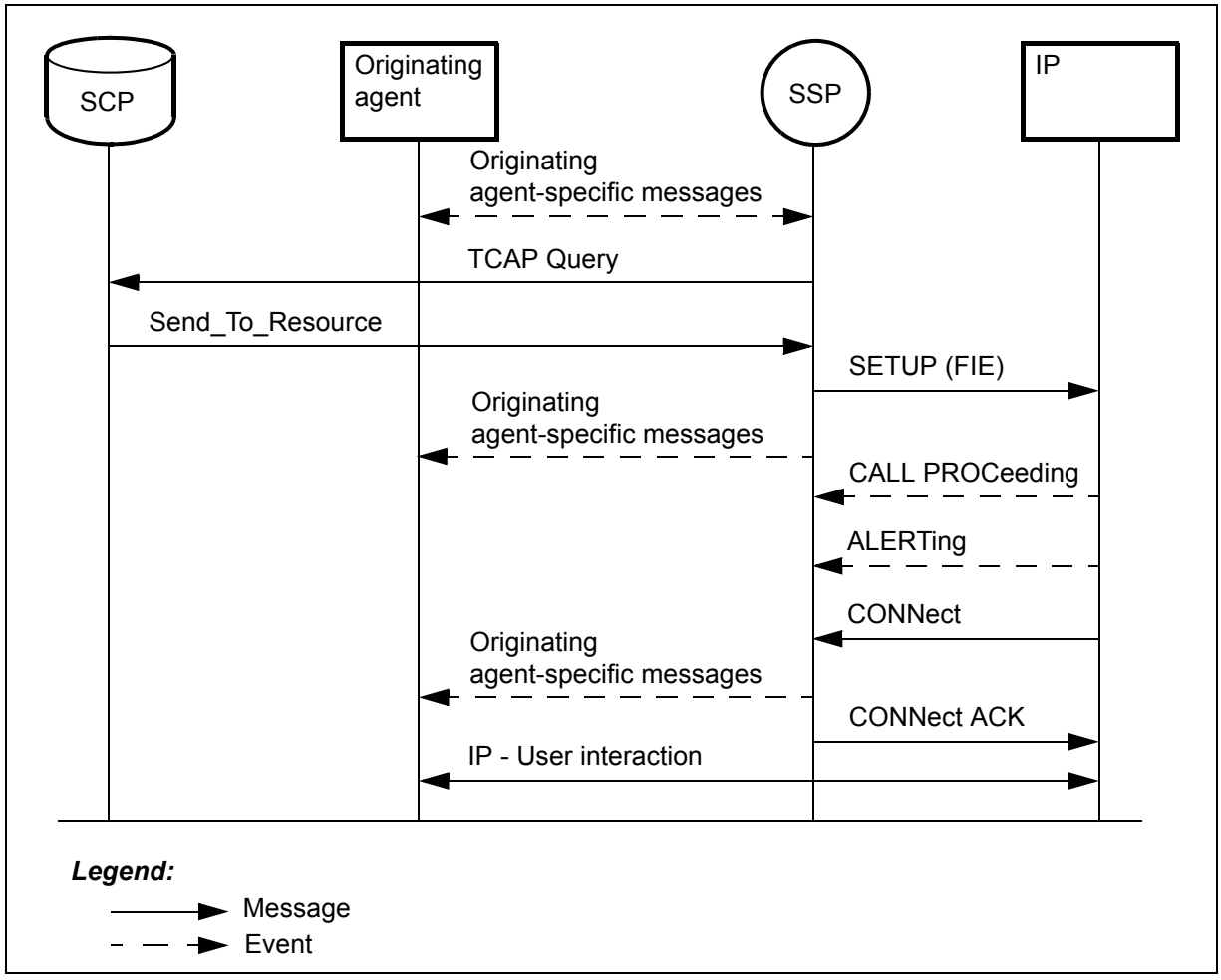


15.2 STR connection setup

This function covers FSS-4-4-1.

The following scenario describes how STR connection is established between the SSP and Local IP. See Figure 74 on page 550.

Figure 74 Establishing STR connection to a local IP



1. The SSP sends a query to the SCP or adjunct and receives a Send_To_Resource message (containing a valid DestinationAddress of a Local IP) in a conversation package.

   If the contents of the STRParameterBlock in the STR message is larger than 88 bytes, the SSP sends a Resource_Clear message with

clearCause=abort, to the SCP in a conversation package. Otherwise, the SSP proceeds as follows:

- The SSP checks whether it can transfer the information received in the STR message to the IP in a SETUP message. *[35]*
- The SSP checks that there is a free channel to the IP. *[36]*

2. The SSP sends a SETUP message to the local IP. The contents of the SETUP message are the following: *[37]*
   - The protocol discriminator, call reference, message type and channel identification information elements, *[37a]*
   - The bearer capability information element (determined from the call), *[37b]*
   - The calling number information element and the related privacy information, *[37c]*
   - ***Compliance note:*** This feature adopts the current DMS SSP practice and always sends the calling number, if available, to a PRI. It is expected that the receiving node (in this case the IP) will respect the privacy information and not reveal the calling number, if the caller has made appropriate provisions for hiding the calling party number.
   - The called party number, encoded as a 7-digit local (directory) number in ISDN Numbering Plan. *[37d]*

     Note: To achieve this, the AIN response translations should be setup to drop the first three digits of the 10-digit DestinationAddress from the SCP, when it routes to a PRI trunk.

   - A facility information element (FIE) shall contain an Invoke component. The Invoke component shall contain the Invoke identifier, the Operation value and the parameters. The Operation value is “SendToIPResource.” Mandatory parameters of this operation are ResourceType and STRParameterBlock. *[37e]*
   - If the STR message was received for a redirected call, the SETUP message contains the RN1 (first forwarding number) and RN2 (last forwarding number) information elements.
3. In addition to the SETUP message to the IP, the SSP provides the following treatment towards the calling user:
   - For a call originated from a nonISDN line, nonSS7 conventional trunk, or private-facility trunk, no additional treatment is applied.*[37f-i]*
   - For a call originated from an ISDN interface, the SSP sends a CALL PROCeeding message to the calling user if any of CALL

PROCeeding, ALERTing, or CONNect messages have not already been sent. *[37f-ii]*

- For a call originated from an SS7 trunk, if an ACM has NOT already been sent, the SSP sends an ISUP ACM message (with optional backward call indicator set to "user-network interaction") towards the originating switch.

  If an ACM has already been sent, but did not indicate "user-network interaction", the SSP sends an ISUP CPG message (with optional backward call indicator set to "user-network interaction", and the event information parameter set to "inband information available") towards the originating switch.

  If an ACM or CPG has already been sent indicating "user-network interaction" or if an ANM has already been sent, the SSP does not send any message towards the originating switch. *[47iv]*

  Compliance note: This is earlier than specified in the GR. However, it is deemed necessary so that the originator does not time-out waiting for the ACM.

4. The IP responds to the SSP with one of the following message combinations:
   - CALL PROCeeding - ALERTing - CONNect. *[43]*
   - CALL PROCeeding - CONNect. *[43]*
   - ALERTing - CONNect. *[44]*
   - CONNect. *[45]*
5. If the IP sends CALL PROCeeding or ALERTing messages to the SSP, the SSP does NOT report these messages to the originating agent. *[43], [44]*
6. Upon receiving the CONNECT message from the IP, the SSP cuts-through a connection in both directions and proceeds in one of the following ways depending on the originating agent (the agent specific processing outlined below is similar to the processing for AIN Essentials STR): *[47]*
   - For nonISDN line, no special processing is required. *[47i]*
   - For conventional or private-facility trunks, if the STR message contains an AnswerIndicator parameter, the SSP applies answer supervision on the incoming trunk, if answer supervision has not already been sent. *[47ii]*
   - For ISDN-line *[47iii]*
     — If the STR message does not contain an AnswerIndicator parameter, and if no ISDN message beyond CALL PROCeeding

has been sent to the user, the SSP sends an ISDN PROGress message.

— If the STR message contains an AnswerIndicator parameter, and if no ISDN message beyond CALL PROCeeding has been sent to the calling user, the SSP sends an ISDN CONNect message.

- For SS7 Trunk *[47iv]*

  If the STR message contains an AnswerIndicator parameter the SSP sends an ISUP ANM toward the originating switch, if one has not already been sent.

7. The SSP sends CONNect ACK to the IP, and starts the TSTRC timer. *[45]* Refer to Section 11.4.2 for a description of TSTRC Timer operation.
8. The IP and the user interact.

15.3 Information exchange with a local IP

This function covers FSS-4-4-2.

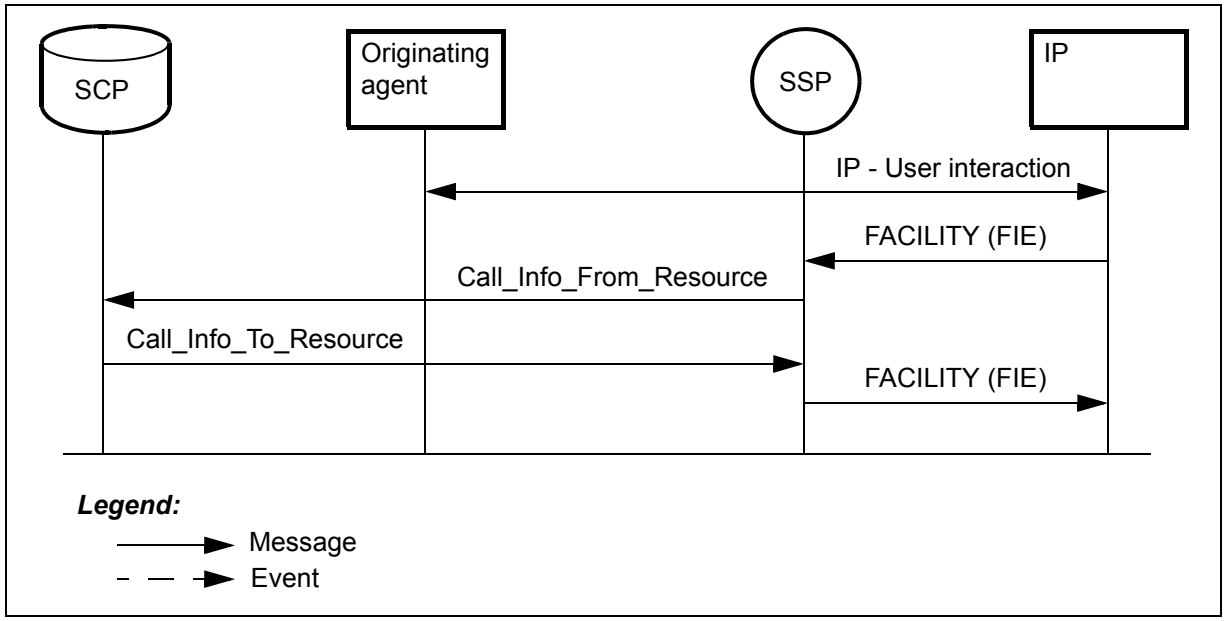
This section describes the following scenarios:

- The SSP transfers data between the IP and the SCP
- The SSP transfers data from the IP to the SCP and closes the connection

15.3.1 The SSP transfers data between the IP and the SCP

The scenario below is illustrated in Figure 75.

Figure 75 FACILITY - CIFR - CITR - FACILITY



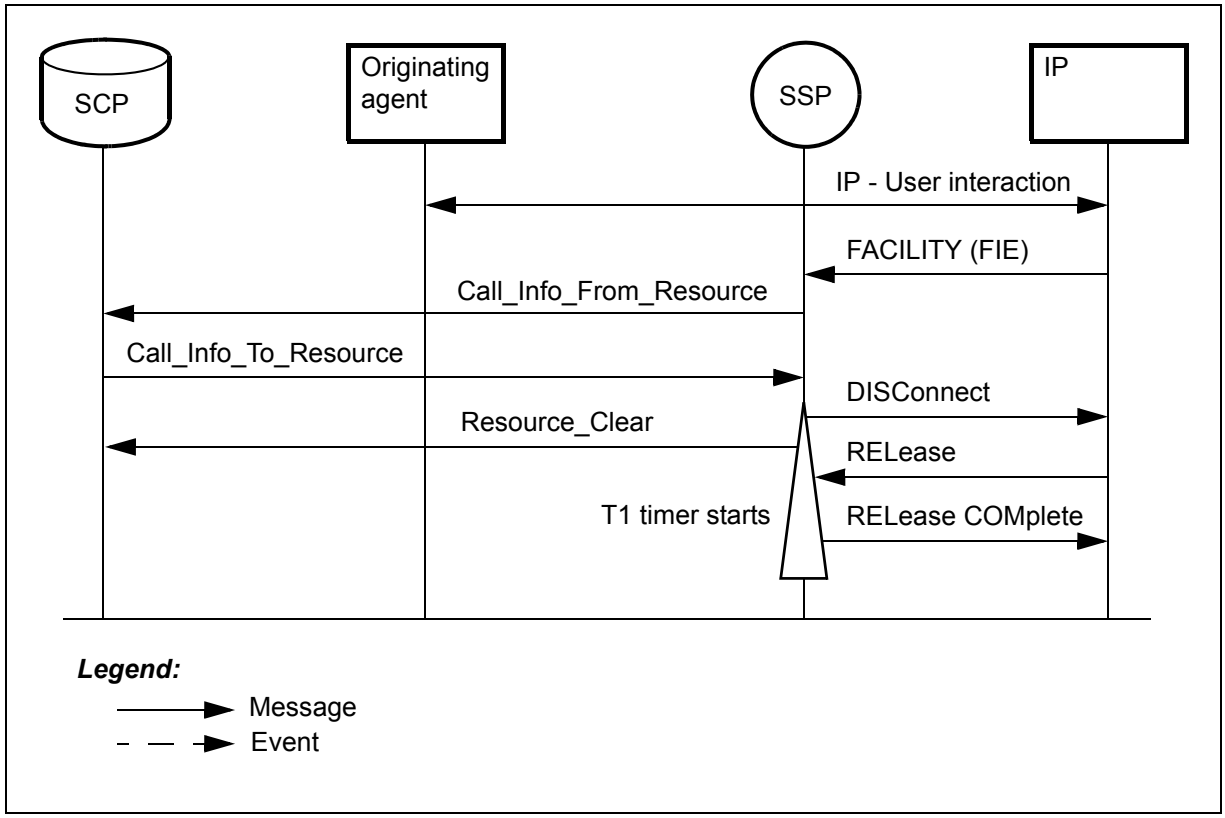
1. There is an active STR connection between the SSP and the IP.
2. The IP sends a FACILITY message to the SSP. The message contains
   - a Call Reference value established by sending the SETUP message for the STR connection. *[48]*
   - FIE with a Return Result component with an Invoke identifier that has the same value as the Invoke identifier sent by the SSP to the IP in the SETUP or a previous FACILITY message. *[49]*
3. There is no outstanding Call_Info_To_Resource message for the last Call_Info_From_Resource message, if any, for this STR connection. *[49]*
4. The SSP stops the TSTRC timer. The TSTRC timer is used to monitor the time taken by one single IP-User interaction. It is restarted with every intermediate information exchange. Refer to Section 11.4.2 for a description of TSTRC Timer operation.
5. The SSP includes the optional parameter IPReturnBlock in the Call_Info_From_Resource message if this parameter is included in the FIE. *[50]*
6. Upon sending the Call_Info_From_Resource message to the SCP or adjunct, the SSP starts the AIN T1 response timer. *[51]*
7. The SSP receives a Call_Info_To_Resource message from the SCP in a Conversation package. The Call_Info_To_Resource message contains a Return Result component to the previously sent Invoke (Not Last) component in the Call_Info_From_Resource message. The SSP cancels the AIN T1 response timer. *[57]*

8. The SSP sends a FACILITY message to the IP. The FIE contains an Invoke component which will contain an Invoke identifier, the Operation value and the arguments. The Operation value is "SendToIPResource." The SSP also includes the parameters in the FIE if they are present in the Return Result component of the Call_Info_To_Resource message. *[58]*
9. The SSP restarts the TSTRC timer. Refer to Section 11.4.2 for a description of TSTRC Timer operation.

15.3.2 The SSP transfers data from the IP to the SCP and closes the connection

In the following scenario, the SSP receives a valid FACILITY message from Local IP during an active STR connection. The SSP passes the information to the SCP in a Call_Info_From_Resource message. The SCP replies to the SSP with a Call_Info_To_Resource message. Call_Info_To_Resource message contains a Return Result component with NO parameters. See Figure 76 on page 555.

Figure 76 FACILITY - CIFR - CITR - RELEASE



1. The IP sends a FACILITY message to the SSP. There are no protocol errors in the FACILITY message. The message contains a Call Reference

value established by sending the SETUP message for the STR connection *[48]*

2. The FACILITY message contains the FIE with a Return Result component with an Invoke identifier that has the same value as the Invoke identifier sent by the SSP to the IP in a SETUP or FACILITY message. *[49]*
3. There is no outstanding Call_Info_To_Resource message for the last Call_Info_From_Resource message, if any, for this STR connection. *[49]*
4. The SSP sends a Call_Info_From_Resource message to the SCP or adjunct in a Conversation Package. The Call_Info_From_Resource message is sent in an Invoke (Not Last) component correlated to the Invoke (Last) component received in the Send_To_Resource message. *[50]*
5. The SSP also includes the optional parameter IPReturnBlock in the Call_Info_From_Resource message if this parameter is included in the FIE. *[50]*
6. The SSP stops the TSTRC timer. Refer to Section 11.4.2 for a description of TSTRC Timer operation.
7. Upon sending the Call_Info_From_Resource message to the SCP or adjunct, the SSP starts the AIN T1 response timer. *[51]*
8. The SCP sends Call_Info_To_Resource message to the SSP in a Conversation package. The Call_Info_To_Resource message contains a Return Result component to the previously sent Invoke (Not Last) component in the Call_Info_From_Resource message. The message contains no parameters. The SSP cancels the AIN T1 response timer. *[59]*
9. The SSP clears the STR connection; but does not clear the call to the calling user.
10. The SSP sends a Resource_Clear message to the SCP or adjunct. The Resource_Clear message is in Conversation package and include the ClearCause parameter containing a value of “normal.” *[59]*

15.4 STR connection clearing FSS

This function covers FSS-4-4-3.

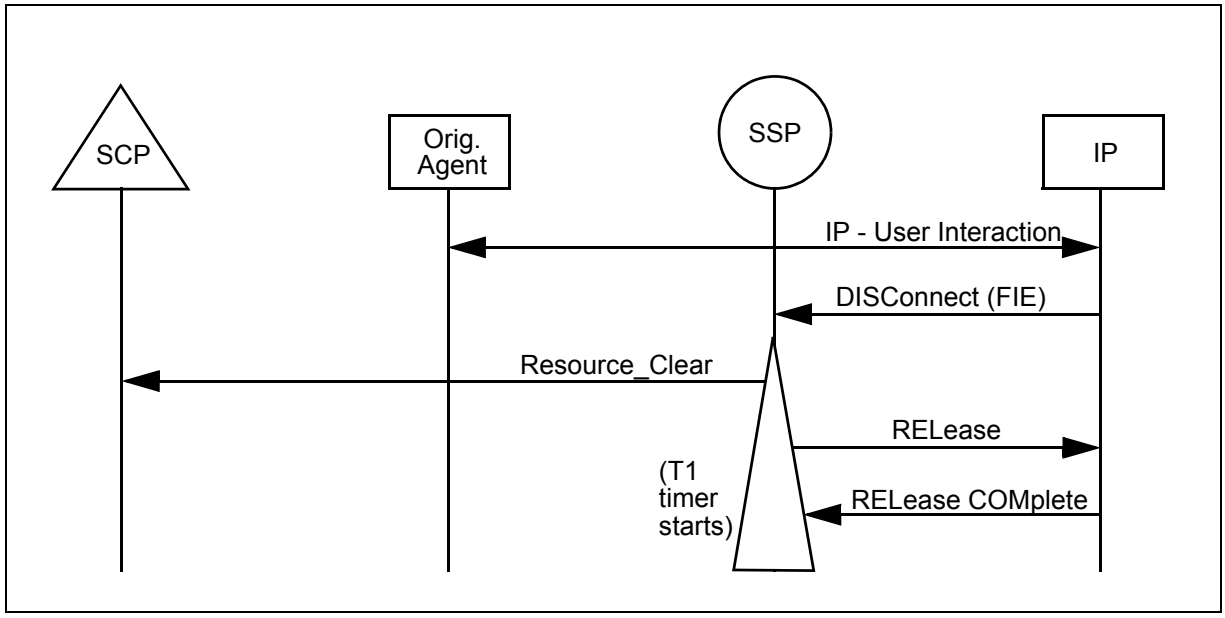
This section describes the following scenarios:

- IP-initiated clearing of an STR connection
- SSP-initiated clearing of an STR connection
- Caller abandon (on-hook or controller flashes during conference call)
- TSTRC timer expiry

15.4.1 IP-initiated clearing of an STR connection

In the following scenario the local IP requests to clear the STR connection after its interaction with the user is completed. See Figure 77 on page 557.

Figure 77 IP-initiated clearing of STR connection to a local IP



1. There is an active STR connection between the SSP and the IP.
2. The IP decides to clear the STR connection and sends a DISConnect message to the SSP. The DISConnect message contains a Return Result, Return Error or Reject component. *[61], [62], [63], [64]*
3. The SSP reports the message to the SCP/Adjunct in a Resource_Clear message in Conversation Package. The SSP sets the ClearCause parameter of the Resource_Clear message according to the contents of the DISConnect message:
   - If the DISConnect message contains a FIE which contains a Return Result component, the SSP sets the ClearCause parameter to “normal.” The SSP also includes the IPReturnBlock parameter in the Resource_Clear message if present in the FIE in the DISConnect message. *[61]*
   - If the DISConnect message contains a FIE which contains a Return Error component, the SSP interprets the receipt of the ReturnError component as an indication that the IP could not perform the “sendToIPResource” operation. The SSP sets the ClearCause parameter value directly from the Error Type in the Return Error component. If an error parameter is included in the Return Error component of the DISConnect message, the Resource_Clear message

contains a ClearCauseData parameter that contains the error parameter *[62]*

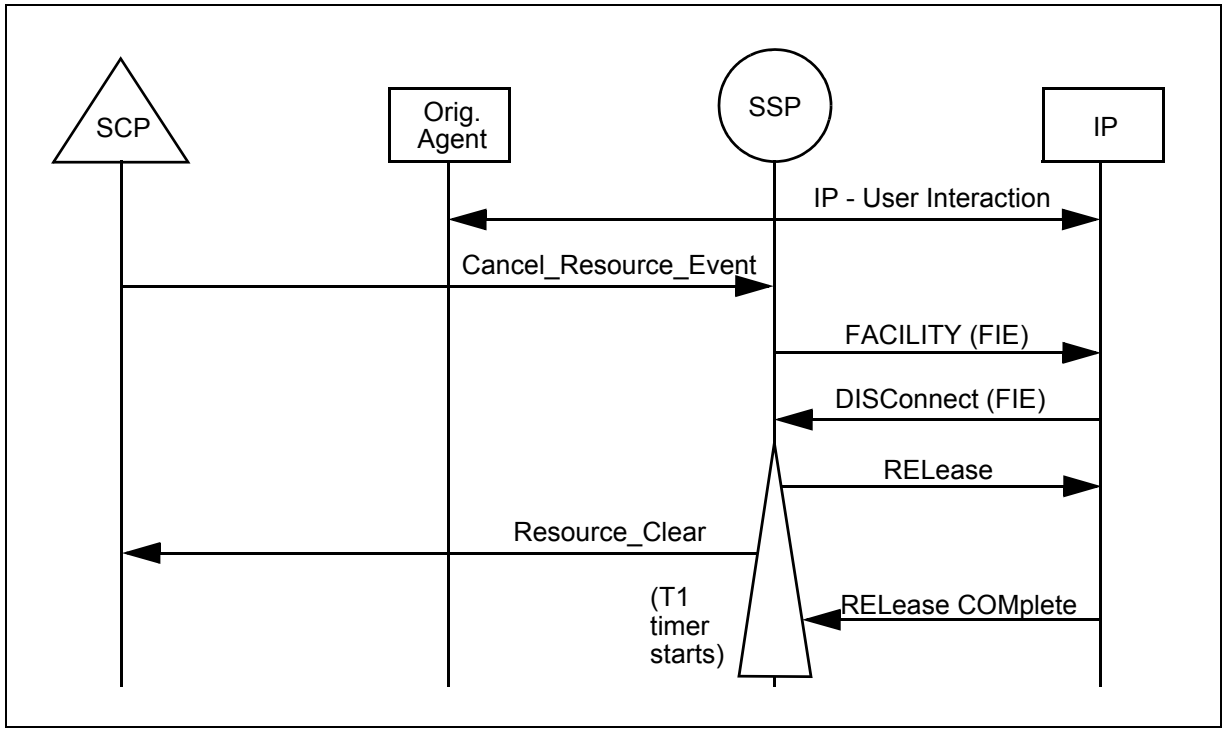
- If the DISConnect message contains a Reject component. the SSP sets the ClearCause parameter to “protocolError.” *[63]*
- If the DISConnect message does not contain a FIE, the SSP sets the ClearCause parameter to “abort.” *[64]*

4. The SSP releases the Invoke Identifier, and cancels the TSTRC timer (if running). *[61], [62], [63], [64]*
5. The SSP clears the STR connection as below, but does not clear the call to the originating user. *[61], [62], [63], [64]*
   - The SSP sends a RELease message to the IP.
   - The IP responds with a RELease COMplete message.

15.4.2 SSP-initiated clearing of STR connection

In the following scenario the SSP receives a Cancel_Resource_Event from the SCP or adjunct to clear an active STR connection. See Figure 78.

Figure 78 SSP requests IP to clear the call



1. The SSP accepts a Cancel_Resource_Event message from the SCP or adjunct after receiving Send_To_Resource message in a Conversation

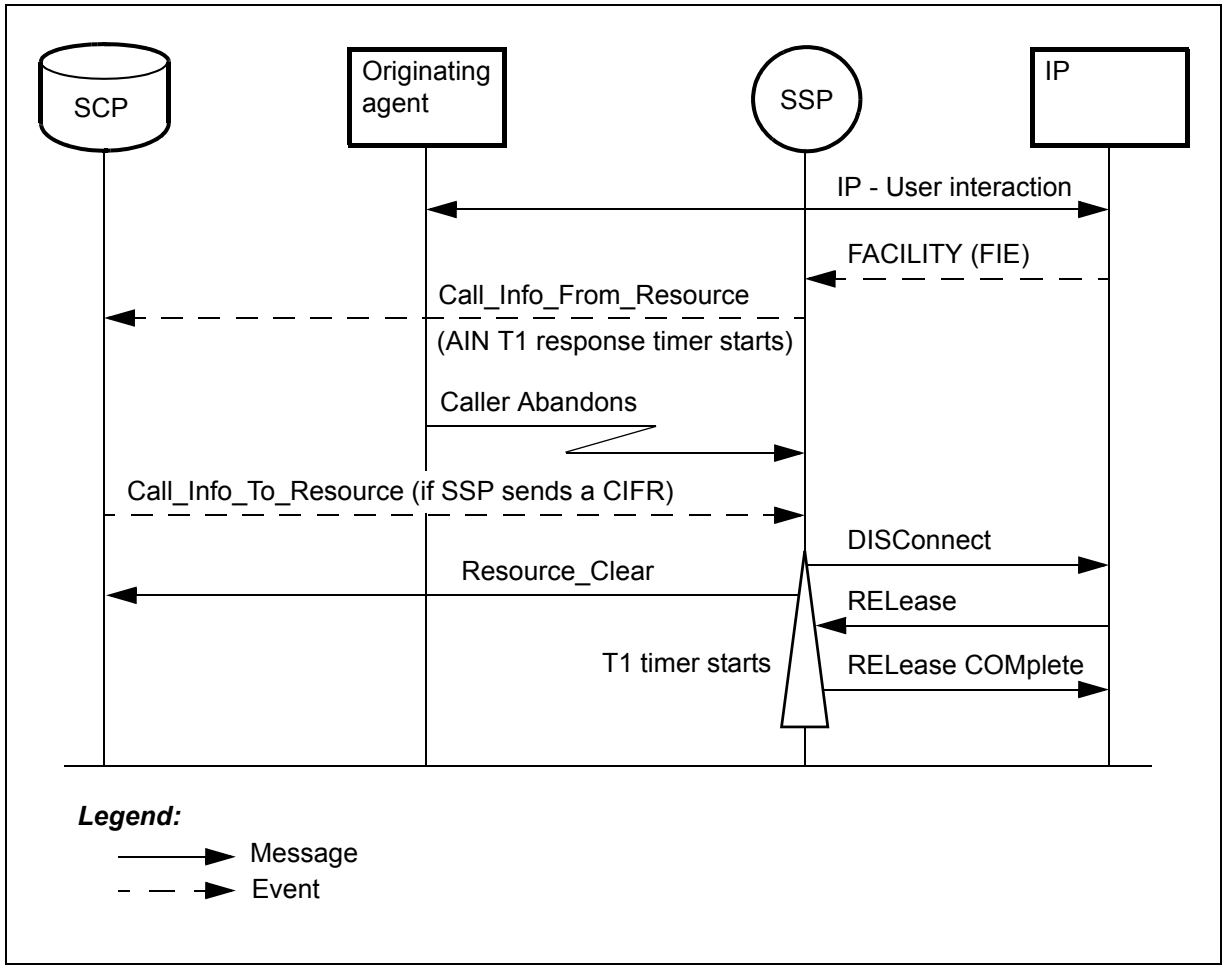
Package but before sending a Resource_Clear message. The SSP cancels the AIN T1 response timer (if running). *[66]*

2. The SSP sends a “cancelIPResource” operation in a FACILITY message to the IP. The SSP stops the timer TSTRC (if running) and starts the timer TDISC to wait for a DISConnect message from the IP. *[66]*
3. The SSP receives a DISConnect message from the IP before the TDISC timer expires. The SSP clears the STR connection as described below, but the SSP does not clear the call to the calling user. *[67]*
   - The IP responds with a RELease COMplete message.
   - The SSP sends a RELease message to the IP.
4. The SSP sends a Resource_Clear message to the SCP or adjunct in Conversation Package. The Resource_Clear message includes the ClearCause parameter and a value of “resourceCancelled.” If the IP returned the IPReturnBlock in the Return Result component contained in the DISConnect message, the SSP also includes the IPReturnBlock parameter in the Resource_Clear message. *[67]*

15.4.3 Caller abandon or flash after the STR connection is established

In the following scenario the caller abandons after the STR connection is established. See Figure 79. The SSP may have sent a CIFR message to the SCP and may be waiting for a CITR message.

Figure 79 Processing caller abandon



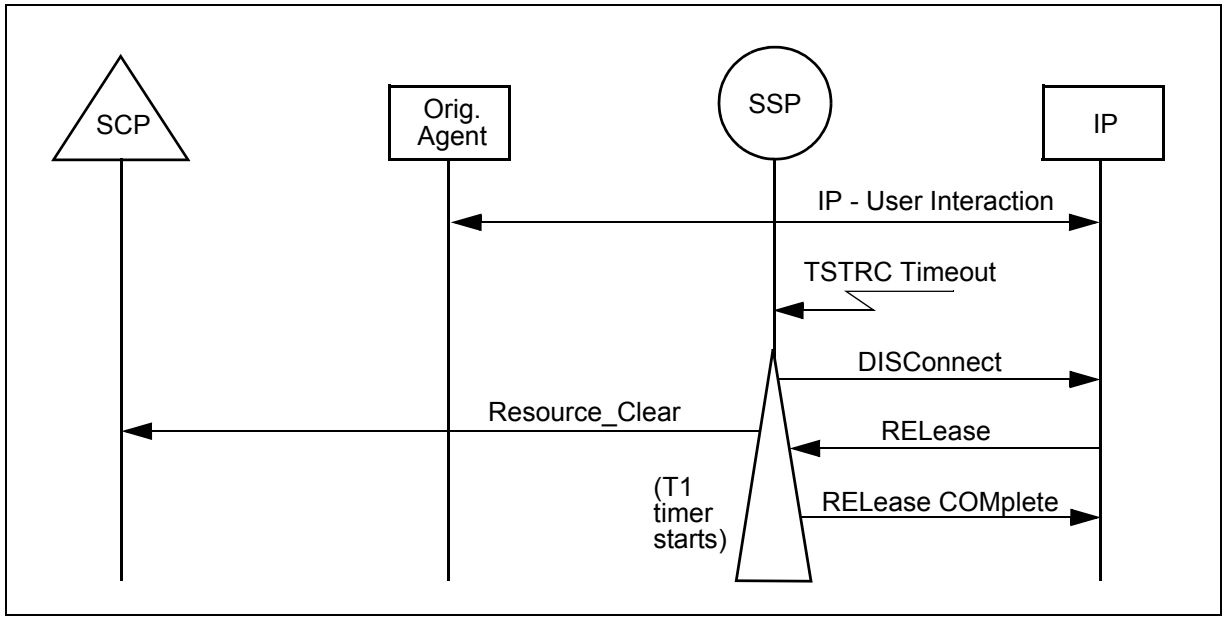
1. The caller abandons while there is an active STR connection.
2. The SSP clears the STR connection, by sending a DISConnect message to the IP *[68 to 71]*
3. Depending on the presence of an outstanding Call_Info_From_Resource message the SSP proceeds to one of the following:
   - If there is no outstanding Call_Info_From_Resource message, the SSP sends the Resource_Clear message to the SCP immediately in a response package with ClearCause=”userAbandon”.
   - If there is an outstanding Call_Info_From_Resource message, the SSP waits for the Call_Info_To_Resource message from the SCP, and then sends the Resource_Clear message to the SCP in a response package with ClearCause=”userAbandon”. The SSP discards the Call_Info_To_Resource message received. *[69]*

The same processing applies if the originating agent goes on-hook or flashes during an active STR connection.

15.4.4 TSTRC timer expiry

The SSP initiates the TSTRC timer for a Send_To_Resource connection after receiving a CONNect message from an IP and restarts it after sending a FACILITY message to the IP. If this timer expires before the SSP receives a DISConnect or RELease COMplete or FACILITY message from the IP, the SSP clears the connection to the IP and notifies the SCP. See Figure 80.

Figure 80 TSTRC timer expires



1. There is an active STR connection between the SSP and the IP.
2. Timer TSTRC expires.
3. The SSP clears the STR connection. *[73]*
4. The SSP sends a Resource_Clear message to the SCP or adjunct in a Conversation Package. The Resource_Clear message includes the ClearCause parameter containing a value of “ipTimeout.” *[73]*
5. The SSP does not clear the call to the calling user. *[73]*

Refer to Section 11.4.2 for a description of TSTRC Timer operation.

15.5 Exception and error scenarios for local IP configuration

This section documents the SSP behavior in event of exception scenarios, such as the following:

- local IP's response to an unacceptable SETUP message
- SSP cannot transfer information to IP
- caller abandons before a STR connection is established
- IP does not respond to a SETUP message
- TDISC timer expires during a Cancel_Resource_Event message from the SCP
- SSP receives an unacceptable FACILITY message
- SSP does not recognize the operation value in a FACILITY message
- SSP receives a reject component in a FACILITY message
- SSP receives a return error component in a FACILITY message
- SSP does not receive a valid reply from the SCP in response to a Call_Info_From_Resource message

15.5.1 Local IP's response to an unacceptable SETUP message

In the following scenario, the IP receives an unacceptable SETUP message from the SSP. The IP clears the STR connection by responding with a DISConnect or RELease COMplete message. See Figure 81 on page 563 and Figure 81 on page 563.

Figure 81 Local IP's Response to an Unacceptable Setup Message (Case 1)

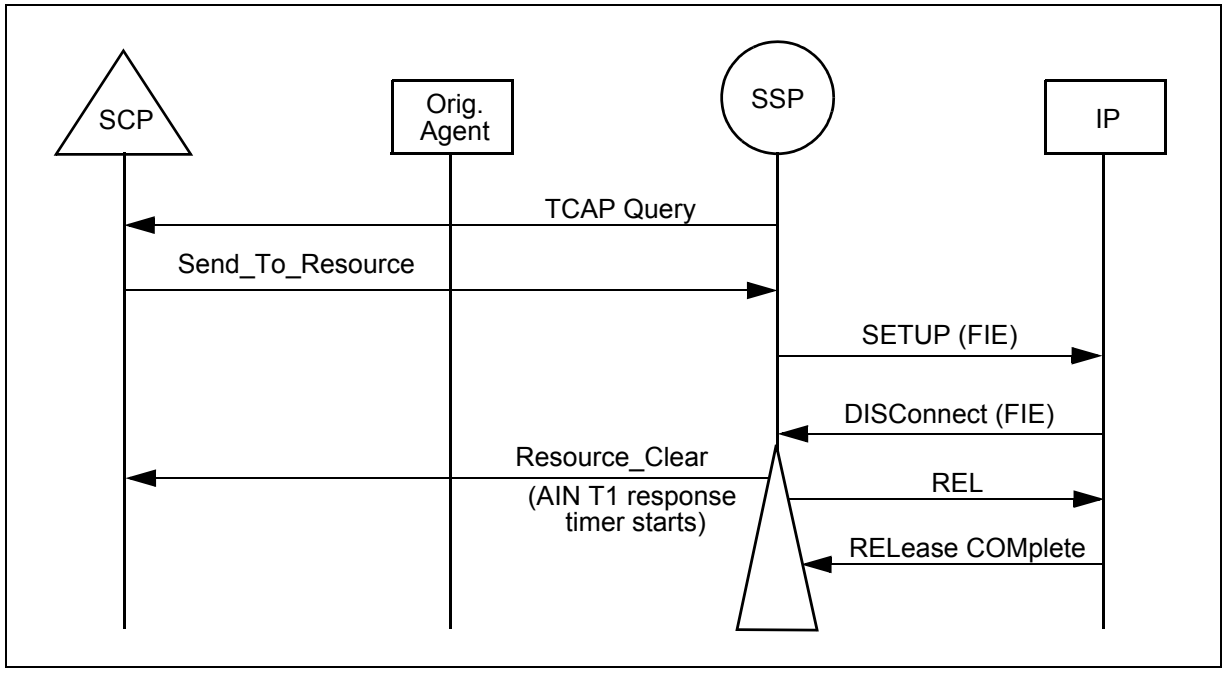
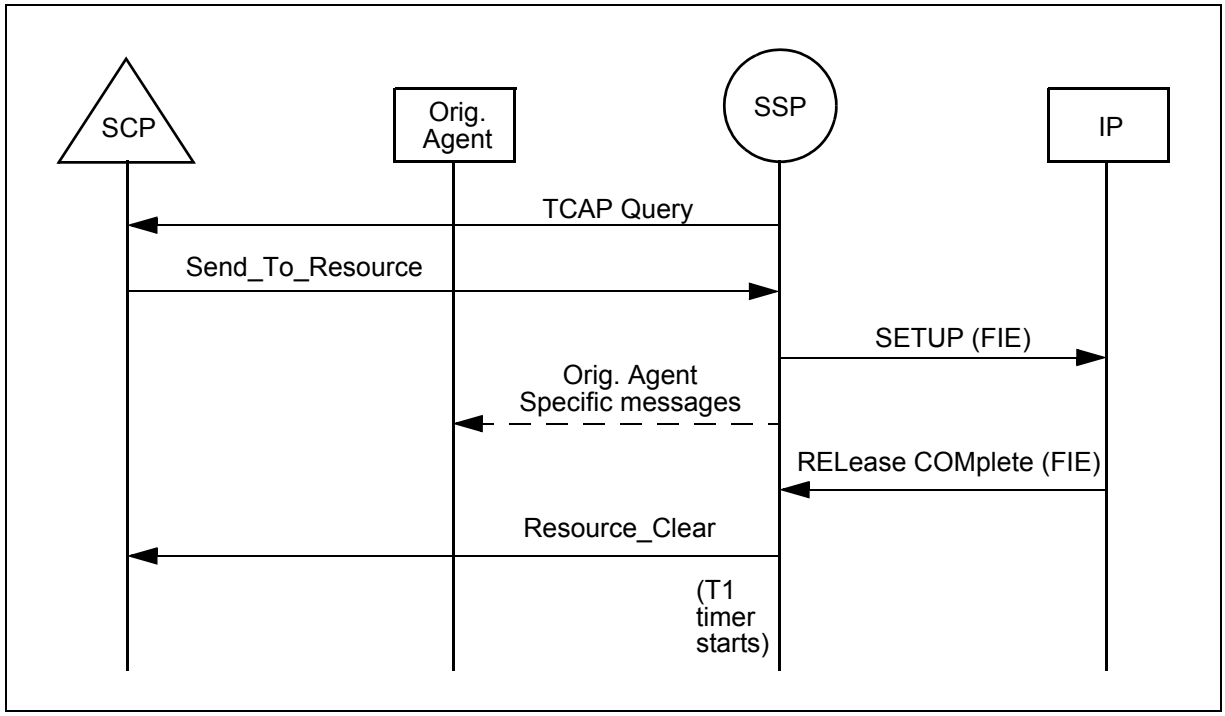


Figure 82 Local IP's response to an unacceptable SETUP message (Case 2)



1. The SSP sends a query to SCP or adjunct and receives a Send_To_Resource message (containing a valid DestinationAddress of a Local IP) in a conversation package.
   - The SSP checks whether it can transfer the information received in the STR message to the IP in a SETUP message. *[35]*
   - The SSP checks that there is a free channel to the IP. *[36]*
2. The SSP sends a SETUP message to the local IP. *[37]*
3. If necessary, the SSP sends agent specific messages to bring the Orig. Agent to the appropriate state. *[37f]*
4. The SETUP message is unacceptable for the IP for some reason (for example, the protocol errors, or invalid Invoke component). An STR connection can not be established between the SSP and the IP. The IP sends either a DISConnect or RELease COMplete message to the SSP. *[42]*
5. The SSP reports the message to the SCP/Adjunt in a Resource_Clear message in Conversation Package. The SSP sets the ClearCause parameter of the Resource_Clear message according to the contents of the received DISConnect message or RELease COMplete message:
   - If a DISConnect message or a RELease COMplete message is received and it contains a FIE which contains a Return Error component, the SSP interprets the receipt of the ReturnError

component as an indication that the IP could not perform the "sendToIPResource" operation. The SSP sets the ClearCause parameter value directly from the Error Type in the Return Error component.If an error parameter is included in the Return Error component of the DISConnect message, the Resource_Clear message contains a ClearCauseData parameter that contains the error parameter *[62]*

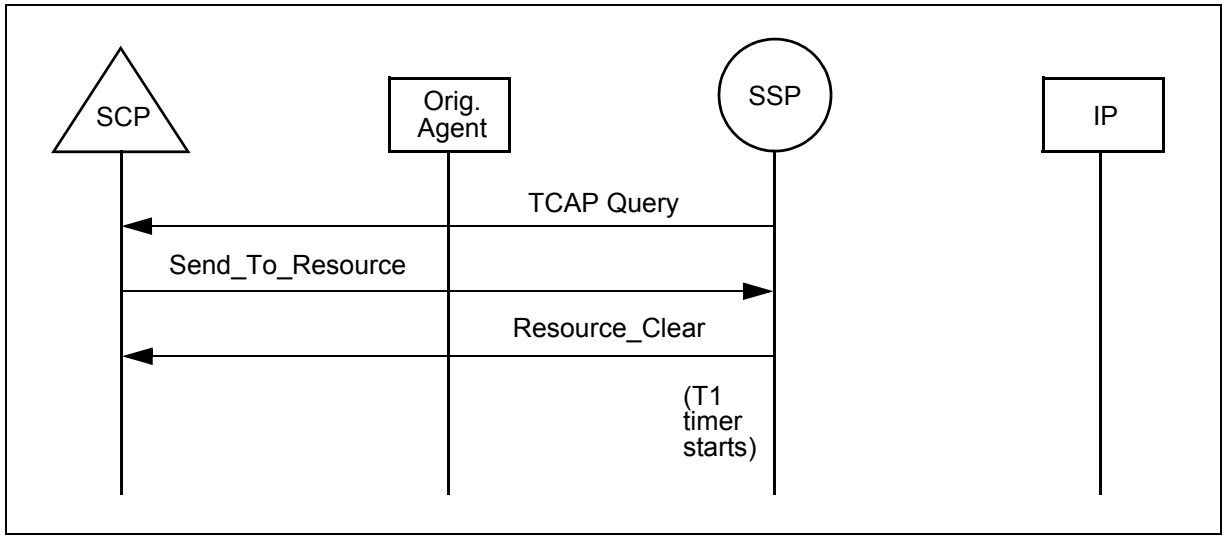
- If a DISConnect message or a RELease COMplete message is received and it contains a Reject component. the SSP sets the ClearCause parameter to "protocolError." *[63]*
- If a DISConnect message or a RELease COMplete message is received and it does not contain a FIE, the SSP sets the ClearCause parameter to "abort." *[64]*

6. The SSP cancels the timer TSTRC (if running). *[61], [62], [63], [64], [65]*
7. Depending on the message type the SSP does the following:
   - If the received message is DISConnect, the SSP releases the facilities seized for the STR connection. See Figure 81 on page 563 . *[61], [62], [63], [64]*
   - If the message is RELease COMplete the STR connection has already been cleared. See Figure 82 on page 564.
8. The SSP does not clear the call to the calling user. *[61 to 65]*

15.5.2 SSP cannot transfer information to IP

This scenario is illustrated in Figure 83.

Figure 83 SSP cannot transfer information to the IP

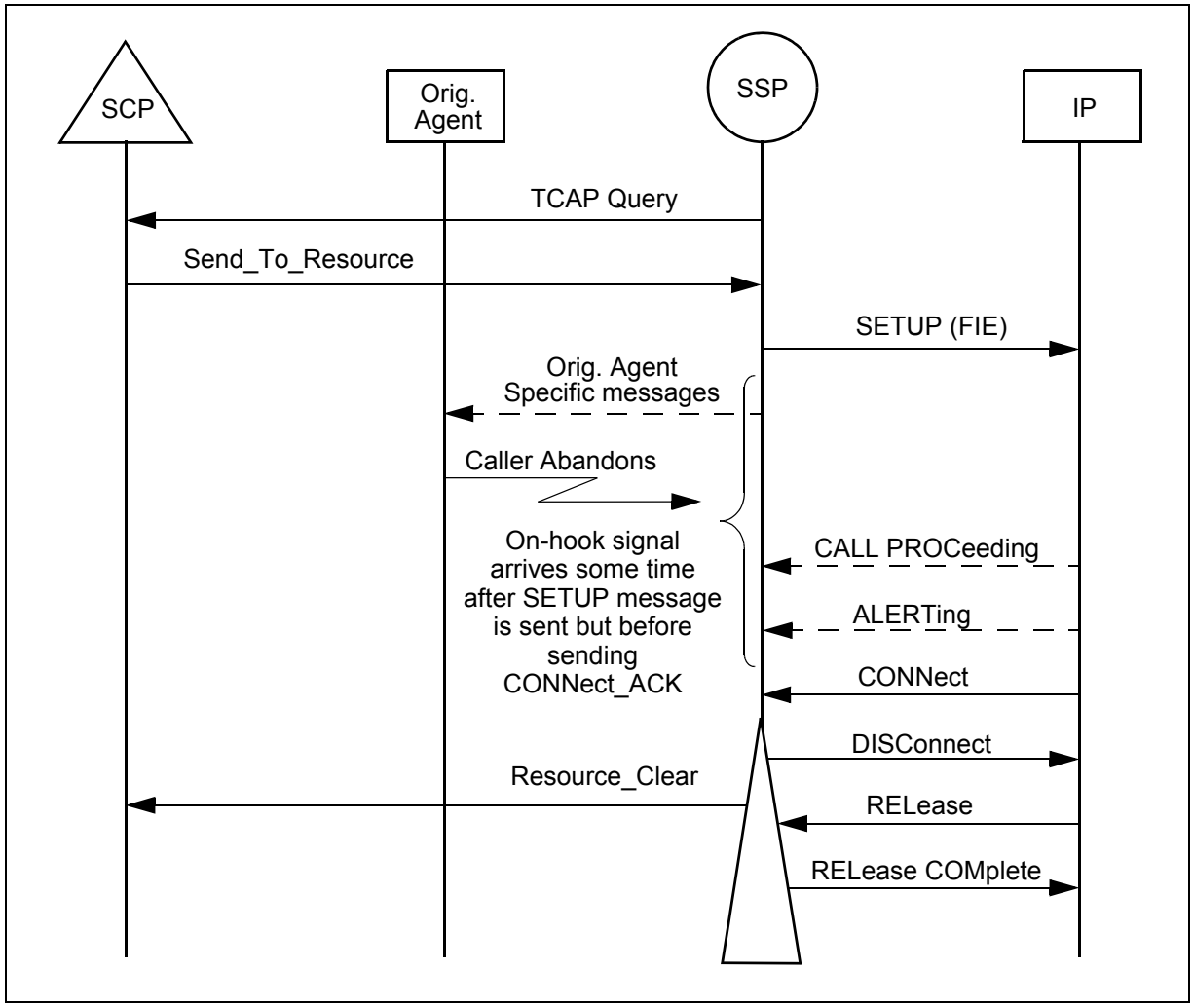


1. The SSP sends a query to SCP or adjunct and receives a Send_To_Resource message (containing a valid DestinationAddress of a Local IP) in a conversation package.
2. The SSP determines that the information received in the STR message cannot be transferred to the IP for the following reasons:
   - The DN does not route to a NTNI PRI trunk with an AIN_IPI_STR option or an ISUP Trunk. *[35]*
   - The STRParameterBlock is too big to transfer to the IP. *[35]*
   - The SSP determines that there is no free channel to the IP. *[36]*
3. The SSP sends a Resource_Clear message to the SCP/Adjunt. The Resource_Clear message is in a Conversation Package and includes the ClearCause parameter containing a value of “abort.” for cases (a) and (b) *[35]* and “channelsBusy.” for case (c) *[36]*
4. The SSP does not clear the call to the calling user. *[35]*

15.5.3 Caller abandons before the STR connection is established

In the following scenario the caller abandons before the STR connection is established (that is, the SETUP message has been sent but CONNect ACKnowledge message has not been sent). See Figure 84 on page 567.

Figure 84 Caller abandons before the STR connection is established



1. The SSP sends a query to SCP or adjunct and receives a Send_To_Resource message (containing a valid DestinationAddress of a Local IP) in a conversation package.
2. The SSP sends a SETUP message to the local IP. *[37]*
3. If necessary, the SSP sends agent specific messages to bring the Orig. Agent to the appropriate state. *[37f]*
4. The caller abandons. (The IP may or may not have responded to SSP with a CONNect message. The IP may have sent CALL PROCeeding and/or ALERTing messages to the SSP before the CONNect message).
5. The SSP clears the STR connection *[41]*

6. The SSP cancels the TSTRC timer. *[41]*
7. The SSP sends a Resource_Clear message to the SCP/Adjunt. The Resource_Clear message is in a Response Package and includes the ClearCause parameter containing a value of "userAbandon." *[41]*

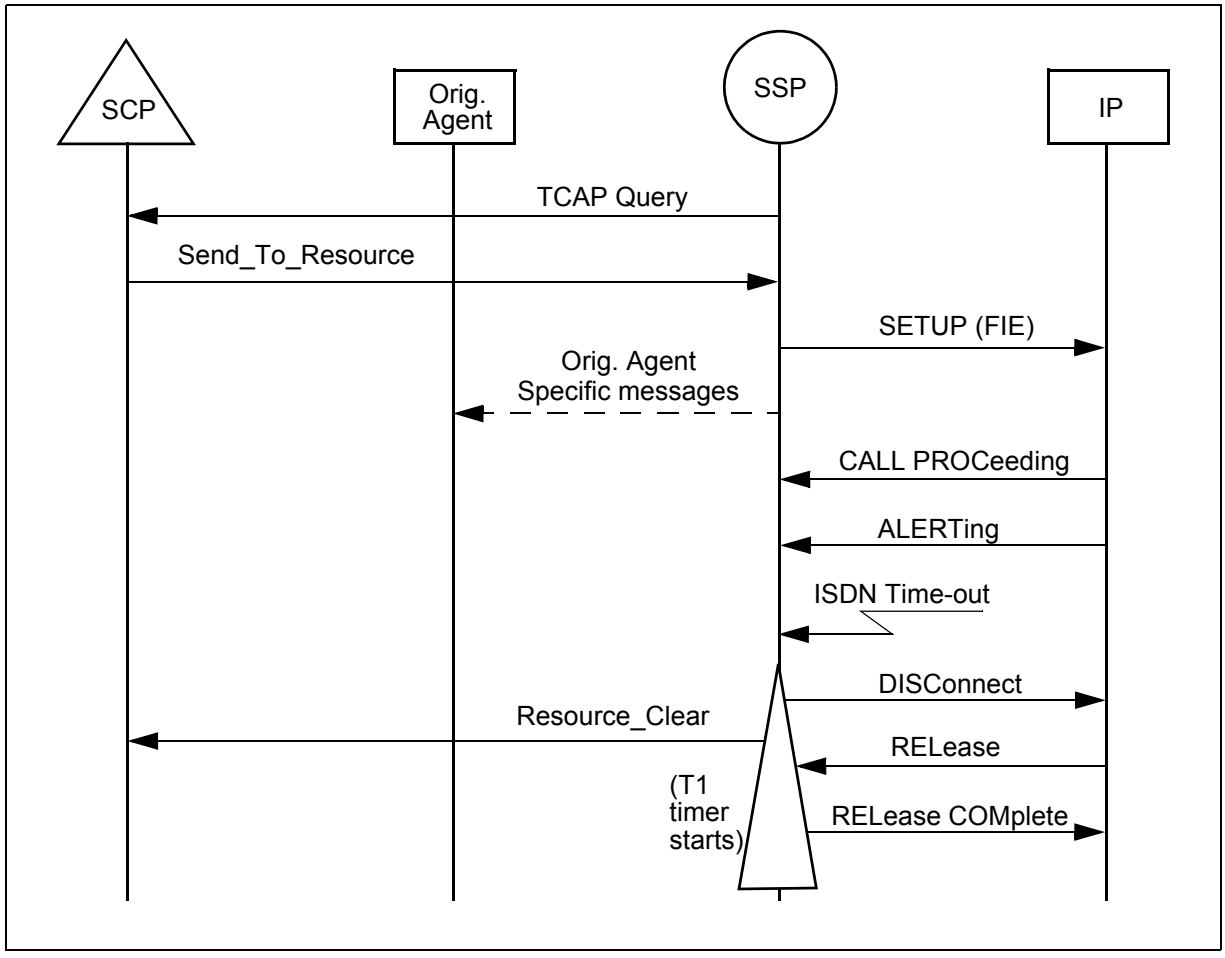
15.5.4 IP does not respond to the SETUP message

The following are possible cases:

- The SSP sends a SETUP message to the local IP. However the SSP does not receive any answer from the IP. See Figure 85.
- Either a CALL PROCeeding or ALERTing or both are received (in response to a SETUP message), but a CONNect message is not received.

Note: Different ISDN timers (T301, T303, T310) time-out for each scenario. This is standard ISDN behavior and is beyond the scope of this activity.

Figure 85 IP does not respond to the SETUP message

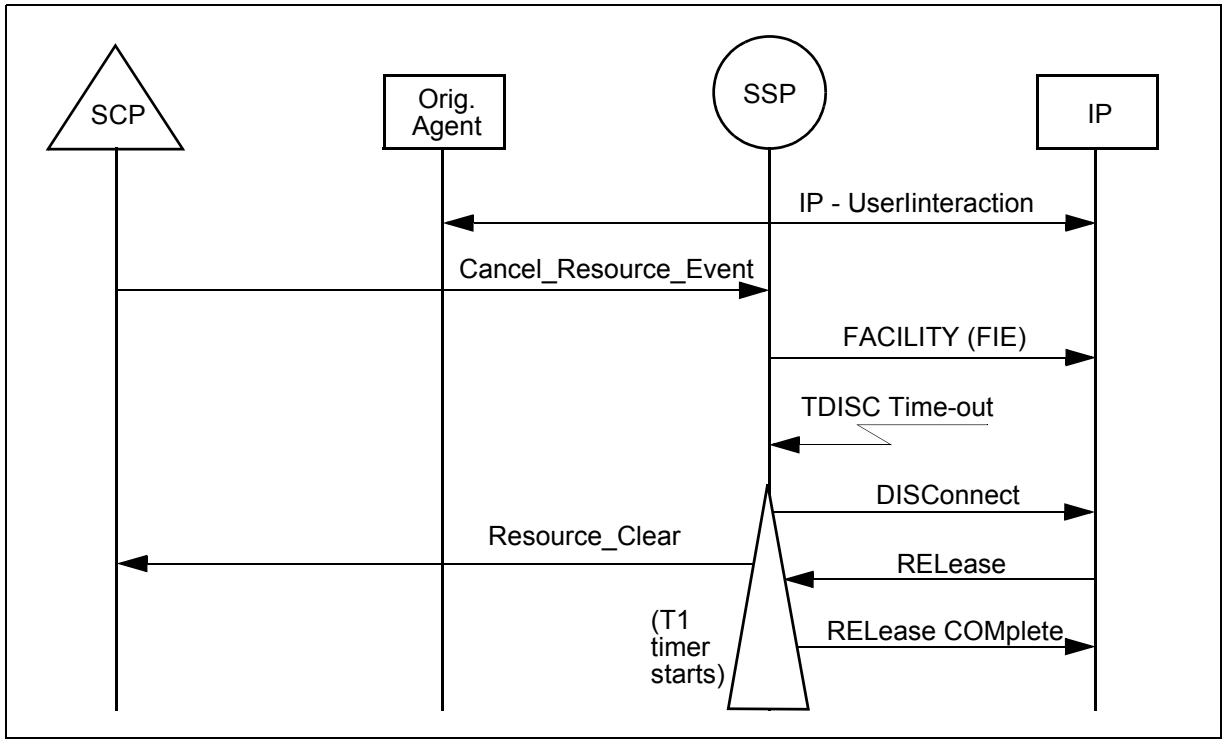


In both cases, the SSP sends a Resource_Clear message to the SCP or adjunct. The Resource_Clear message is in a Conversation Package and includes the ClearCause parameter containing a value of "isdnTimeout." *[40], [43]*

15.5.5 TDISC timer expires during a Cancel_Resource_Event message from the SCP

In the following scenario the SSP receives a Cancel_Resource_Event message from the SCP or adjunct. The SSP sends the local IP a FACILITY message to cancel the IP Resource. However the IP does not reply with a DISConnect message and TDISC timer at the SSP expires. See Figure 86.

Figure 86 TDISC timer expires while processing Cancel_Resource_Event message from SCP



1. There is an active STR connection between the SSP and the IP.
2. The SSP receives a Cancel_Resource_Event message from the SCP or adjunct. The SSP cancels the AIN T1 response timer (if running). *[66v2]*
3. The SSP sends a "cancelIPResource" operation in a FACILITY message to the IP. The SSP stops the timer TSTRC (if running) and starts the timer TDISC to wait for a DISConnect message from the IP. *[66v2]*
4. Timer TDISC expires.

5. The SSP clears the STR connection, but does not clear the call to the calling user. *[72v2]*
6. The SSP sends a Resource_Clear message to the SCP or adjunct in Conversation Package. The Resource_Clear message includes the ClearCause parameter containing a value of "ipTimeout." *[72v2]*

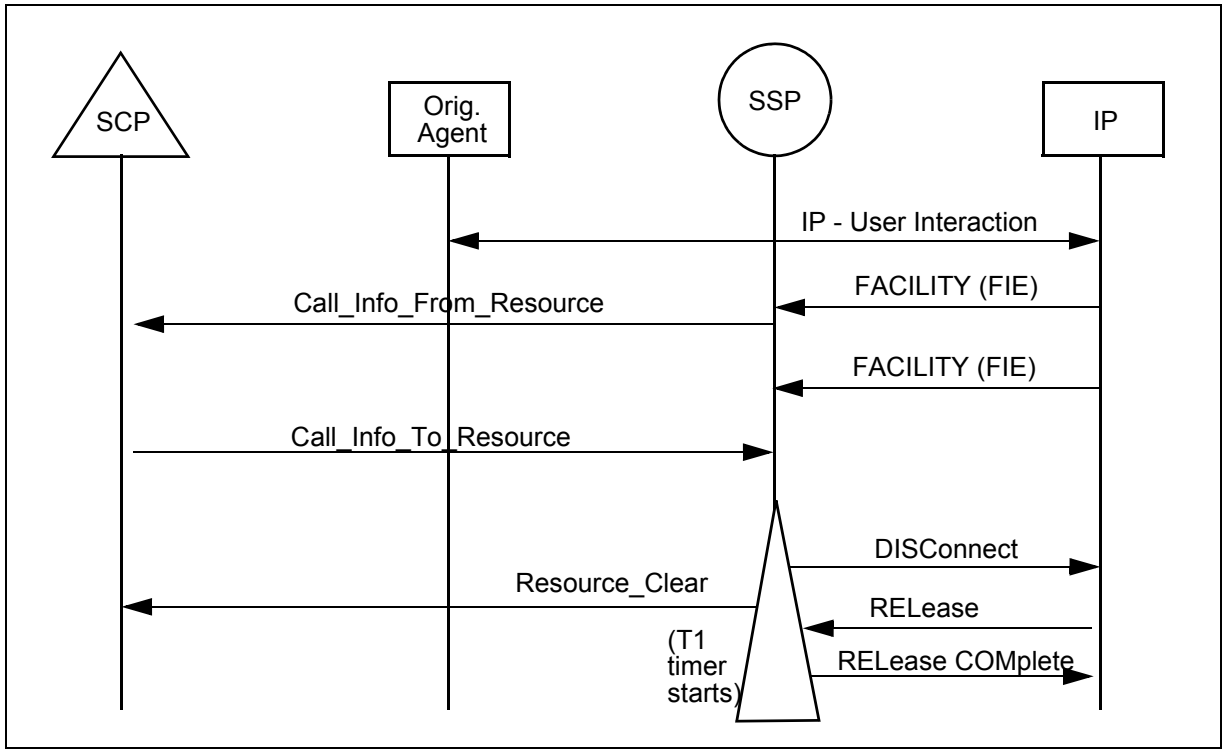
15.5.6 SSP receives an unacceptable FACILITY message from local IP

In the following scenarios, the SSP receives an unacceptable FACILITY message from Local IP during an active STR connection. There are two scenarios:

- FACILITY message while waiting for a CITR message
- Encoding error in a FACILITY message

15.5.6.1 FACILITY message while waiting for a CITR message

Figure 87 Unacceptable FACILITY message from a local IP (case 1)

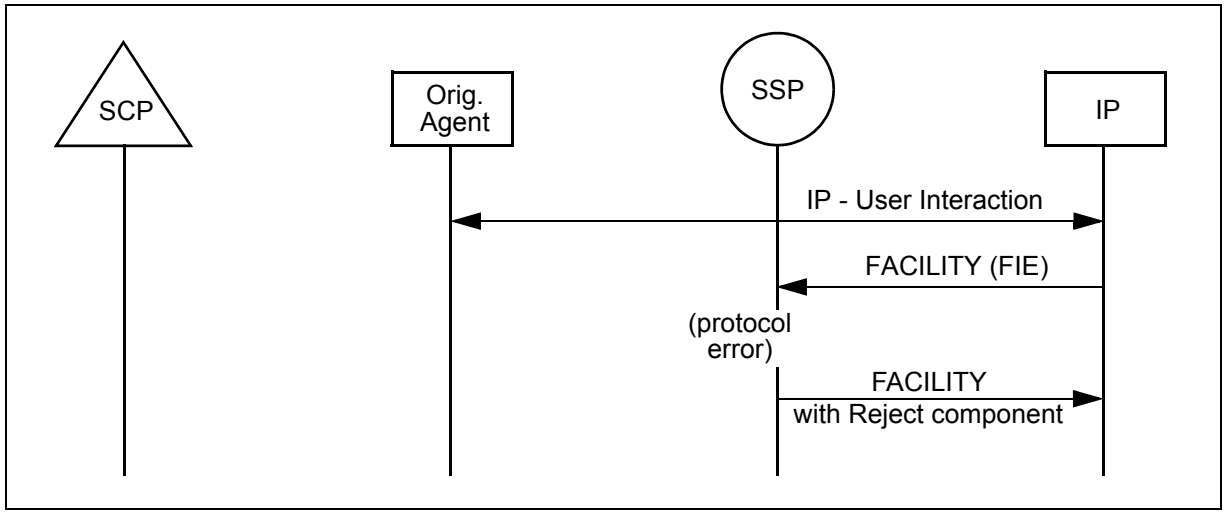


1. There is an active STR connection between the SSP and the IP.
2. The IP sends a FACILITY message to the SSP containing an FIE with a Return Result component. The SSP cannot accept the FACILITY message, because there is an outstanding Call_Info_To_Resource message for the last Call_Info_From_Resource message for this STR connection.

3. The SSP waits for the CITR message from the SCP. Then it sends a Resource_Clear message to the SCP. The Resource_Clear message is in a Conversation package and includes the ClearCause parameter containing a value of “protocolError”.
4. The SSP clears the STR connection to the IP, and releases the Invoke identifier; but does not clear the call to the calling user. *[52]*

15.5.6.2 Encoding error in a FACILITY message

Figure 88 Encoding error in a FACILITY message

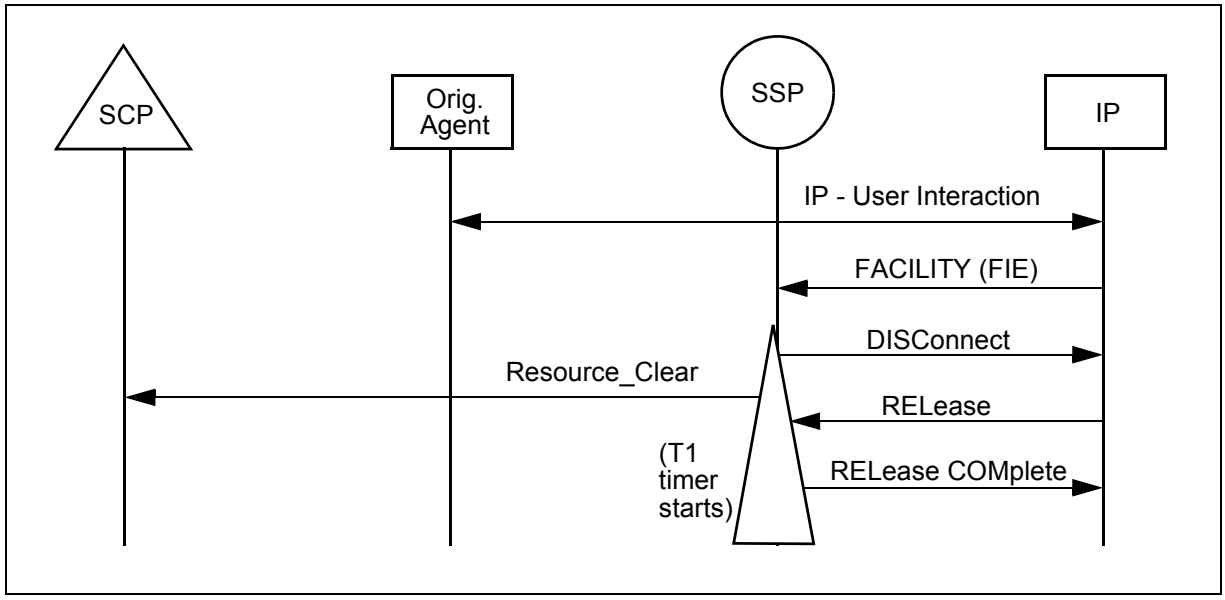


1. The IP sends a FACILITY message with an encoding error or an unrecognized operation ID, to the SSP.
2. There is no outstanding Call_Info_To_Resource message for the last Call_Info_From_Resource message, if any, for this STR connection. *[49]*
3. The SSP sends a Reject component to the IP in a FACILITY message with the Problem Value containing Invoke-problem, “unrecognized operation”.

15.5.7 SSP receives a reject component in a FACILITY message from local IP

In the following scenario, the SSP receives an acceptable FACILITY message containing a Reject component. The Reject component contains a parameter that indicates the reason for rejection. See Figure 89 on page 572.

Figure 89 SSP receives Reject component ina FACILITY message from a local IP

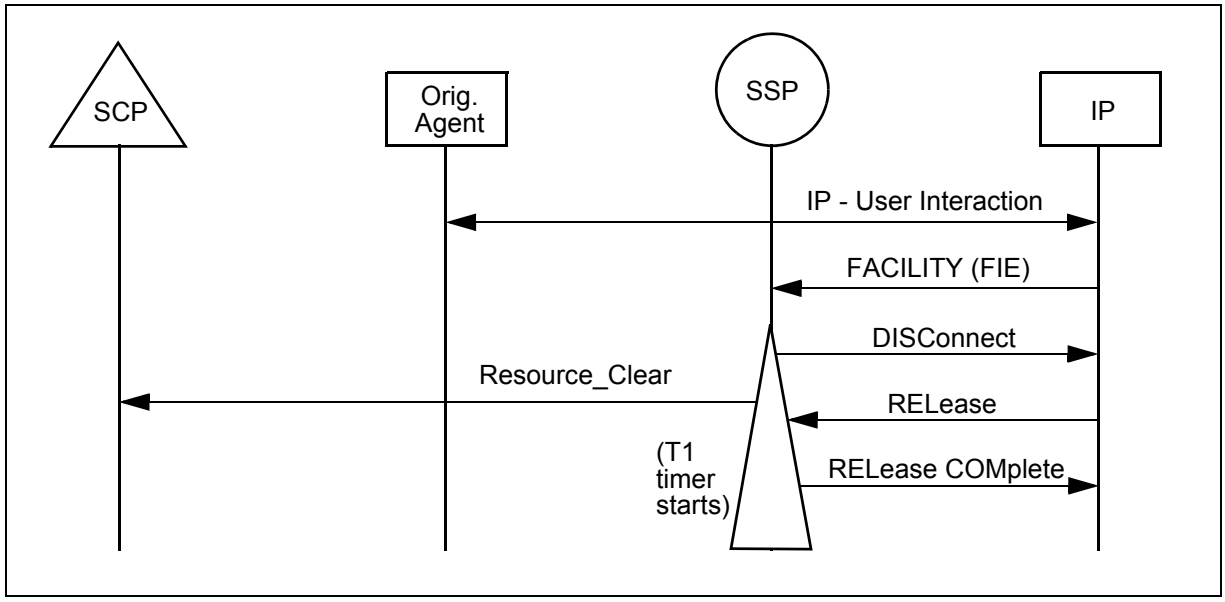


1. While the STR connection is active, the SSP receives a FACILITY message from the IP. The FACILITY message contains a Reject component *[55]*
2. The SSP sends a Resource_Clear message to the SCP or adjunct. The Resource_Clear message is in Conversation Package and includes the ClearCause parameter containing a value of “protocolError.” *[55]*
3. The SSP clears the STR connection to the IP; but does not clear the call to the calling user. *[55]*

15.5.8 SSP receives a return error component in a FACILITY message from local IP

In the following scenario, the SSP receives an acceptable FACILITY message containing a Return Error component. See Figure 90 on page 573.

Figure 90 SSP receives Return Error component in FACILITY message

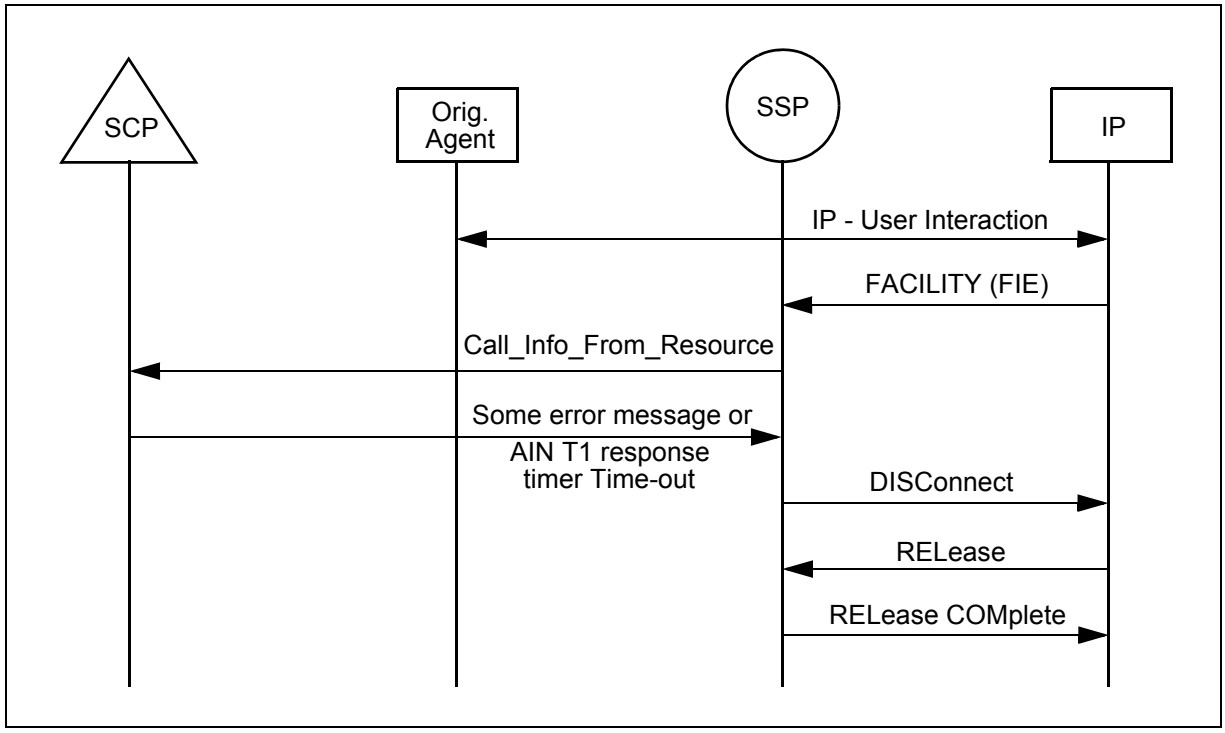


1. While the STR connection is active, the SSP receives a FACILITY message from the IP. The FACILITY message contains a Return Error component. *[56]*
2. The SSP sends a Resource_Clear message to the SCP or adjunct. The Resource_Clear message is in Conversation Package and includes the ClearCause parameter. The SSP maps the Error value from the Return Error component to the ClearCause value. If an error parameter is included in the Return Error component of the DISConnect message, the Resource_Clear message contains a ClearCauseData parameter that contains the error parameter. *[56]*
3. The SSP clears the STR connection to the IP; but does not clear the call to the calling user. *[56]*

15.5.9 SSP does not receive a valid reply from the SCP in response to a Call_Info_From_Resource message

In the following scenario, the SSP receives a valid FACILITY message from Local IP during an active STR connection. The SSP passes the information to the SCP in a Call_Info_From_Resource message. The SCP does not reply to the SSP or replies with an error message. See Figure 91 on page 574.

Figure 91 SSP does not receive Call_Info_To_Resource message from the SCP



1. The IP sends a FACILITY message to the SSP:
2. There is no outstanding Call_Info_To_Resource message for the last Call_Info_From_Resource message, if any, for this STR connection. *[49]*
3. The SSP sends a Call_Info_From_Resource message to the SCP or adjunct in a Conversation Package. The SSP includes the Call_Info_From_Resource message in an Invoke (Not Last) component correlated to the Invoke (Last) component received in the Send_To_Resource message. The SSP also includes the optional parameter IPReturnBlock in the Call_Info_From_Resource message if this parameter is included in the FIE. *[50]*
4. Upon sending the Call_Info_From_Resource message to the SCP or adjunct, the SSP starts the AIN T1 response timer. *[51]*
5. The SCP does one of the following *[60]*
   - sends no reply to the SSP (AIN T1 response timer expires)
   - sends an Abort Package with a Responding Transaction Identifier that corresponds to the Call_Info_From_Resource message
   - sends an Application_Error or Failure_Report message in a Response Package in response to the Call_Info_From_Resource message.
   - sends a Response Package with a Reject component in response to the Call_Info_From_Resource message.

6. The SSP clears the STR connection and cancel the timer TSTRC. *[60]*
7. The SSP provides AINF treatment to the calling user. *[60]*

16 STR connection to a remote IP

This chapter documents Send_To_Resource processing with a remote IP; that is FS-4-5. These scenarios illustrate the topology where both the local and the remote SSPs are DMS-100 switches supporting AIN Service Enablers, unless otherwise stated. This is for ease of documentation only and does not represent a network requirement.

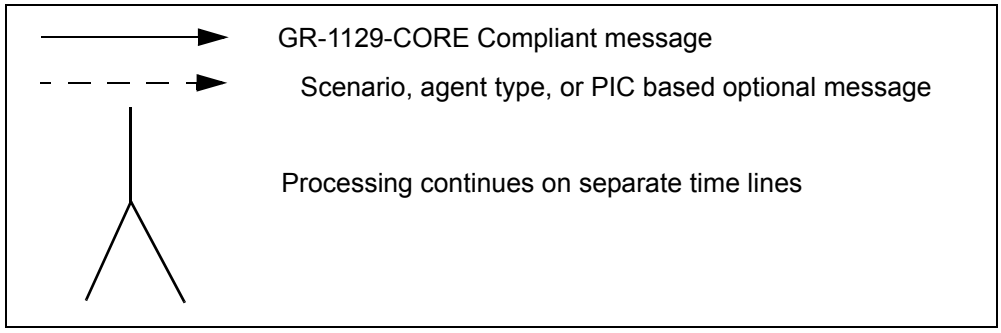
This chapter is divided as follows:

- notational conventions
- STR connection setup; FSS-4-5-1, FSS-4-5-2 and FSS-4-5-3
- intermediate information exchange with a remote IP; FSS-4-5-4, FSS-4-5-5 and FSS-4-5-6
- STR connection clearing; FSS-4-5-7, FSS-4-5-8 and FSS-4-5-9
- exception and error scenarios for remote IP configuration
- routing to a remote IP

16.1 Notational conventions

In this chapter, GR-1129-CORE, Issue 2, requirement numbers related to the steps in the scenarios below are indicated with global requirement numbers in italic within square brackets (for example, *[35]*). Behaviour tht is noncompliant with GR-1129-CORE, Issue 2, is noted in a compliance note where it occurs.

Figure 92 Legend used in the message sequence charts (MSC)

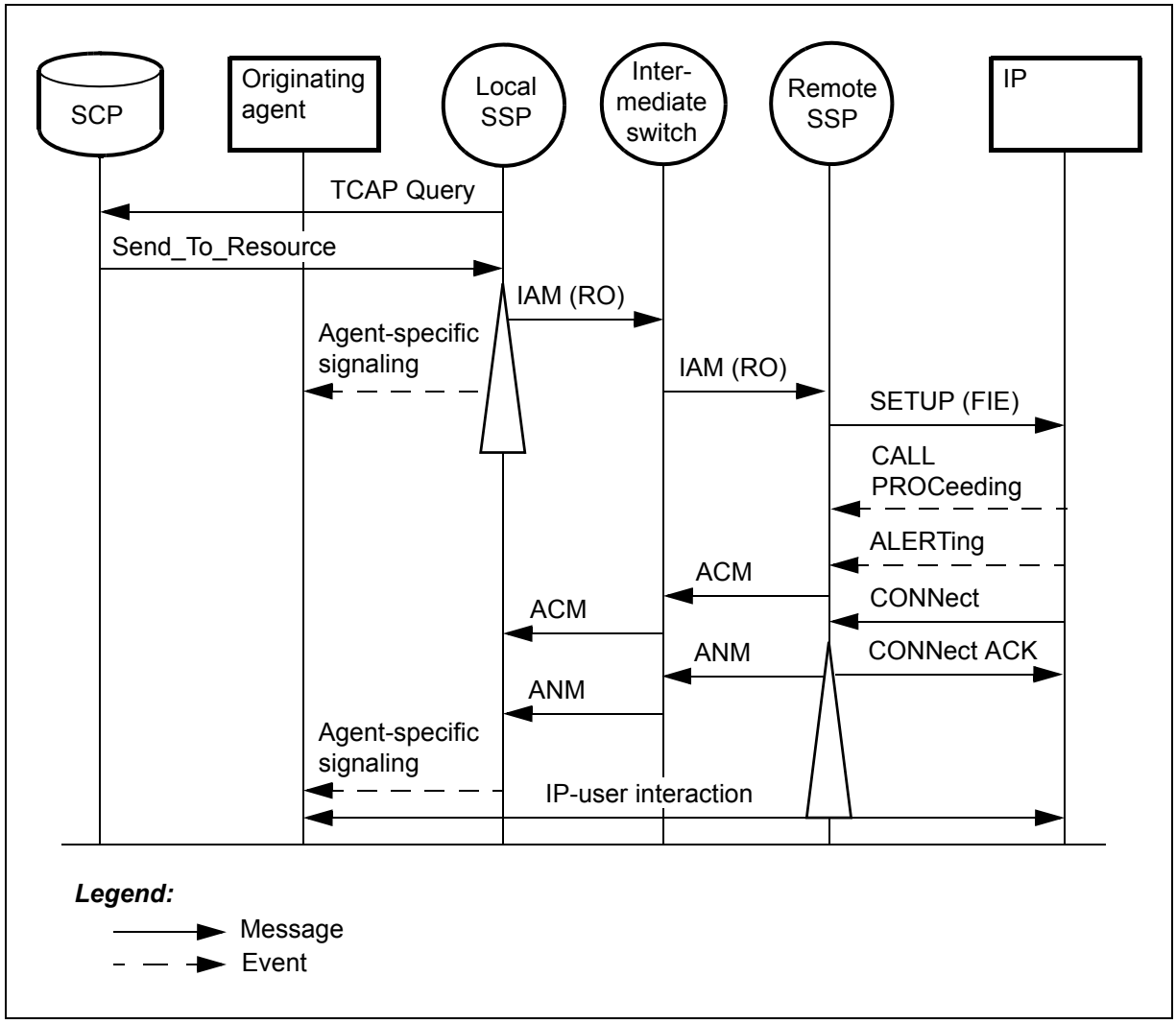


16.2 STR connection setup

This function covers the following functional subsets: FSS-4-5-1, FSS-4-5-2 and FSS-4-5-3.

In the following scenario the Local SSP receives a Send_To_Resource with the DestinationAddress of a remote IP. See Figure 93 on page 579.

Figure 93 Successful connection to a remote IP



1. The local SSP establishes a trunk connection to the remote SSP where the remote IP resides. It follows the call establishment procedures for a local exchange, and forms an IAM including the following parameters: *[82]*
   - Forward Call indicator
   - User service information
   - Called party number
   - Calling party number
   - An RO parameter containing an Invoke component.
   - OriginalCalledParty and RedirectingNumber (if the call is redirected)
2. The SSP signalling towards the originating agent depends on the agent type, and the Point in Call (PIC) from which the local SSP received the

STR message. *[83]*

3. The intermediate switch receiving the IAM selects an outgoing circuit and passes on the IAM regardless of whether or not it recognizes the RO parameter. *[86], [87]*
4. The remote SSP receives the IAM message and sends a SETUP message to the remote IP. *[90]*
5. The remote SSP waits for the remote IP's reply message(s). *[92]*

   Note: After the remote SSP sends the SETUP message to the remote IP, the message flow between the remote SSP and remote IP, when establishing an STR connection, is the same as that between a local SSP and a local IP. *[92]*.

6. If the remote SSP receives a CALL PROCeeding or an ALERTing message from the remote IP, the remote SSP interworks this message into an ISUP ACM message. *[92]*
7. The intermediate switch receives and forwards the ISUP ACM message to the local SSP (or another intermediate switch). *[89]*
8. The local SSP consumes the ISUP ACM message.
9. The remote SSP receives a CONNect message from the remote IP. The remote SSP sends an ISUP ANM message to the local SSP (or the intermediate switch). *[91]*
10. The intermediate switch receives and forwards the ISUP ANM message to the local SSP (or another intermediate switch). *[89]*
11. The local SSP receives the ISUP ANM message and provides treatment to the user, depending on the agent type and the PIC from which the local SSP received the STR message. *[85]*
12. The SSP cuts through the connection in both directions to permit the exchange of in-band information between the user and the remote IP. *[85]*

Refer to 11.4.2 for a description of TSTRC Timer operation.

16.3 Intermediate information exchange with a remote IP

This function covers the following functional subsets: FSS-4-5-4, FSS-4-5-5 and FSS-4-5-6.

This section describes the ability of the SSP to signal an IP or intermediate switch during an active STR connection to a remote IP to exchange information.

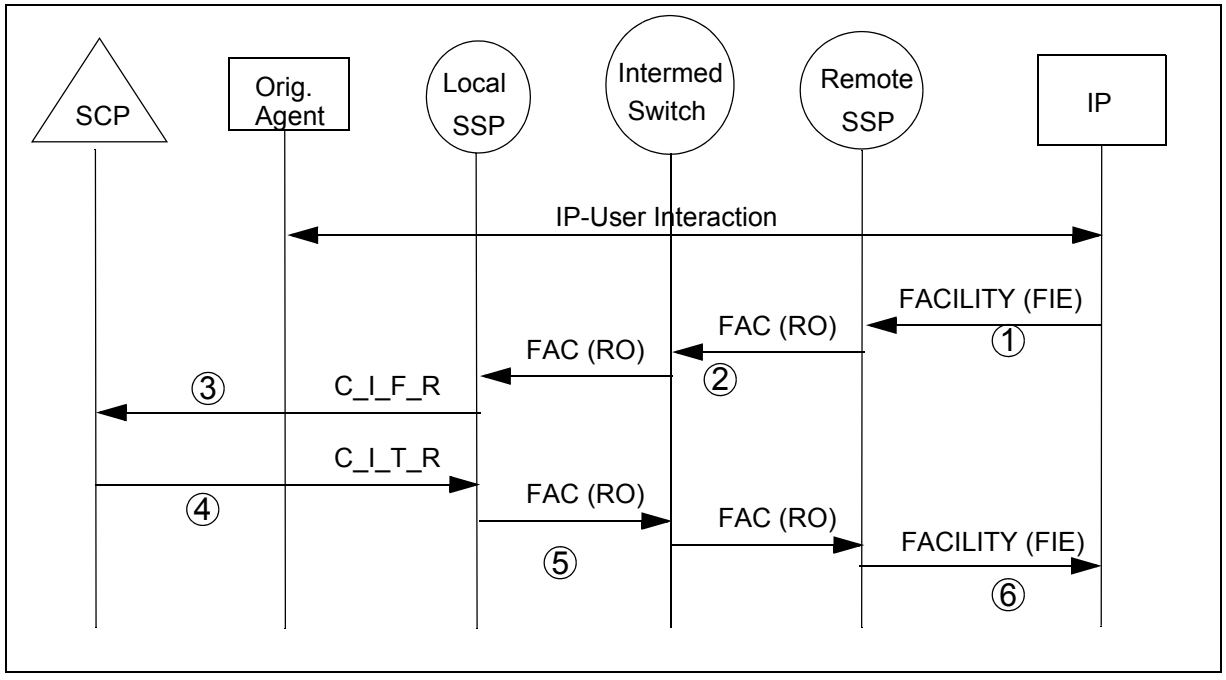
16.3.1 Intermediate information exchange between SCP and remote IP

The term Intermediate Information refers to the case in the information collected from the user by the IP is sent to the SCP and the STR connection is maintained in anticipation of further interactions.

For the remote IP configuration, this information exchange consists of the following steps, illustrated in Figure 94 on page 581.

1. The remote IP passes collected information to the remote SSP in the FIE of an ISDN access FACILITY message.
2. The remote SSP passes this information to the local SSP in the RO parameter of an ISUP Facility (FAC) message.
3. The local SSP sends the information to the SCP in a Call_Info_From_Resource (CIFR) message.
4. In response, the SCP/Adjunct normally sends a Call_Info_To_Resource (CITR) message to the local SSP.
5. The local SSP sends a FAC message to the remote SSP. The RO parameter contains the information from the Call_Info_To_Resource message.
6. The remote SSP passes the information to the remote IP in the FIE of an ISDN access Facility message.

Figure 94 Intermediate information exchange between SCP and remote IP



16.3.1.1 Detailed description

1. The remote SSP receives an ISDN Facility message containing an FIE with a Return Result Component and a “sendToIPResource” Operation Value.
   - The remote SSP does not detect any protocol errors in the ISDN access Facility message
   - The remote SSP checks that prior to receiving the ISDN access Facility message, it has received an ISUP FAC message for each previous ISDN access Facility message. ISUP FAC messages must contain an RO parameter with an Invoke component and a sendToIPResource Operation Code. ISDN access Facility messages must contain a FIE with a ReturnResult component and a sendToIPResource Operation Value.
2. The remote SSP forms and sends a FAC message (containing an RO parameter) to the local SSP (or to an intermediate switch), as specified below [93]

   The RO parameter contains a Return Result component that must contain the Invoke ID Information Element parameter

   If the Return Result Component of the ISDN access Facility message contains a Results Data Element, the Return Result component of the FAC message must also contain the following:
   - Sequence Information Element
   - Operations Code Information Element (with a “global” Operation Code Tag and a “SendToIPResource” Operation Code)
   - Parameters Information Element: The Parameter Information Element includes the IPReturnBlock parameter if it is included as an argument in the FIE of the ISDN access Facility message
3. The intermediate SSP receives a FAC message (containing RO parameter) from an outgoing trunk and tandems it to the incoming trunk, regardless of whether or not it recognizes the RO parameter. *[94]*
4. The local SSP receives a FAC message containing an RO parameter with a Return Result component and a “sendToIPResource” Operation Code, it forms and sends a Call_Info_From_Resource message to the SCP in a Conversation Package. The Call_Info_From_Resource message contains the following: *[95]*
   - Invoke (Not Last) component correlated to the Invoke component of the Send_To_Resource message that the local SSP previously received from the SCP/Adjunct for this STR connection.
   - IPReturnBlock parameter if it is included in the Parameters Information Element from the Return Result component of the FAC message’s RO parameter.

5. Upon sending a Call_Info_From_Resource message to the SCP, the local SSP starts the AIN T1 response timer and waits for further information from the SCP. *[96]*
6. The local SSP receives a Call_Info_To_Resource message with a Return Result component and cancels the AIN T1 response timer. It then forms and sends a FAC message containing an RO parameter to the remote SSP (or to an intermediate SSP). The RO parameter contains an Invoke component, which contains the following *[97]*
   - Invoke ID Information Element,
   - Operation Code Information Element (with a “global” Operation Code tag) and a “sendToIPResource” Operation Code),
   - Parameters Information Element. The Parameter Information Element includes the ResourceType and STRParameterBlock parameters if they are present in the Call_Info_To_Resource message.
7. The intermediate SSP receives a FAC message (containing an RO parameter) for an incoming trunk and tandems it to the outgoing trunk, regardless of whether or not it recognizes the RO parameter. *[98]*
8. The remote SSP receives a FAC message containing an RO parameter with an Invoke component and a “sendToIPResource” Operation Code, it forms and sends an ISDN access FACILITY message with an FIE to the remote IP. The FIE contains an Invoke component with the information form the Invoke component of the FAC message’s RO parameter The Results Data Element of the FIE contains the ResourceType and StrParameterBlock parameters if they are present in the Parameters Information Element of the FAC message.*[99]*

Refer to 11.4.2 for a description of TSTRC Timer operation.

16.4 STR connection clearing

This function covers the following functional subsets: FSS-4-5-7, FSS-4-5-8 and FSS-4-5-9.

This section describes STR connection clearing under the following headings

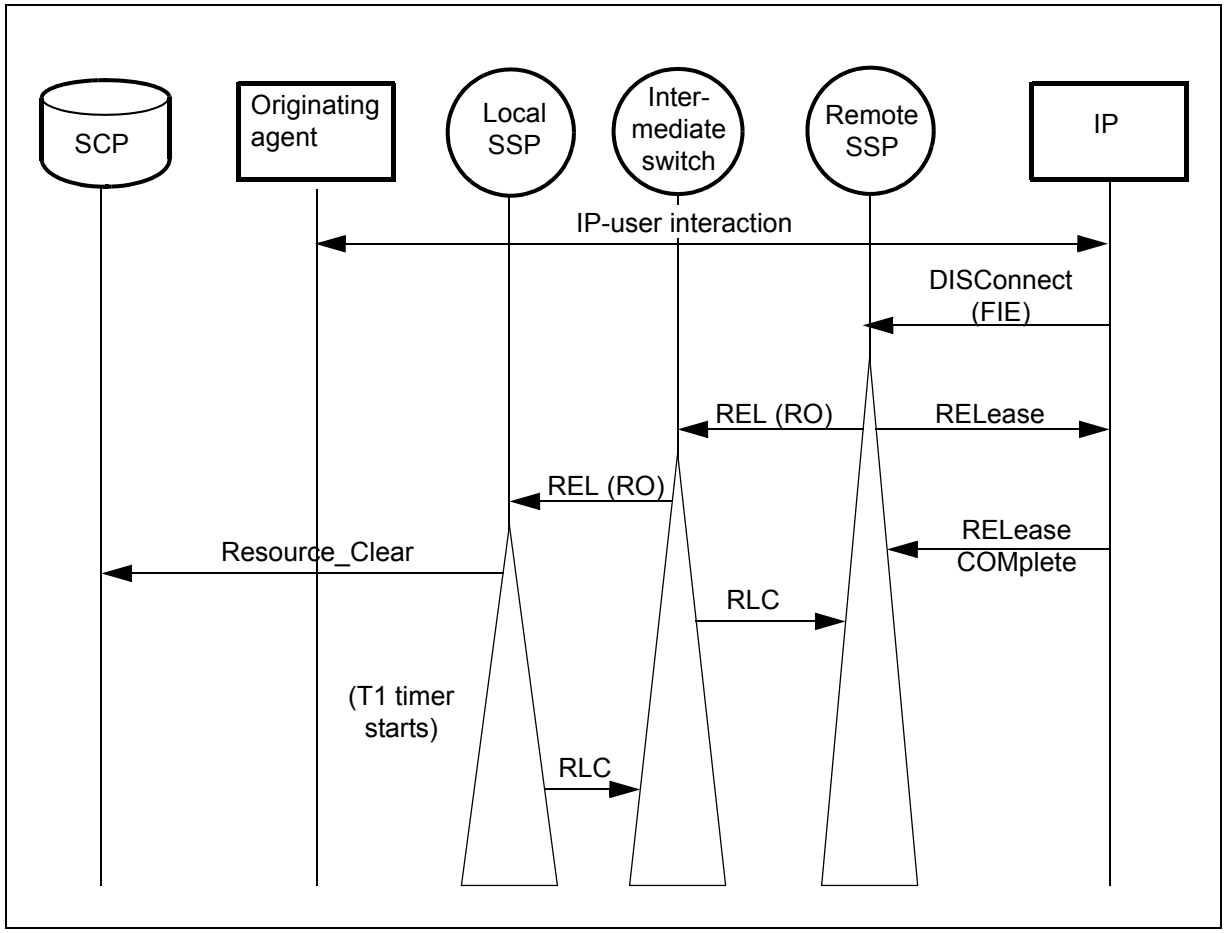
- IP-initiated clearing of a remote STR connection
- Cancel Resource Event in a Remote IP Configuration
- Caller abandon
- TSTRC timer expires at a remote SSP

16.4.1 IP-initiated clearing of STR connection

In the following scenario the remote IP starts a normal disconnect. The message flow for the remote IP (initiating normal disconnect and passing final

information to the remote SSP) is the same as the message flow for a local IP initiating normal disconnect and passing final information to the local SSP. See Figure 95 on page 584.

Figure 95 Successful release from a remote IP



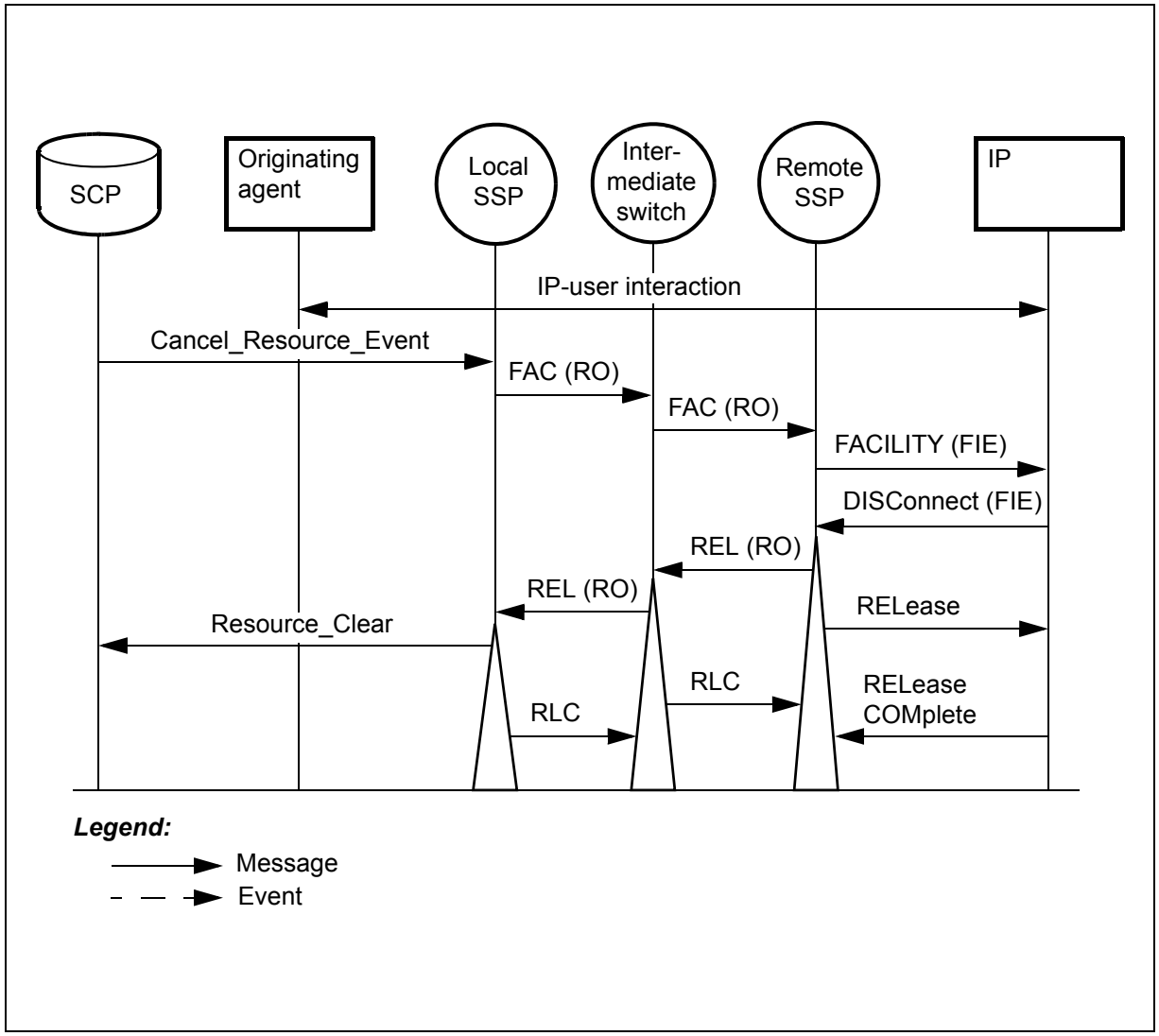
1. The IP decides to clear the STR connection and sends a DISConnect message to the SSP. The DISConnect message contains a Return Result, Return Error or Reject component. *[61], [62], [63], [64]*
2. The remote SSP receives the DISConnect message. The remote SSP forms and sends an ISUP REL to the local SSP (or intermediate switch). The ISUP REL message contains an RO parameter if the DISConnect message contains an FIE. *[100]*
3. The intermediate switch receives and forwards the REL message to the local SSP (or to another intermediate switch) regardless of whether or not the intermediate switch recognizes the RO parameter. *[101], [102]*
4. The intermediate switch frees the circuit by sending an RLC to the remote SSP (or to another intermediate switch). *[103]*

5. The local SSP receives the REL message and returns a RLC message for the circuit. In addition, the local SSP sends a Resource_Clear message with clearCause=normal to the SCP or adjunct. The local SSP does not clear the call to the user. *[104]*
6. The remote SSP receives the RLC. *[100-4]*.

16.4.2 Cancel Resource event in a remote IP configuration

When the local SSP receives a Cancel_Resource_Event message, while the IP and the user are interacting, it sends an ISUP FAC message, containing an RO parameter with the "CancelIPResource" Operation Code, indicating the desire to disconnect the remote IP.

Figure 96 Local SSP initiated clearing of STR connection to remote IP



16.4.2.1 Detailed description

1. The local SSP receives a Cancel_Resource_Event message from the SCP. It cancels the AIN T1 response timer (if running) and initiates the release of the STR connection to the remote SSP by sending a FAC message with an RO parameter. The RO parameter contains an Invoke component which contains the following:*[105]*
   - Invoke ID Information Element,
   - Operation Code Information Element (with a “global” Operation Code Tag and a “cancelIPResource” Operation Code).
2. If after sending a FAC message, the local SSP receives a response message from the SCP, before receiving a REL message, discards the response message. *[107]*
3. The intermediate switch receives the FAC message and tandems it, regardless of whether or not it recognizes the RO parameter. *[94]*
4. The remote SSP receives the FAC message that contains an RO parameter with an Invoke component and a “CancelIPResource” Operation Code, it takes one of the following actions: *[111]*
   - If the STR connection to the remote IP has not yet been established (that is, the SCP sent the Cancel_Resource_Event message after the remote SSP received the IAM but before it sends the remote IP an ISDN access CONNect ACKnowledge message), the remote SSP
     — cancels timer TSTRC (if running),
     — clears the STR connection to the remote IP,
     — releases the Invoke ID, and
     — initiates the release of the connection to the local SSP by sending a REL message.
   - If the STR connection to the remote IP has been established (that is, the SCP sent a Cancel_Resource_Event message after the remote SSP sent the remote IP an ISDN access CONNect ACKnowledge message), the remote SSP
     — starts the Disconnect timer TDISC, and
     — forms and sends an ISDN FACILITY message with an FIE to the remote IP.

     This is the scenario illustrated in Figure 96 on page 585.
5. The remote SSP receives an ISDN access DISConnect message, and processes it as follows: *[112]*
   - cancel the Disconnect timer TDISC, if running, *[112]*
   - release the Invoke ID *[100]*

- cancel timer TSTRC (if running) *[100]*
- release the connection to the local SSP by sending a REL message, with the following additions: *[100]*
  - If the ISDN DISConnect message contains an FIE with a Return Result component and a “sendToIPResource” Operation Value, the REL message contains an RO parameter. The RO parameter contains a Return Result component.
  - If the Return Result component of the ISDN DISConnect message contains a Results Data Element, the Return Result component of the REL message also contains a Sequence Information Element, an Operation Code Information Element (with a “global” Operation Code Tag and a “sendToIPResource” Operation Code), and a Parameters Information Element. The Parameters Information Element includes the IPReturnBlock parameter if it is included as an argument in the FIE of the ISDN access DISConnect message.
  - If the remote SSP receives an ISDN DISConnect message that does not contain an FIE, it sends a REL message without an RO parameter.
  - The coding of the cause parameter within the REL message is General location: “user”; Cause value: “normal clearing”.
  - If the remote SSP receives an ISUP Release Complete (RLC) message, it cancels the appropriate release timers, if active, and idles the incoming circuit.

6. The intermediate switch receives a REL message (containing an RO parameter) and tandems it, regardless of whether or not it recognizes the RO parameter. *[102]*
7. The intermediate switch sends an RLC message towards the remote SSP..
8. The local SSP receives a REL message and proceeds as follows: *[109]*
   - cancels the appropriate release timers, if active, *[104]*
   - releases and idles the outgoing circuit by sending an RLC message *[104]*
   - If the REL message contains an RO parameter with a Return Result component, the local SSP forms and sends a Resource_Clear

message in a Conversation Package, to the SCP, with following parameters: *[104], [109]*

— ClearCause = “resourceCancelled”,

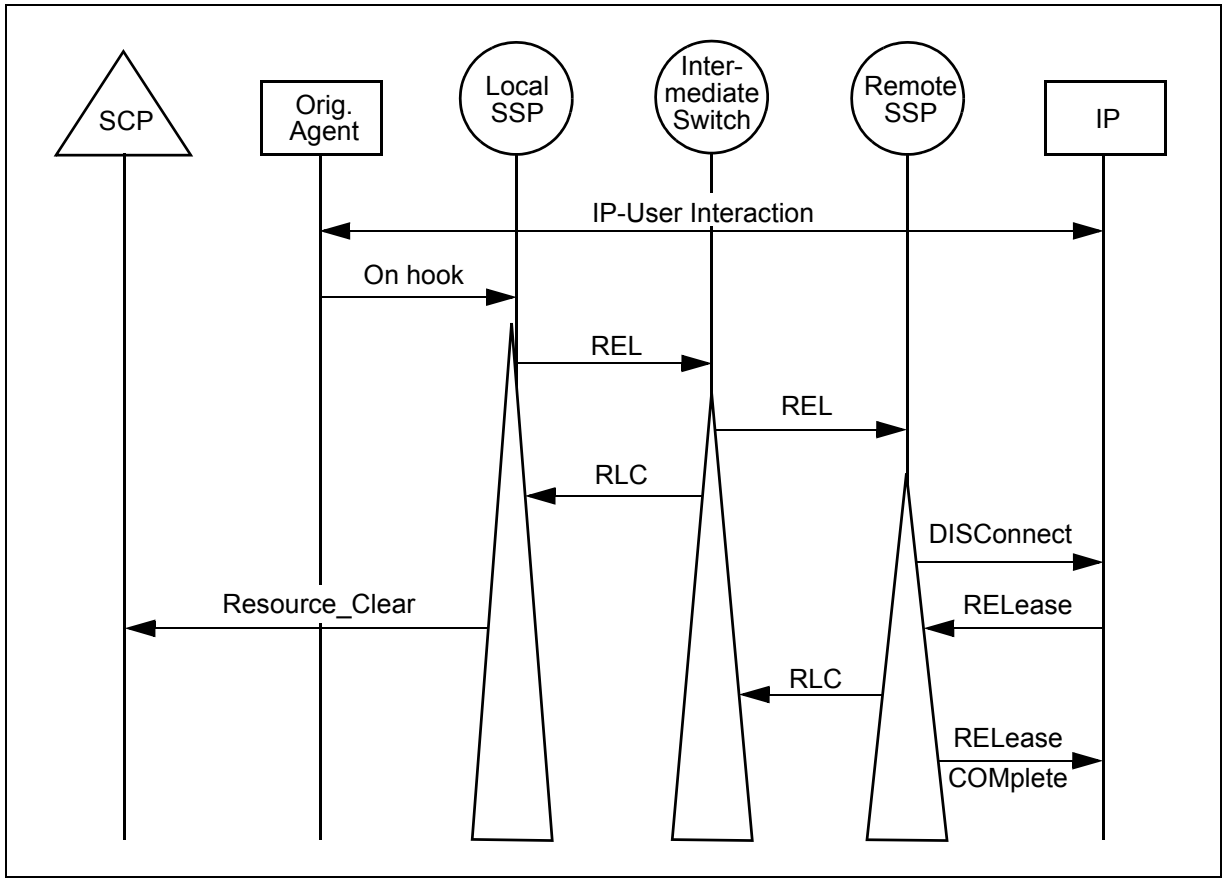
— IPReturnBlock parameter (if it is present in the Parameters Information Element of the REL message).

- If the REL message does not contain an RO parameter, the local SSP forms and sends a Resource_Clear message in a Conversation Package. with ClearCause = “resourceCancelled”, to the SCP. *[104], [109]*
- The local SSP does not clear the call to the user. *[104]*

16.4.3 Caller abandons

In the following scenario the caller abandons while there is an active STR connection to a remote IP. Figure 97 on page 589 shows how the current implementation works.

Figure 97 Caller abandon



1. The local SSP detects that the user abandoned the call.
2. The local SSP sends an ISUP REL message to the remote SSP (or to the intermediate switch).

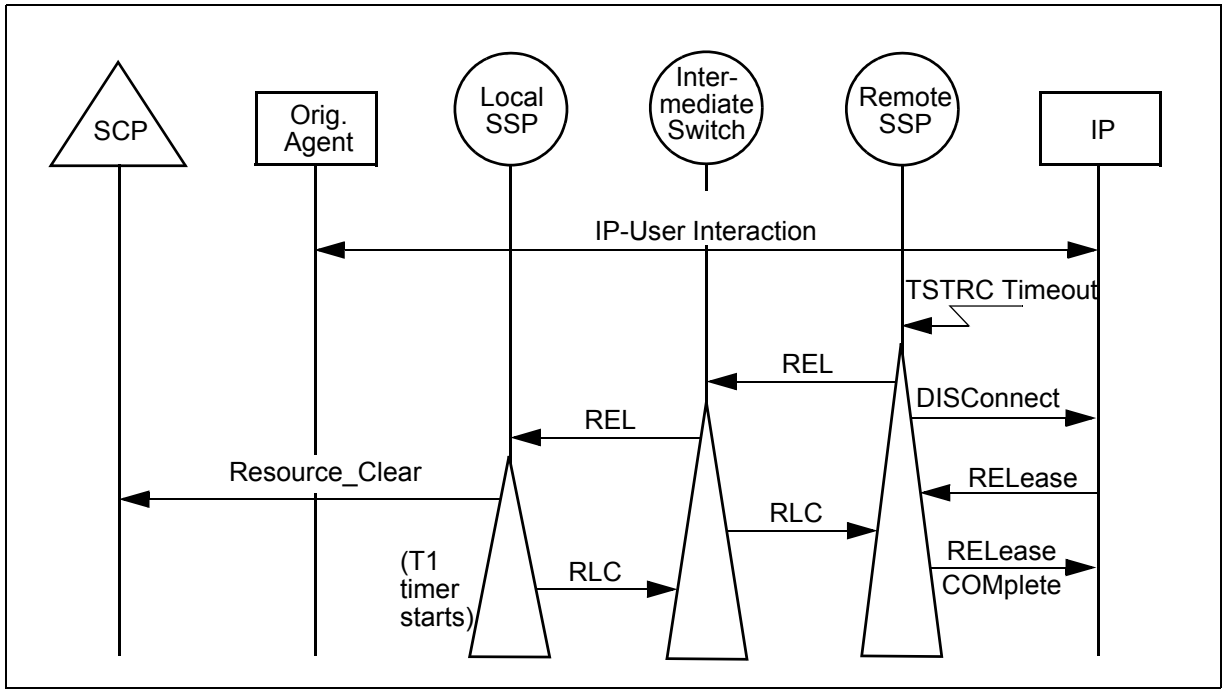
   Compliance note: The local SSP handling is noncompliant with GR-1129-CORE, Issue 2. Therefore the remainder of the scenario is noncompliant with GR-1129-CORE, Issue 2.

   The local SSP also sends a Resource_Clear message to the SCP or adjunct with a “userAbandon” ClearCause.
3. The intermediate switch receives the ISUP REL message and sends it to the remote IP. The intermediate switch also sends an ISUP RLC message to the local SSP.
4. The remote SSP receives the ISUP REL message and sends a RELease message to the remote IP. *[114]*
5. The remote SSP receives a RELease COMplete message from the IP.
6. The remote SSP sends an ISUP RLC message to the local SSP (or to the intermediate switch).

16.4.4 TSTRC timer expires at a remote SSP

The remote SSP initiates the TSTRC timer for an STR connection after receiving a CONNect message from an IP. If this timer expires before the remote SSP receives a DISConnect or RELease COMplete message from the IP, the remote SSP notifies the local SSP and clears the STR connection. See Figure 98.

Figure 98 TSTRC timer expires at remote SSP



1. Timer TSTRC expires at remote SSP.
2. The remote SSP clears the STR connection and releases the Invoke identifier. *[150]*
3. The remote SSP sends a REL message to the local SSP (or to the intermediate switch). The REL message contains an RO parameter with a Return Error component and an “ipTimeout.” Error Code. *[150]*
4. The intermediate switch receives the REL message, forwards it to the local SSP, and sends an RLC to the remote SSP (or to another intermediate switch). *[102],[103]*
5. The local SSP receives the REL message and sends a Resource_Clear message to the SCP or adjunct. The Resource_Clear message includes the ClearCause parameter containing a value of “ipTimeout.” *[151]*
6. The local SSP does not clear the call to the user. *[151]*

16.5 Exception and error scenarios for remote IP configuration

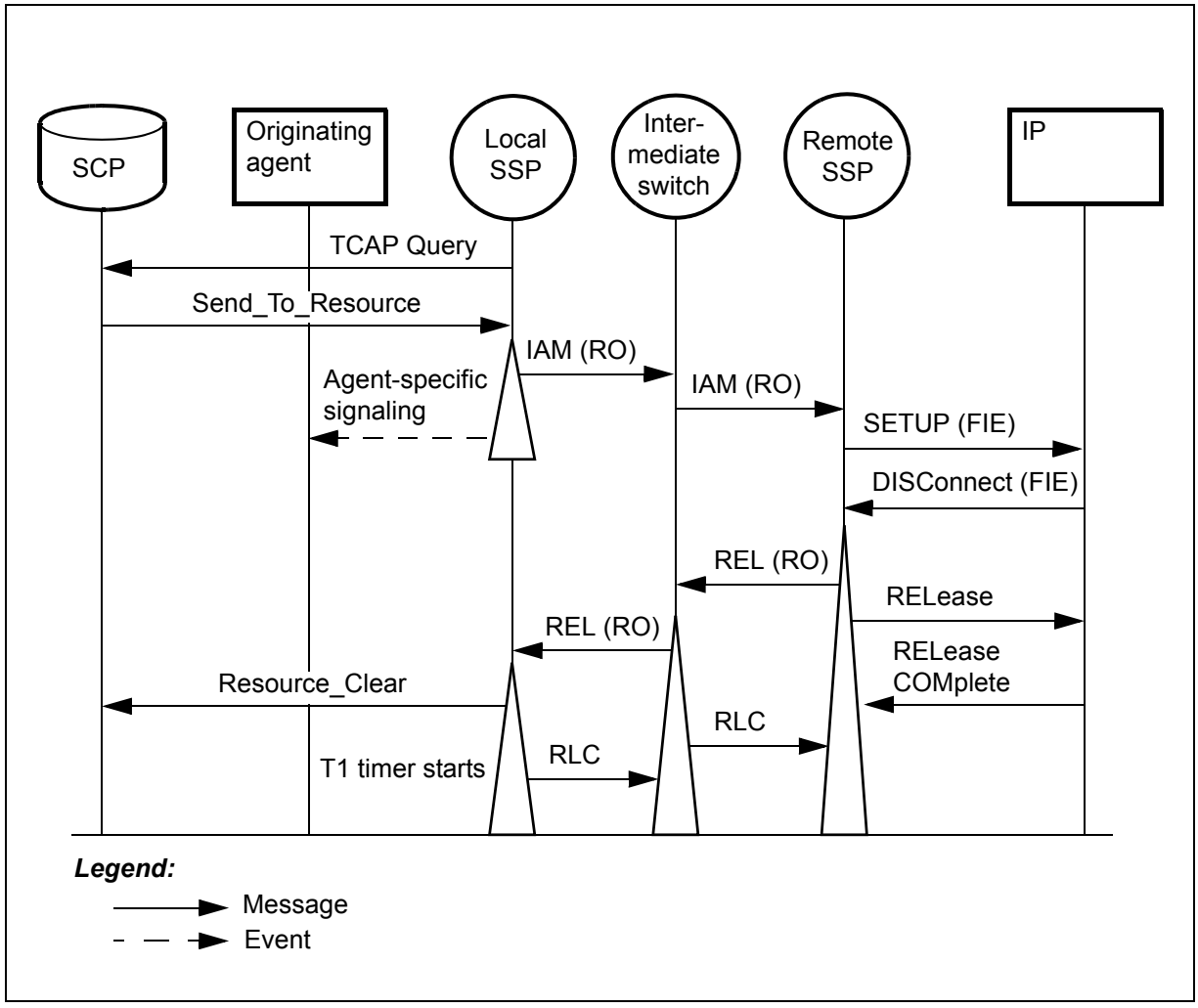
This section documents the SSP behavior for the cases of exception scenarios, such as the following:

- remote IP cannot execute a requested operation
- remote IP sends a reject component to a remote SSP
- remote SSP cannot execute a requested operation
- remote SSP rejects an invoke component in an RO parameter
- remote SSP cannot find a channel to a remote IP
- remote SSP does not respond to a SETUP message
- an intermediate nonDMS switch retriggers

16.5.1 Remote IP cannot execute a requested operation

In the following scenario the remote IP cannot execute the requested operation requested by a SETUP (or FACILITY) message. The remote IP sends the remote SSP a Return Error component, contained in the FIE of a DISConnect (or FACILITY) message. See Figure 99 on page 592.

Figure 99 Remote IP cannot execute the requested operation



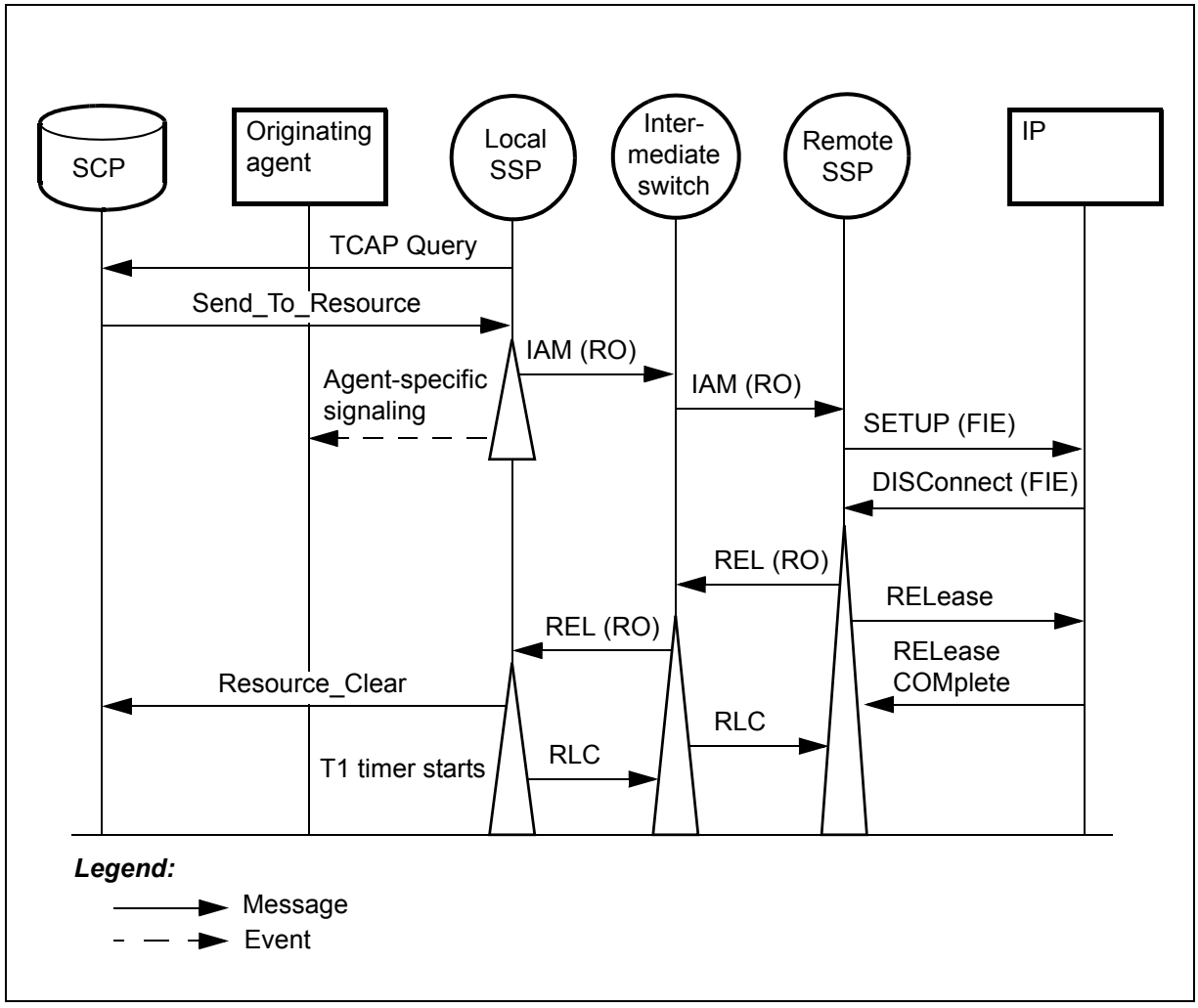
1. The remote IP receives a SETUP message from the remote SSP. The remote IP determines that it cannot execute the requested operation, and sends a DISConnect message with an FIE containing a Return Error component to the remote SSP. *[116]*
2. The remote SSP cancels timer TSTRC (if running), and clears the STR connection. *[116]*
3. The remote SSP sends a REL message, to release the connection to the local SSP. The REL message contains a RO parameter. The RO parameter contains a Return Error component that contains the information from the FIE's Return Error component. *[116]*
4. The intermediate switch receives the REL message and forwards it to the local SSP. [102]. It also sends an RLC to the remote SSP (or to another intermediate switch). *[103]*

5. The local SSP receives the REL message and returns an RLC message for the circuit. *[117]*
6. The local SSP sends a Resource_Clear message to the SCP.The ClearCause value is determined using Table 4.3 in GR-1129, Issue 2. *[117]*
7. If the received Return Error component contains an error parameter, it is included in the ClearCauseData parameter in the ResourceClear message. *[117]*
8. The local SSP does NOT clear the call to the user. *[117]*
9. The remote SSP receives the RLC message. *[100-4]*.

16.5.2 Remote IP sends a reject component to a remote SSP

In the following scenario, the remote IP sends a Reject component to the remote SSP (contained in the FIE of an ISDN Access FACILITY, or DISConnect message) for reasons such as protocol violations, unrecognized components, or unrecognized parameters. The Reject component contains a parameter that indicates the reason for rejection. See Figure 100 on page 594.

Figure 100 Remote IP sends a Reject component to remote SSP



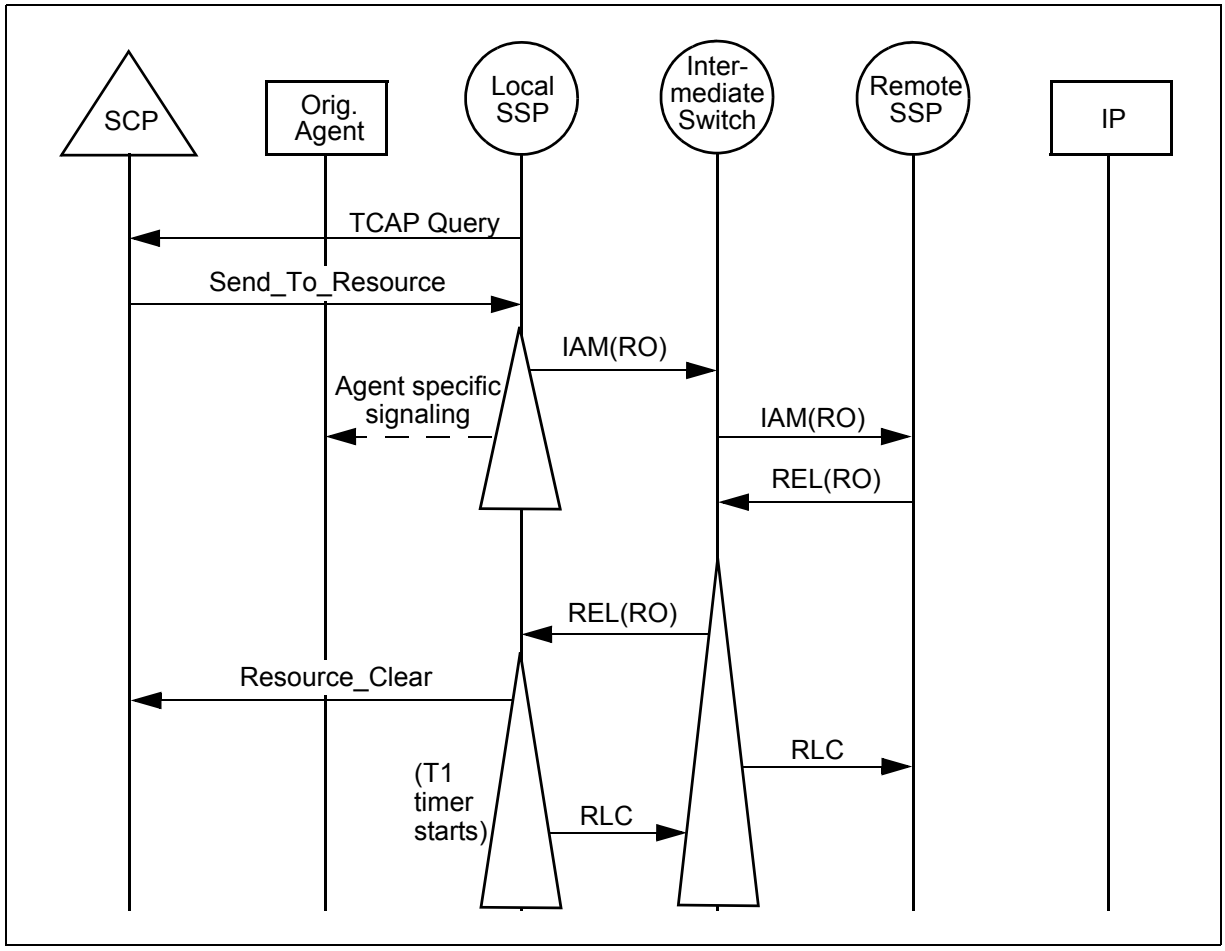
1. The remote IP receives a SETUP message from the remote SSP. The remote IP determines that it cannot execute the requested operation, and sends a DISConnect message with an FIE containing a Reject component to the remote SSP. *[119]*
2. Upon the receipt of the DISConnect message the remote SSP
   - cancels timer TSTRC (if running), *[119]*
   - clears the STR connection, *[119]*
   - initiates the release of the connection to the local SSP by launching a REL message. The REL message contains an RO parameter. The RO parameter contains a Reject component that contains the information from the FIE's Reject component. *[119]*
3. The intermediate switch receives the REL message and forwards it to the local SSP. *[102]*

4. The intermediate switch sends an RLC to the remote SSP (or to another intermediate switch). *[103]*
5. The local SSP receives the REL message and returns an RLC message. *[120]*
6. The local SSP sends a Resource_Clear message to the SCP or adjunct with ClearCause set to “protocolError”.
7. The local SSP does NOT clear the call to the user. *[120]*
8. The remote SSP receives the RLC message. *[100-4]*

16.5.3 Remote SSP cannot execute the requested operation

In the following scenario the remote SSP receives an IAM (or FAC) message from the local SSP (or intermediate switch). The remote SSP cannot execute the requested operation due to an application-type error. See Figure 101.

Figure 101 Remote SSP cannot execute the requested operation



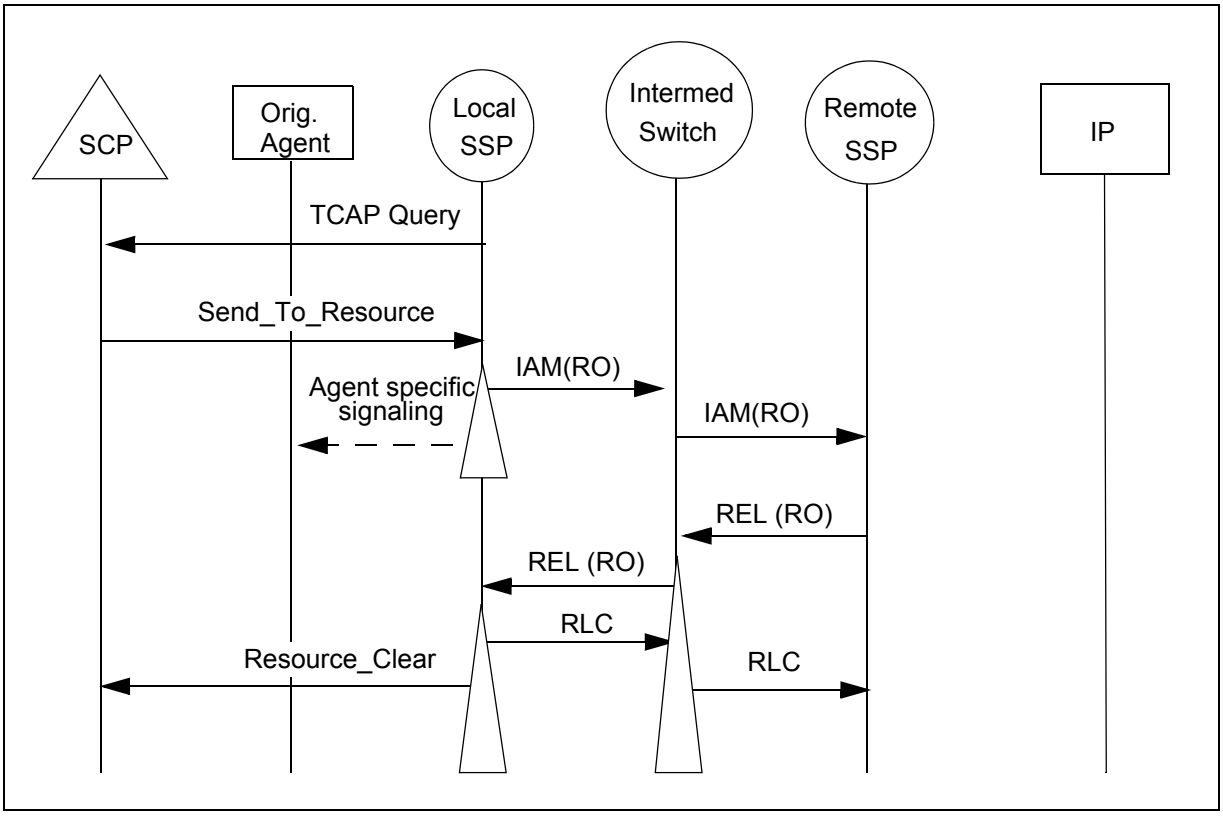
1. The remote SSP receives an IAM message from the local SSP. The remote SSP determines that it cannot execute the requested operation due to an application-type error. *[121]*
2. In response to the Invoke component contained in the RO parameter of the IAM message, the remote SSP sends a REL message to the local SSP to release the connection. The REL message contains an RO parameter. The RO parameter contains a Return Error component containing a specific error cause that indicates the reason for failure. *[121]*
3. The intermediate switch receives the REL message and forwards it to the local SSP. *[102]*
4. The intermediate switch sends an RLC to the remote SSP (or to another intermediate switch). *[103]*
5. The local SSP receives the REL message with the RO parameter and returns an RLC message. *[117]*

6. The local SSP sends a Resource_Clear message to the SCP or adjunct. The ClearCause value is determined using Table 4.3 in GR-1129, Issue 2.*[117]*
7. If the received Return Error component contains an error parameter, it is included in the ClearCauseData parameter in the ResourceClear message. *[117]*
8. The local SSP does NOT clear the call to the user. *[117]*
9. The remote SSP receives the RLC. The remote SSP cancels the appropriate release timers, and idles the incoming circuit. *[100-4]*.

16.5.4 Remote SSP cannot process the RO parameter in an IAM message

In the following scenario, the remote SSP cannot process the RO parameter. See Figure 102.

Figure 102 Remote SSP cannot process the RO parameter in an IAM message



16.5.4.1 Detailed description

1. The remote SSP receives an IAM message, which contains an RO parameter with an Invoke component and a recognized Operation Code. The RO parameter can not be processed due to an application type error, the remote SSP initiates the release of the connection to the local SSP by

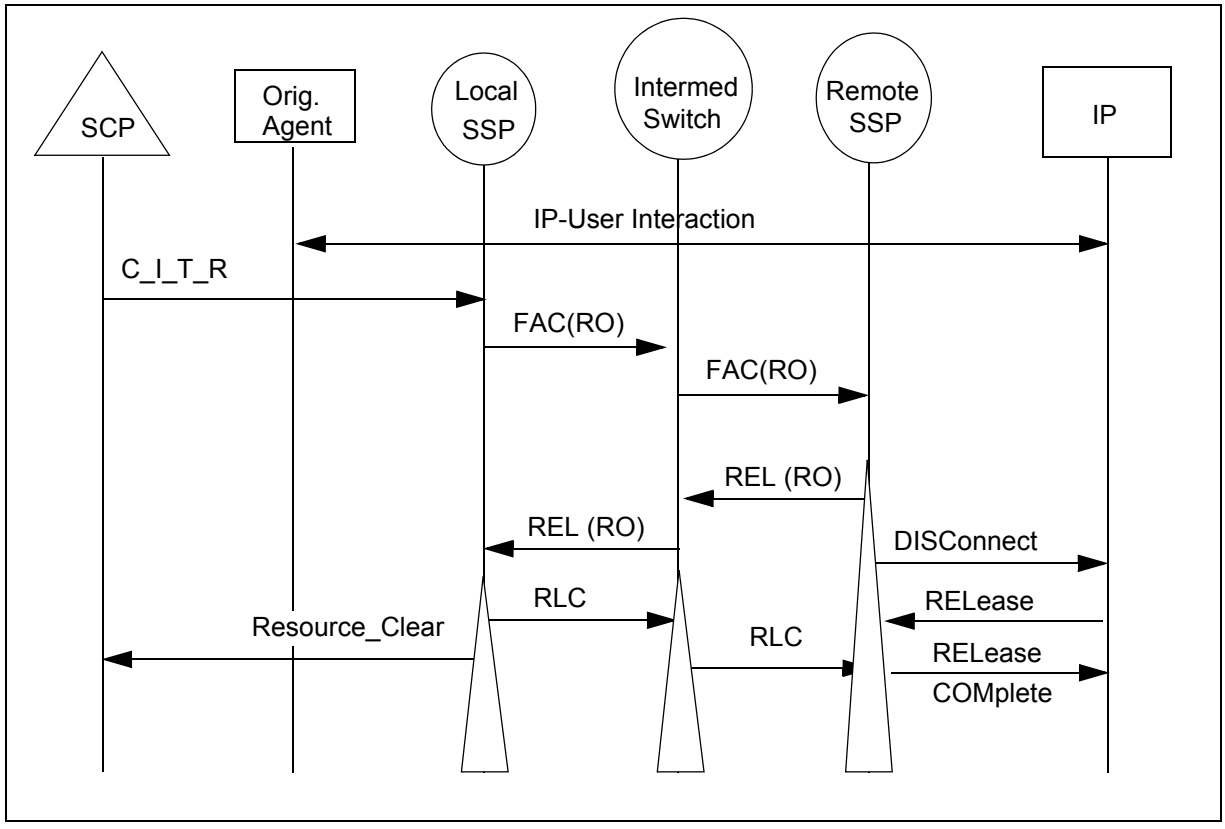
sending a REL message with an RO parameter containing a Return Error component which has an error cause that indicates the reason for failure. *[121]*

2. When the local SSP receives a REL message that contains an RO parameter with a Return Error component, it releases the outgoing ISUP trunk by sending a RLC message *[117]*.
3. The local SSP also sends a Resource_Clear message with a ClearCause parameter to the SCP. The ClearCause value is determined using Table 4.3 in GR-1129, Issue 2. If the received Return Error component contains an error parameter, which may be the case if the remote SSP is not a DMS, it is included in the ClearCauseData parameter in the ResourceClear message *[117]*
4. The Local SSP does not clear the call to the originating user *[117]*

16.5.5 Remote SSP cannot process the RO parameter in a FAC message

In the following scenario, the remote SSP cannot process the RO parameter. See Figure 103.

Figure 103 Remote SSP cannot process the RO parameter in a FAC message



1. The remote SSP receives a FAC message, which contains an RO parameter with an Invoke component and a recognized Operation Code.

The RO parameter cannot be processed due to an application type error, the remote SSP initiates the release of the connection to the local SSP by sending a REL message with RO parameter containing a Return Error component which has an error cause that indicates the reason for failure. *[121]*

2. The remote SSP also releases the connection to the IP, by sending a DISConnect message to the IP.

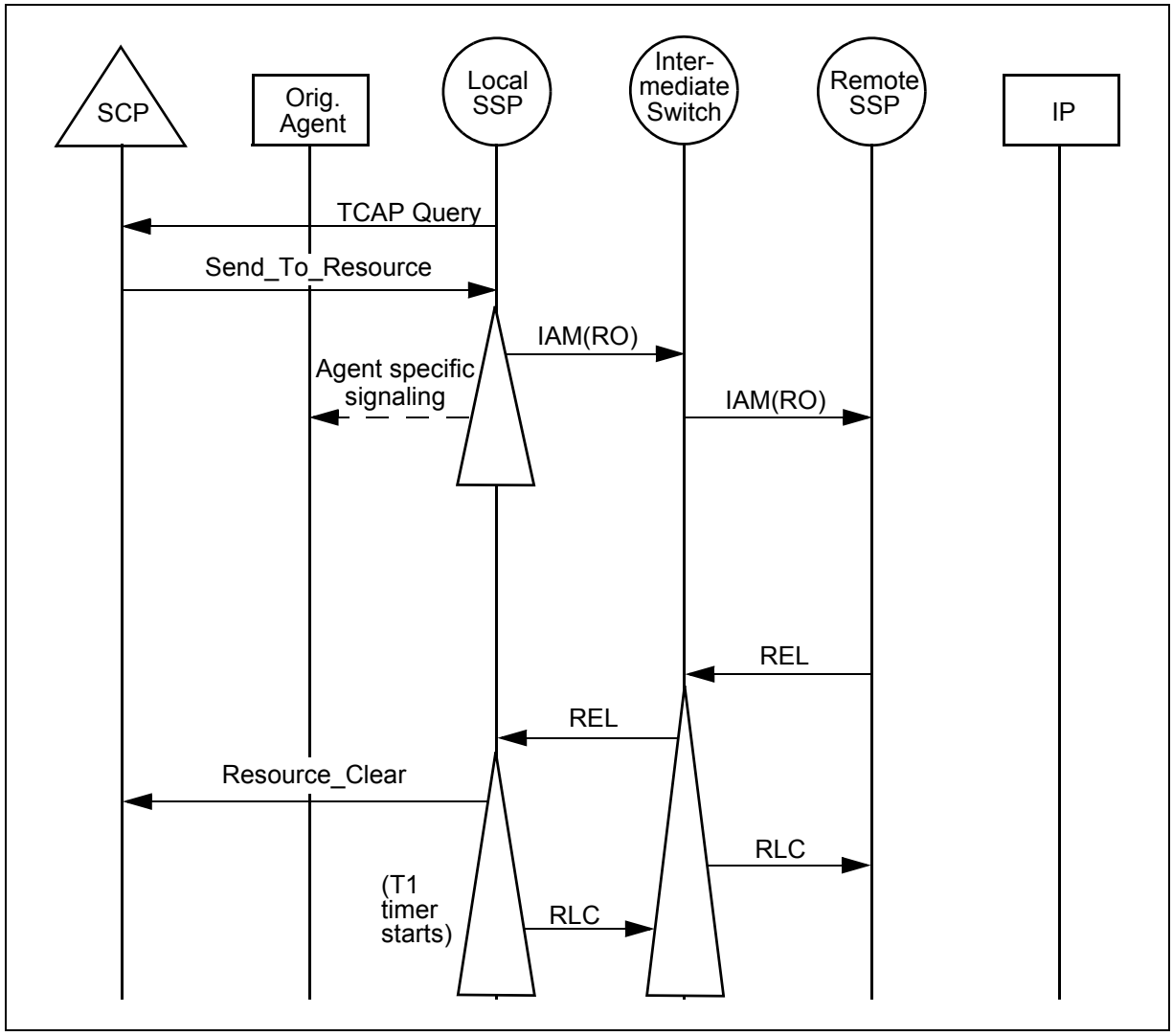
   Note: This is not specified in GR-1129, Issue 2, but is the standard way to take the STR connection down.

3. When the local SSP receives a REL message that contains an RO parameter with a Return Error component, it releases the outgoing ISUP trunk by sending a RLC message *[117]*.
4. The local SSP also sends a Resource_Clear message with a ClearCause parameter to the SCP. The ClearCause value is determined using Table 4.3 in GR-1129, Issue 2. If the received Return Error component contains an error parameter, it is included in the ClearCauseData parameter in the ResourceClear message *[117]*
5. The Local SSP does not clear the call to the originating user *[117]*

16.5.6 Remote SSP cannot find a channel to a remote IP

In the following scenario the remote SSP tries to make a connection to the remote IP, but determines that all channels to the remote IP are busy. See Figure 104 on page 600.

Figure 104 The remote SSP cannot find a channel to remote IP



1. The remote SSP receives an IAM message and determines that an idle B-channel to the IP is not available.
2. The remote SSP sends a REL message to the local SSP (or to the intermediate switch) with the Cause Value in the Cause Indicators set to "No Route To Destination". *[141]*

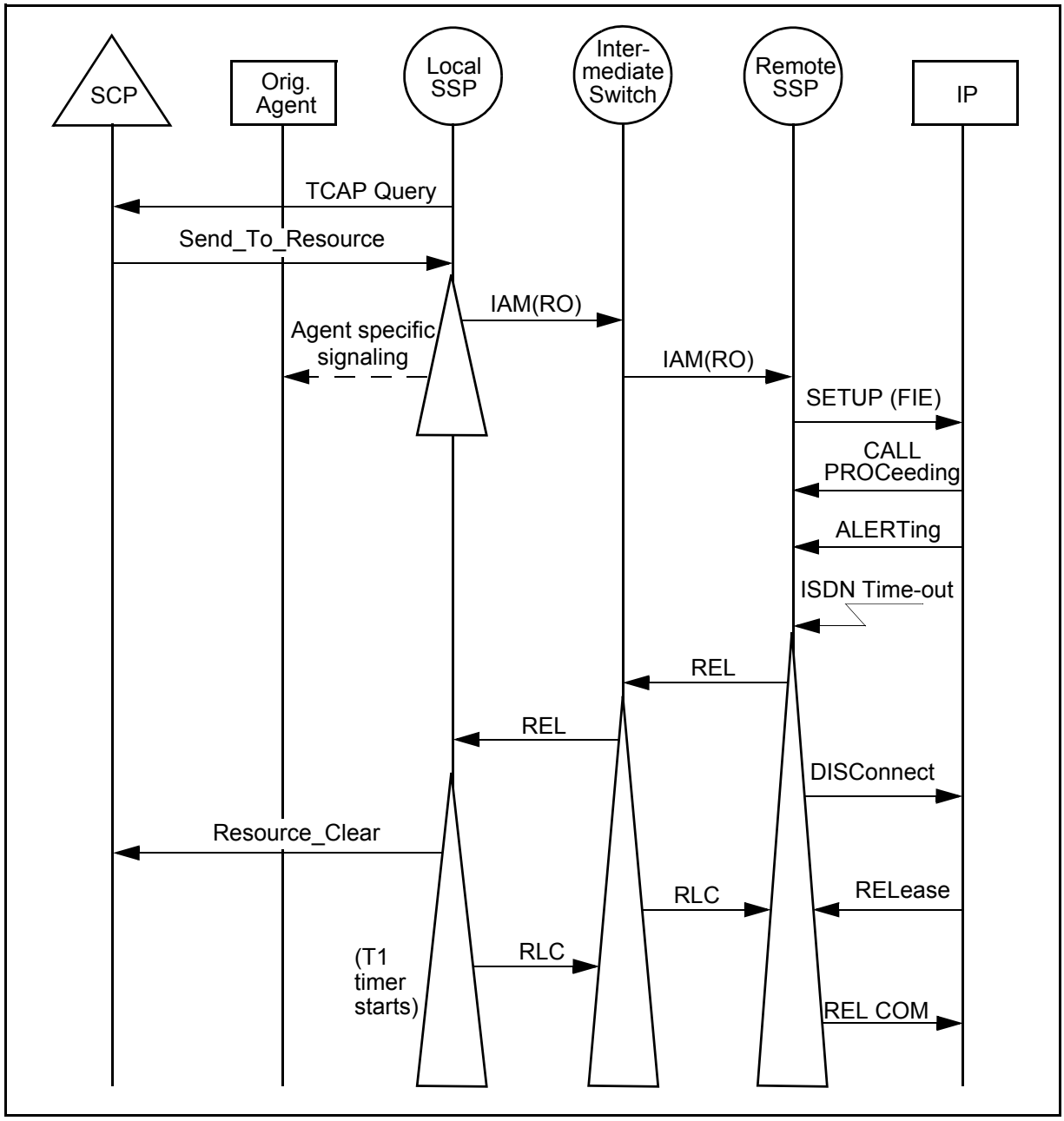
   Compliance note: This is partially compliant to *[141],* which requires the REL message to contain the RO parameter with a Return Error component containing a "channelsBusy" Error Code. *[141]*
3. The intermediate switch receives the REL message and forwards it to the local SSP and sends an RLC to the remote SSP (or to another intermediate switch). *[102], [103]*

4. The local SSP receives the REL message and returns an RLC message. *[120]*
5. The local SSP sends a Resource_Clear message to the SCP or adjunct with ClearCause set to “channelsBusy.” *[142]*
6. The local SSP does NOT clear the call to the user. *[120]*
7. The remote SSP receives the RLC. The remote SSP cancels the appropriate release timers, and idles the incoming circuit. *[100-4]*

16.5.7 Remote IP does not respond to the SETUP message

In the following scenario the remote SSP sends a SETUP message to the remote IP, but does not receive any answer from the IP. See Figure 105.

Figure 105 Remote IP does not respond to the SETUP message



1. The remote SSP receives an IAM message.
2. Then, one of the following occurs:
   - The SSP sends a SETUP message to the IP. However the SSP does not receive any answer from the IP.

     Note: In this case the SSP sends a second SETUP message to the IP. This is not shown in Figure 105 on page 602 because it is part

of the standard PRI protocol.

- Either a CALL PROCeeding or ALERTing or both are received (in response to a SETUP message), but a CONNect message is not received (that is, there is a partial response from the IP).

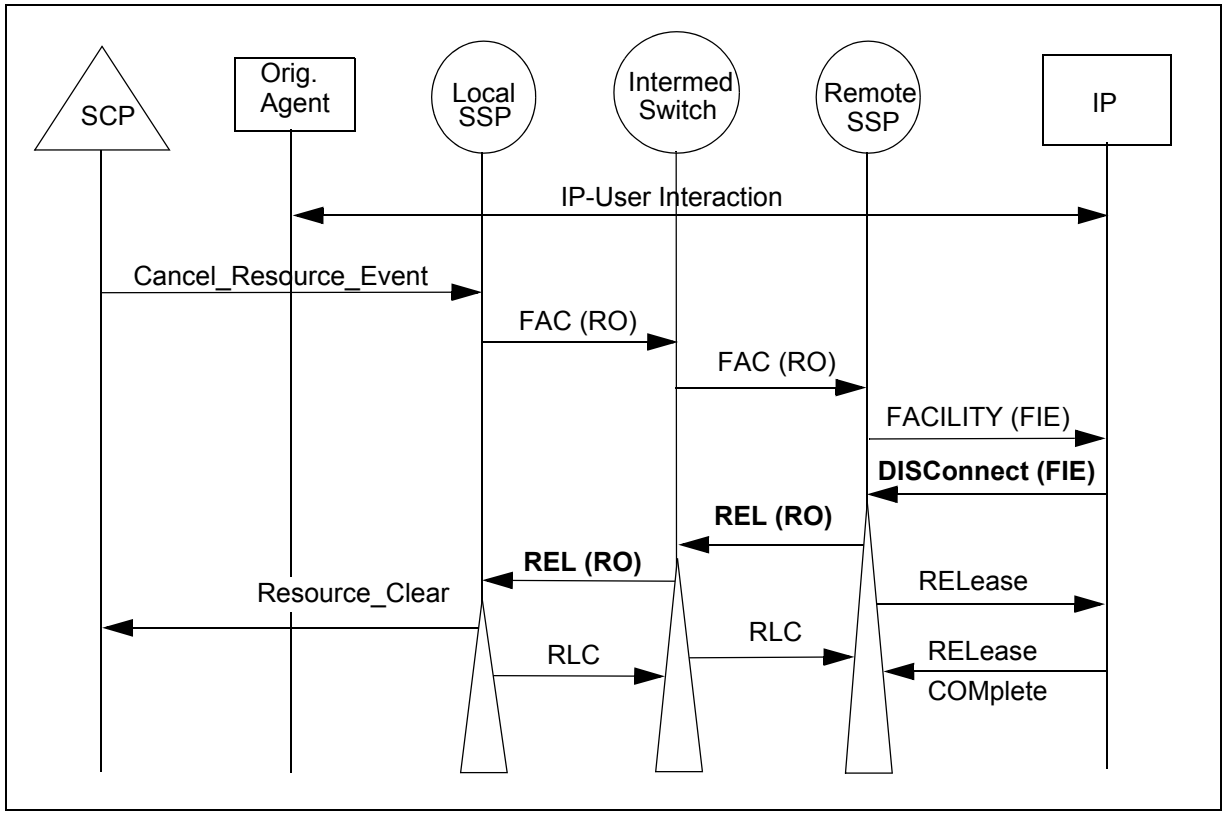
In either case the scenario proceeds as follows.

3. The remote SSP sends a REL message to the local SSP (or the intermediate switch). The REL message contains an RO parameter with a Return Error component and an "isdnTimeout" Error Code. *[145]*
4. The remote SSP clears the STR connection.
5. The intermediate switch receives the REL message and forwards it to the local SSP and sends an RLC to the remote SSP (or to another intermediate switch). *[102], [103]*
6. The local SSP receives the REL message and sends a Resource_Clear message to the SCP or adjunct. The Resource_Clear message includes the ClearCause parameter containing a value of "isdnTimeout." *[144]*
7. The local SSP does not clear the call to the user. *[144]*

16.5.8 Remote SSP cannot process the "CancelIPResource" operation

The message flow for the processing of a CancelIPResource request is repeated below. The first part of the scenario is as documented in Section 16.4.2 "Cancel Resource event in a remote IP configuration" on page 585.

Figure 106 Remote SSP Can Not Process the "CancelIPResource" Operation



If the IP can not process the "CancelIPResource" operation, it may respond with an ISDN DISConnect message containing an FIE with a Return Error or a Reject component.

16.5.8.1 Remote SSP Receives an ISDN DISC message with a Return Error component

1. The remote SSP cancels the TSTRC timer, and clears the STR connection *[116]*
2. The remote SSP sends a REL message, to release the connection to the local SSP. The REL message contains an RO parameter. The RO parameter contains a Return Error component that contains the information from the FIE's Return Error component. *[116]*
3. The intermediate switch receives the REL message and tandems it to the local SSP. *[102]*. It also sends an RLC towards the remote SSP. *[103]*
4. The local SSP receives the REL message and returns an RLC message to release the call to the remote SSP. *[117]*
5. The local SSP sends a Resource_Clear message to the SCP. It uses the Error Type of the The Return Error component in the RO parameter to determine the ClearCause value. If the Return Error component contains

an error parameter, it is sent to the SCP in the ClearCauseData parameter of the Resource_Clear message. *[117]*

6. The Local SSP does not clear the call to the originating user *[117]*

16.5.8.2 Remote SSP Receives an ISDN DISC message with a Reject component

1. The remote SSP cancels the TSTRC timer, and clears the STR connection *[119]*
2. The remote SSP sends a REL message, to release the connection to the local SSP. The REL message contains an RO parameter. The RO parameter contains a Reject component. *[119]*
3. The intermediate switch receives the REL message and tandems it to the local SSP. *[102]*. It also sends an RLC towards the remote SSP. *[103]*
4. The local SSP receives the REL message and returns an RLC message to The local SSP sends a Resource_Clear message to the SCP, with ClearCause = “ProtocolError”. *[120]*
5. The Local SSP does not clear the call to the originating user *[120]*

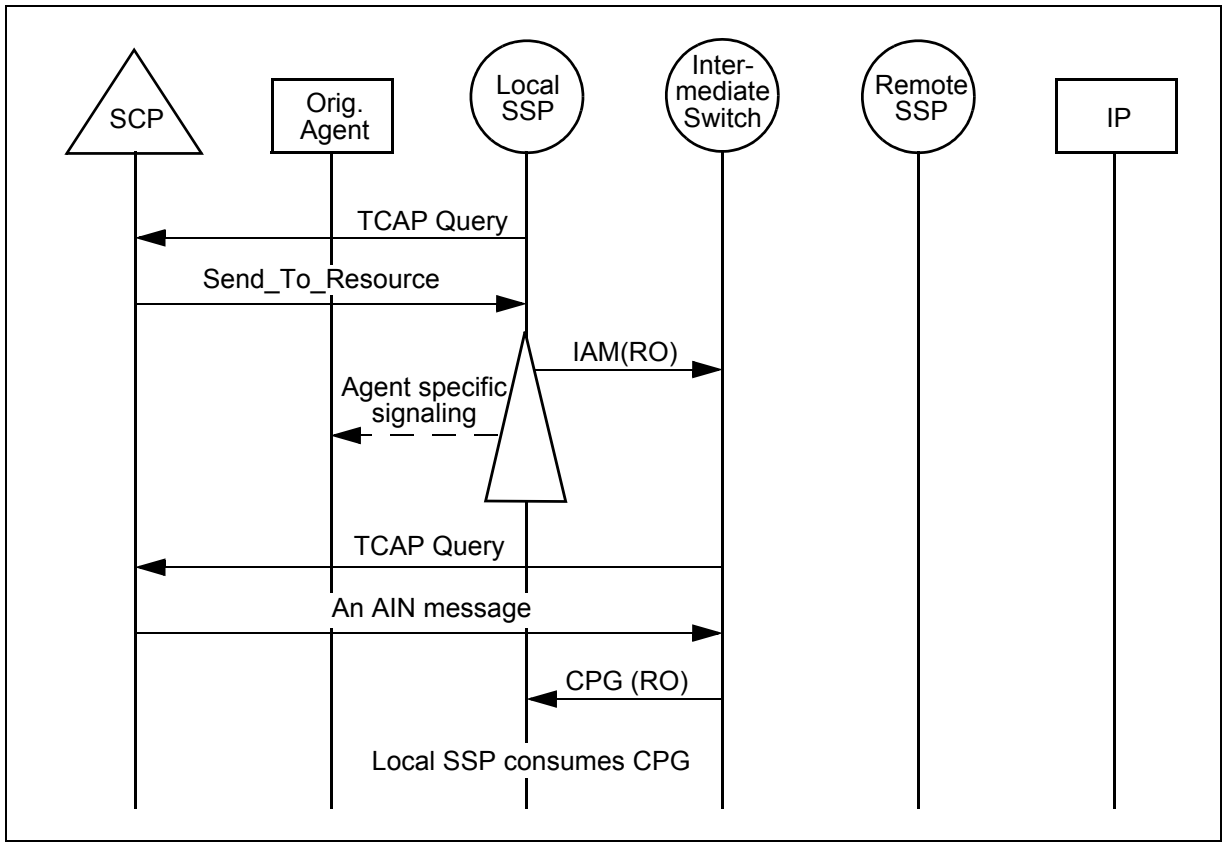
16.5.9 An intermediate nonDMS switch retriggers

In the following scenario, the local SSP tries to establish an STR connection to the remote IP. However, an intermediate SSP triggers on the incoming or outgoing ISUP call.

Note: If the intermediate switch is a DMS switch, it does not retrigger.

The intermediate SSP communicates with the SCP or adjunct, and decides to cancel the STR connection or to disconnect the call. See Figure 107 on page 606.

Figure 107 Intermediate switch retriggers



- The intermediate SSP receives an IAM message from the local SSP. The intermediate SSP triggers and sends a query to the SCP or adjunct.
- The SCP sends a response to cancel the STR or a Disconnect response to the intermediate SSP.
- The intermediate SSP forms and sends an ISUP CPG message, with an RO parameter containing a Return Error component, to the local SSP.
- The local SSP receives the CPG message and ignores it. Consequently, A Resource_Clear message is not sent to the SCP.
- **Compliance note:** Ignoring the CPG message is noncompliant behavior to GR-1129-CORE, Issue 2, *[139]* and *[140]*. Resolution to ILR 2225 eliminates the responses to cancel the STR and hence the possibility of receiving a CPG message with an RO parameter. When this ILR is incorporated into GR-1129-CORE, the compliance note will be obsolete.

16.6 Routing to a remote IP

Equal Access is provided for Send_To_Resource interaction between an SSP and an IP, including support for Carrier, Alternate Carrier, and Second Alternate Carrier. When a carrier is not provided for routing to a remote IP across LATAs, connectivity will not be established.

There are two ways to process the Destination Address. The Destination address may be included in the Send_To_Resource message and translated using the triggering agent's attributes, or STR specific Line Attributes may be used to override the originator's attributes.

16.6.1 Processing of Carrier for Send_To_Resource

The CarrierID field in the coversation message of Send_To_Resource is provided by the SCP to route a call to a remote IP over a certain carrier. The parameters in a message that specify the route for a call are as follows:

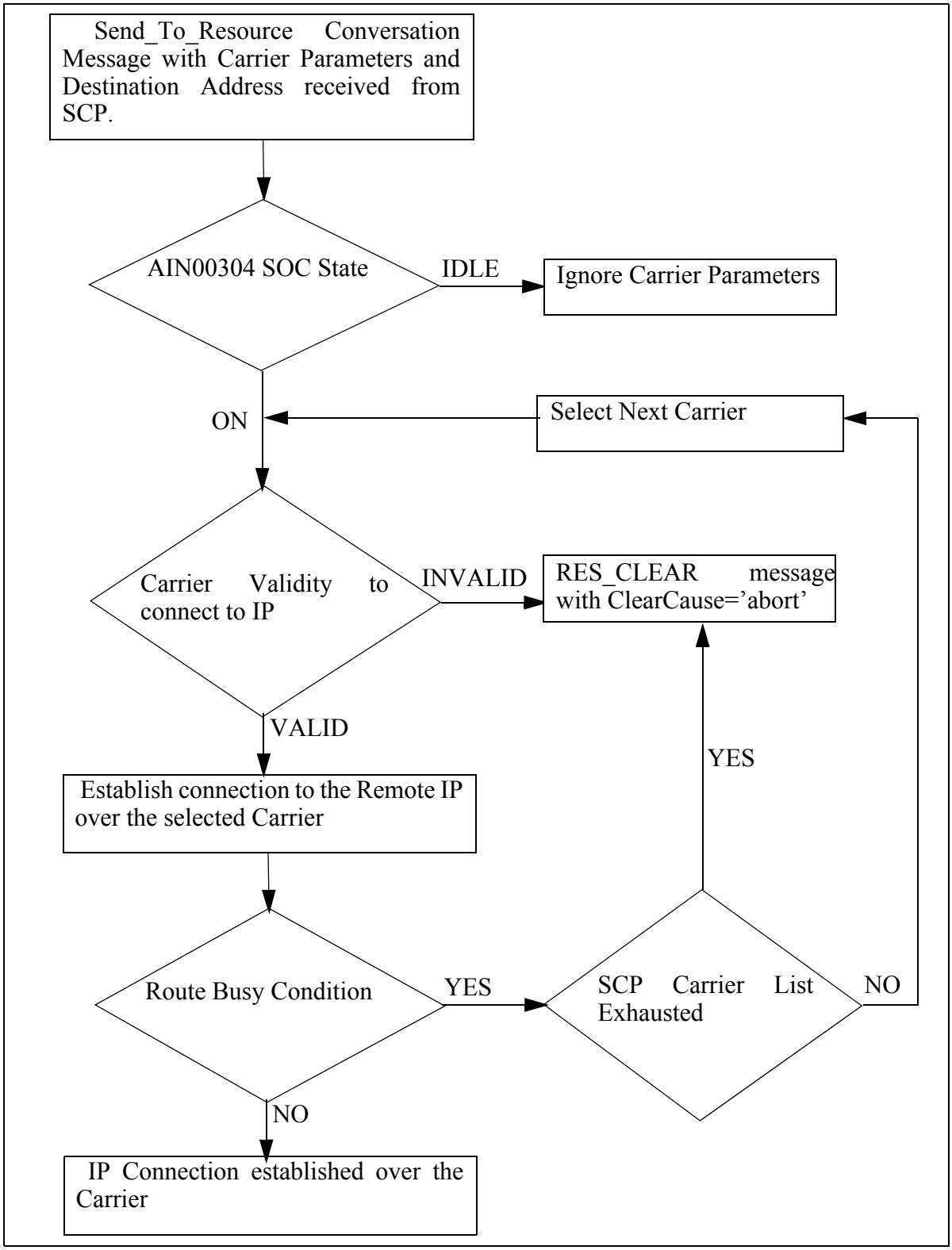
- Carrier(Optional)
- AlternateCarrier (Optional)
- SecondAlternateCarrier (Optional)

The above list also determines the order of preference of the route selected to route a call. When the call meets with a busy route when routing over first SCP provided carrier (Carrier parameter), the AlternateCarrier, when provided by the SCP, is used for routing. If all the routes are exhausted, a resource clear message is sent back to SCP with ClearCause='ChannelBusy'.

When the carrier selected is not capable of handling the calltype, which is determined by the information from Table OCCINFO, a Resource Clear message is sent to the SCP with Clear Cause = Abort. Call type is determined by the translators after translating the Destination Address during response translation. This is done by the translators by using the datafill in Table LATAXLA. The NatureOfCarrier field and the CarrierSelection field of the Carrier parameter are ignored during processing.

In keeping with the existing Send_To_Resource functionality, no triggers will be encountered even when a carrier is specified in the Send_To_Resource message.

Figure 108 Carrier routing to a remote IP



16.6.2 Destination Adress translation

When the Destination Address is included in the STR response, screening is based on the routing characteristics of the triggering agent. Any toll restriction features and other screening is based on the routing characteristics of the triggering agent, which prevents translations from terminating on Destination address (IP).

The Destination Address may be sent in the Send_To_Resource coversation message from SCP and translated using Line Attributes provided in Table STRATTRS against that Destination Address. The table is traversed to find any entry corresponding to the particular Destination Address. When found, the triggering agent's attributes are overridden with the information available in the table. When no valid entry is found against the specified Destination Address, the triggering agent's attributes are used for translating the Destination Address.

16.6.2.1 Table STRATTRS

Table STRATTRS stores the Line Attributes associated the translation of Destination Address. The following attributes against each particular Destination Address are included:

- "From" Destination Address
- "To" Destination Address
- Line Attribute Index
- XLAPLAN
- RATEAREA

Note: The "From" Destination Address and the "To" Destination Address can be the same.

The index to Table STRATTRS is the Destination Address sent by the Send_To_Resource message. These attributes are used to replace the triggering agent's attributes for Destination Address translation, in case a matching tuple for the given Destination Address is found in Table STRATTRS.

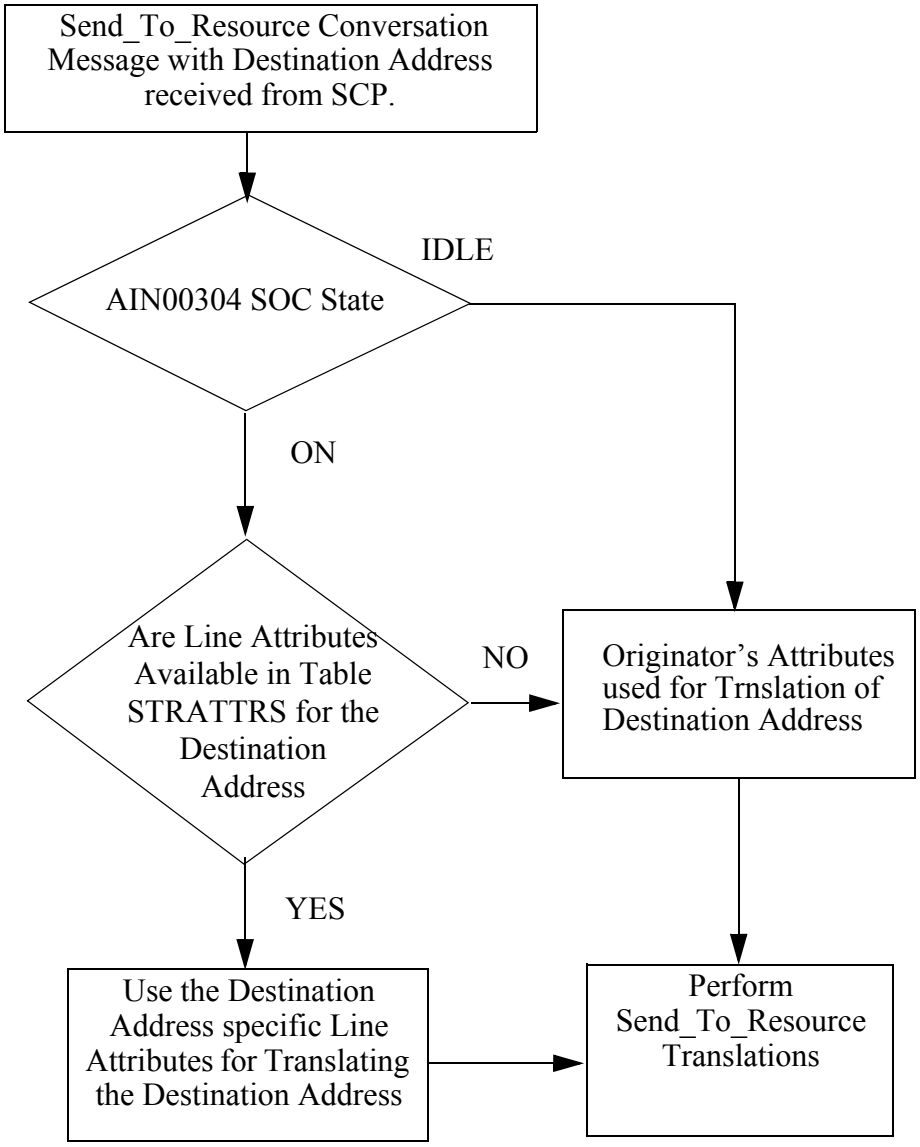
Table 158 Table STRATTRS example

DESTADDR	LINEATTR	XLAPLAN	RATEAREA
6136217777 6136217778	27	613_P621_27	613_LATA1_27

This table needs to be provisioned by the Service Provider for each Destination Address whose translation from the triggering agent needs to overcome toll restrictions imposed by triggering agent's attributes. In particular, a subscriber can have a class of service or pre-translator which restricts toll calls (e.g 900,

976 or all toll calls) in accordance to line attributes defined in SSP. This feature enables TELCO to datafill a different line attribute to be used while translating to the Destination Address provided in STR message when the subscriber or any other agent with toll restrictions is the triggering agent. When attributes against a Destination Address are not datafilled in Table STRATTRS, translations of Destination Address will be exercised using triggering agent's line attributes.

Figure 109 Send_To_Resource Destination Address translation



17 Connect_To_Resource

The Connect_To_Resource (CTR) message is an SCP/Adjunct message sent to an SSP in response to a midcall trigger or event to connect a user (in talking state) to a resource. It can be received either in a response or a conversation package. The Connect_To_Resource message has similar functionality to the Send_To_Resource message, the difference being when it may be encountered in the call.

Connect_To_Resource message processing is supported for only Timeout and O_Disconnect, O_Disconnect_Called events. For O_Disconnect Event, CTR is supported only in Response Package.

AIN Service Enablers implement the Connect_To_Resource and CTR_Clear message processing according to Chapter 21 in GR-1298, Issue 6 and GR-1299, Issue 6.

When a Connect_To_Resource message is received as a response to an event detected in Origination Basic Call Model (OBCM) then for a call in CC2 (CC2 is a Stable 2-Party call), CTR is valid only at the O_Mid_Call DP or after PIC 9 (O_Active) has reached.

When a Connect_To_Resource message is received as a response to an event armed in Terminating Basic Call Model (TBCM) then for a call in CC2, CTR is valid only at the T_Mid_Call DP or after PIC 16 (T_Active) has been reached.

The functionality provided by the Connect_To_Resource message is shown by this example:

- A Subscriber dials a calling card service provider SDS trigger number and provides the card number and destination party number to the SCP using STR interactions.
- The SCP calculates the time remaining (Tout) on the card and sends the AR response with the called party and a Timeout CPH event with the Timeout timer set to Tout-1 minute.

- The Timeout timer is started when the speech path is established, and the Timeout query is sent when the timer expires.
- On getting a Connect_To_Resource message as response for the Timeout query, the customer is informed of the time remaining on the card (by playing the announcement) and given a choice to recharge the card in the remaining minute. The collected digits are sent to the SCP in a CTR_Clear message.
- The SCP sends a Continue message in response to the CTR_Clear message. This message is processed by the SSP and the call is allowed to continue.
- When the call is completed before the Timeout timer expires, the calling card details are updated at the SCP when the Close message is obtained for Timeout.

This capability can be used to build a number of personalized services where announcement are to be played and digits are to be collected from a user.

17.1 Connect_To_Resource message processing

The SSP processes the Connect_To_Resource message received from the SCP without the destination address parameter as a request to connect a specified user to the resource (Internal/External).

Figure 110 Connect_To_Resource message processing

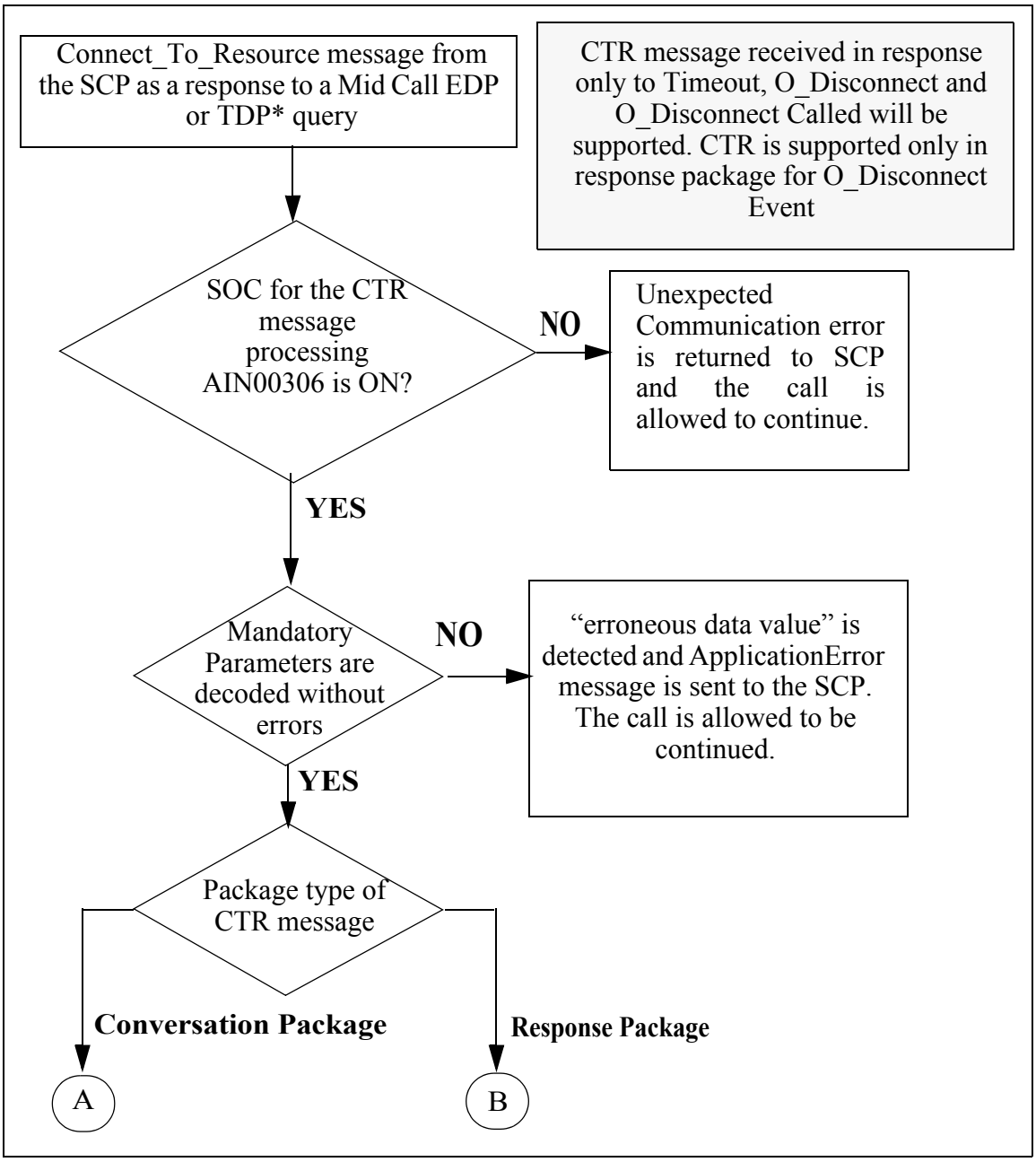
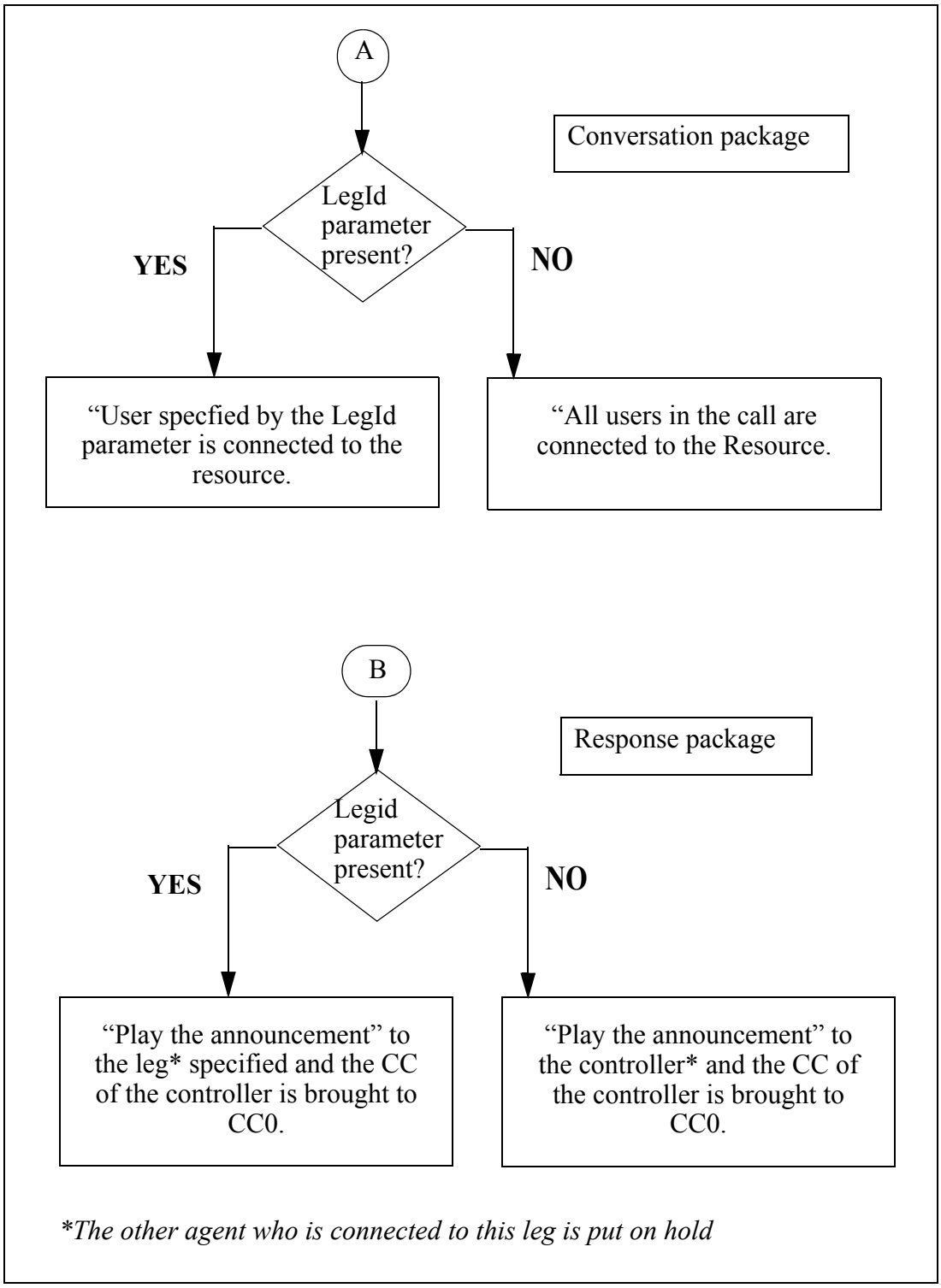


Figure 111 CTR message processing (continued)



The Connect_To_Resource message can be received in either a response package or Conversation package.

When the Connect_To_Resource message is received in a response package, then the announcement is played to the agent specified by the LegId. After the interaction is complete with the resource a disconnect treatment is given to the agent. After CTR processing the resulting CC is CC0.

When the Connect_To_Resource message is received in a conversation package, then the LegId specified in the CTR message is connected to the resource. The announcement is played and digits are collected from the agent specified by the LegId. The collected digits are sent to the SCP in the CTR_Clear message after the interaction is completed.

When LegId is not specified in the CTR message all the agents involved in the call are connected to the resource.

While playing announcements and collecting digits with a user, the other parties involved in the call will not be able to talk with that user. For example in a two party call (CC2), if the calling party is connected to a CTR announcement, the called party is put on hold.

17.1.1 Connect_To_Resource message examples

17.1.1.1 CTR message received in a Response Package

This example shows the functional behavior when the CTR message is received in a Response Package.

1. A calls a SDS number
2. An SDS trigger is encountered and a query is sent to the SCP.
3. An Analyze_Route message is returned by the SCP with called party id as B. The SCP arms the TIMEOUT event with timer value of 1 min.
4. A and B are in speech path.
5. A Timer starts when speech path is established between A and B.
6. The Timer expires after 1 min.
7. When the timer expires, Timeout EDP-R is sent to the SCP.
8. The SCP responds with a CTR message (response package), LegId parameter as 0.
9. The voice path between A and B is put on hold. A hears the announcement while B hears silence.
10. An Announcement is played to A.
11. After the interaction with the resource is complete, the call is brought down. The final treatments to the agents after the response processing is

similar to the treatments when a Disconnect message is received for the Timeout query. However, AIND treatment is not played to controller.

17.1.1.2 CTR message received in a Conversation Package

This example shows the functional behavior when the CTR message is received in a Conversation Package.

1. A calls a SDS number
2. An SDS trigger is encountered and a query is sent to the SCP.
3. An Analyze_Route message is returned by the SCP with called party id as B. The SCP arms the TIMEOUT event with timer value of 1 min.
4. A and B are in speech path.
5. A Timer starts when speech path is established between A and B.
6. The Timer expires after 1 min.
7. When the timer expires, Timeout EDP-R is sent to the SCP.
8. The SCP responds with a CTR message (conversation package), LegId parameter as 0.
9. The voice path between A and B is put on hold. A hears the announcement while B hears silence.
10. An Announcement is played to A.
11. Digits are collected from A.
12. A CTR_Clear message containing the collected digits is sent to the SCP.
13. The connection and speech path between A and B is restored.
14. The SCP may responds by sending a Continue message.
15. The Continue message is processed by the SCP and A and B continue to talk.

17.2 Connect_To_Resource message parameters

Table 159 summarizes the parameters in the Connect_To_Resource message.

Table 159 Connect_To_Resource message

Parameter	CTR in conversation package	CTR in response package
AMAAlternateBillingNumber	Optional	Optional
AMABillingFeature	Optional	Optional
Note: Parameters in shaded areas are not supported in this release.		

Table 159 Connect_To_Resource message (Continued)

Parameter	CTR in conversation package	CTR in response package
AMABusinessCustomerID	Optional	Optional
AMAMeasure	Optional	Optional
AMASequenceNumber	Optional	Optional
AMAServiceProviderID	Optional	Optional
AMAslpID	Mandatory	Mandatory
Amp1		
Amp2		
DestinationAddress	Optional	Not applicable
DisconnectFlag	Not applicable	Mandatory
DPConverter	Optional	Not applicable
ExtensionParameter		
LegId	Optional	Optional
PrimaryBillingIndicator	Optional	Optional
ResourceType	Mandatory	Mandatory
ServiceContext	Optional	Optional
ServiceProviderID	Optional	Optional
StrParameterBlock	Mandatory	Mandatory
TSTRCTimer	Optional	Optional
Note: Parameters in shaded areas are not supported in this release.		

17.2.1 Parameter decoding

17.2.1.1 AMA Measure

On reception of this parameter, the time duration is measured in one of the following 3 ways:

- connectTimeRecordedDestinationSSP (0)
- connectTimeRecordedDestinationSCP (1)
- connectTimeNotRecorded

17.2.1.2 LegID

The announcement is played to the agent which corresponds to the LegId received in the CTR message.

The LegID parameter provides the identifier of a leg in a call segment to which the resource is connected. The value of this parameter ranges between 0-2. LegID is invalid if there is no agent that corresponds to that leg in the CC.

- When the LegId is 0, the controller is connected to the resource.
- When the LegId is 1, the Leg 1 is connected to the resource.
- When the LegId is 2, the Leg 2 is connected to the resource.
- When the LegId is not specified, the controller is connected to the resource.
- When the LegId is not specified, all the agents in the call are connected to the resource.

17.2.1.3 ResourceType

The ResourceType parameter indicates the type of resource to which a user is to be connected.

When the CTR is received in a response package, ResourceType is interpreted to be ‘playAnnouncements.’

Digits are collected from this agent after playing the announcement only if CTR message is received in conversation package.When the CTR is received in a conversation package, ResourceType is interpreted to be ‘playAnnouncementsAndCollectDigits.’

17.2.1.4 StrParameter Block

The StrParameter Block parameter informs the SSP what it needs for the utilization of the resource.

When the CTR is received in a response package, the SCP requests playing an announcement only, thus the StrParameter Block is encoded as ‘AnnouncementBlockParm.’

When the CTR is received in a conversation package, the SCP requests both playing an announcement and collecting digits. In this case the StrParameter Block is encoded as ‘AnnouncementDigitBlockParm.’ The number of digits that can be collected are determined by the parameter MaximumDigits (0-255) in AnnouncementDigitBlock present in the CTR message.

There are three different modes of digit collection depending upon the value of the MaximumDigits parameter:

- Fixed number of digits — When the MaximumDigits value is between 1 and 252:

  The digit collection is considered complete when the user provides the specified number of digits. When the user presses the '#' button during collection, the ClearCause value is set to "Invalid Code"

- Normal number of digits — When the MaximumDigits value is 253:

  The digit collection is complete when the user provides a complete code, and no code conflicts exist (according to the dialing plan in force). When the user presses the '#' button during collection, the ClearCause value is set to "Invalid Code"

- Variable number of digits — When the MaximumDigits value is 254:

  The digit collection is considered complete when an interdigit timeout occurs, or if the user sends an end of dialing indicator, '#'.

An announcement may be defined as user-intrerruptible or non-user-interruptible.

When an announcement is defined to be user-interruptible, the announcement is stopped on receiving the first digit from the user. Then the interdigit timer is started.

When an announcement is defined to be non-user-interruptible, digits that are dialled by the user are ignored while the announcement is being played. The interdigit timer is started after the announcement ends. Digits dialled by the user are then collected.

The announcement ID in the announcement Block must be between 1 and 511.

17.2.1.5 DestinationAddress parameter

This parameter is supported for CTR message in conversation package. The following rules apply to CTR messages with the DestinationAddress parameter:

- The CTR message must be received in a conversation package.
- The destination Address must be in the 10-digit national ISDN number format.
- ResourceType should be "flex parameter block".
- DisconnectFlag must be absent.

17.2.1.6 DpConverter parameter

The DPConverter parameter is applicable for CTR/IP message processing.

The DP Converter for CTR/IP provides dial pulse (DP) to dual-tone multi frequency (DTMF) conversion upon receiving the DPConverter parameter set to TRUE in the Connect_To_Resource message. This feature provides for sending both the dialed DP digits and the equivalent DTMF tones to the terminator / intelligent peripheral (IP) and terminating agent. DP conversion is started on the agent based on the legid received in the CTR message. If no legid is provided in the CTR message, DP conversion is started on all the agents involved in the call segment.

The DPConverter Parameter is ignored if the CTR message does not contain the Destination Address Parameter.

17.2.2 CTR message parameter usage

The following rules apply to CTR messages received in a response package:

- DisconnectFlag must be present.
- AnswerIndicator is or is not present.
- ResourceType must be PlayAnnouncement.
- STRParameterBlock tag must be AnnouncementBlock.
- An uninterruptible announcement must be specified (the AnnouncementBlock must be encoded as an UninterAnnounceBlock).
- The System Announcement ID within the AnnouncementBlock must be 1 to 32767.

The following rules apply to CTR messages received in a conversation package:

- AnswerIndicator is or is not present.
- ResourceType can be “Play Announcement” or “Play Announcement and Collect Digits”.
- DisconnectFlag must be absent.
- When the ResourceType is Play Announcement, the STRParameterBlock tag must be AnnouncementBlock. When the ResourceType is Play Announcement and Collect Digits, the STRParameterBlock tag must be AnnouncementDigitBlock.
- The value of the MaximumDigits in the AnnouncementDigitBlock specifies the digit collection type and the number of digits to collect as specified in GR-1298-CORE, Issue 3, July 1996.
- The System Announcement ID within the AnnouncementBlock (or AnnouncementDigitBlock) must be 1 to 32767.

- When the fixed number of digits to collect is “0”, an uninterruptible announcement must be specified.
- When parameter ExtendedRinging is present, it signifies to the SSP that it should continue alerting the called party, while the caller is connected to an announcement and prompted for digit collection during CTR processing.

Note: When the ResourceType is Play Announcement, this is treated as a nonfatal communication error and the SSP processes CTR message as a play announcement request received in a response package by playing the announcement or tone and disconnecting the call. In this scenario, the presence or absence of the DisconnectFlag is irrelevant. This non fatal error is not reported to the SCP.

For both package types, the STRParameterBlock can specify up to 10 announcements. Only the first announcement is taken into consideration while processing the CTR request and the rest are ignored.

CTR messages not encoded as above are regarded as Fatal Protocol Errors. These errors are reported to the SCP in an appropriate error message, and AIN final treatment (AINF) is applied to the originating party.

17.3 CTR_Clear message

A CTR_Clear message is sent to the SCP from the SSP in response to a CTR message received in a Conversation Package. This message is sent to the SCP when an interaction is complete or interrupted (for example, user abandon). This CTR interaction could be playing announcements and/or collecting all the required information.

Table 160 summarizes parameters in the CTR_Clear message.

Table 160 CTR_Clear message

Parameter
AMAMeasurement (O)
Amp1 (O)
Amp2 (O)
BCMType (O)
Carrier (O)
Note: Parameters in shaded areas are not supported in this release.

Table 160 CTR_Clear message (Continued)

Parameter
CcId (O)
ClearCause (M)
ClearCauseData (O)
CollectedAddressInfo (O)
CollectedDigits (O)
ExtensionParameter (O)
FailureCause (O)
IPReturnBlock (O)
LegID (O)
PointInCall (O)
Note: Parameters in shaded areas are not supported in this release.

17.3.1 CTR_Clear message parameters

17.3.1.1 ClearCause parameter

The Parameter is sent to indicate why a connection between a user and a resource was terminated.

Table 161 ClearCause values

Clear Cause	parameter value
normal	0
invalidCode	7
failure	8
abort	18
invalidLeg	5
userAbandon	6
originateCall	23
Note: Parameters in shaded areas are not supported in this release.	

Table 161 ClearCause values

Clear Cause	parameter value
splitLeg	24
moveLeg	25
mergeCall	26
disconnectLeg	27
success	28
reconnect	29
Note: Parameters in shaded areas are not supported in this release.	

17.3.1.2 LegID parameter

The LegID parameter contains the numeric value corresponding to the leg which interacted with the resource.

Table 162 LegID values

LegID	parameter value
ControllingLeg	0
PassiveLeg(1)	1
PassiveLeg(2)	2
Note: Parameters in shaded areas are not supported in this release.	

17.3.1.3 CcID parameter

The CcID parameter identifies the call configuration (CC) of the controller when the CTR_Clear message is sent.

Table 163 CcID values

Call Configuration	parameter value
stable2Party	2
threePartySetup Complement	5
Note: Parameters in shaded areas are not supported in this release.	

Table 163 CcID values

Call Configuration	parameter value
partyOnHold	6
partyOnHold Complement	7
callWaiting	8
callWaitingComplement	9
stableMParty	10
transfer	11
forward	12
Note: Parameters in shaded areas are not supported in this release.	

17.3.1.4 BCMType parameter

The BCMType parameter is sent to provide an indication of whether the leg is passive leg (for which the midcall event is detected and CTR message is received from the SCP) in the Originating or Terminating BCM.

Table 164 BCMType values

Controlling Party BCM	parameter value
oBcm	0
tBcm	1
Note: Parameters in shaded areas are not supported in this release.	

17.3.1.5 PointInCall parameter

The PointInCall (PIC) parameter contains the numeric value corresponding to the PIC from which the MidCall event was detected according to the AIN call model described in Section 3 of GR1298.

Table 165 PointInCall values

PointInCall	parameter value
O_Active	9
T_Active	16
Note: Parameters in shaded areas are not supported in this release.	

17.3.1.6 CollectedDigits parameter

The CollectedDigits parameter is sent to the SCP to provide the digits collected from the user. These digits do no necessarily correspond to an address.

The CollectedDigits parameter is not present when the Carrier parameter is present.

17.3.1.7 CollectedAddressInfo parameter

The CollectedAddressInfo parameter provides the address information collected from the user.

The CollectedAddressInfo parameter contains the address digits collected from the connection, with the appropriate Nature of Number coding. The SSP only includes the CollectedAddressInfo parameter if the SCP/Adjunct requested “normal number of digits” with nature of address coding.

17.3.1.8 Carrier parameter

The Carrier parameter provides the carrier selection information and the primary carrier identification to which a call is routed. The Carrier parameter uses the CarrierFormat parameter format.

The Carrier parameter is included only when the SCP/Adjunct requested “normal number of digits” and a user dialed a 10XXX or 101XXXX code. The carrier collected with normal digit collection appears as collectedAddressInfo.

17.3.1.9 FailureCause parameter

The FailureCause parameter is sent to indicate that the CTR message could not be processed due to unavailability of a hardware or software resource.

Table 166 FailureCause values

Failure Cause	parameter value
unavailableResources	2
Note: Parameters in shaded areas are not supported in this release.	

17.3.1.10 AMA Measurement parameter

The AMA Measurement parameter indicates the start date, start time and the total connect time of an interaction between a user and a resource through the AMATimeDuration field. The AMAMeasurement parameter also contains a timing guard field that serves as an error check for the AMATimeDuration field.

17.4 Arming of events in CTR message

O_Disconnect and O_Disconnect_Called are the valid Events that can be armed in the CTR message. These Events can be armed when CTR is received in response to an OCM event. If the Event is invalid or if the valid Events are armed in the wrong Call model, then the Events are Closed and Close messages are not sent to the SCP. The life of these Events are limited to the life of this resource interaction. The Events can be detected only when the user is interacting with the resource because of the CTR. If the Events are not detected, then the Events are closed and the Close message is no sent to SCP.

17.5 User Abandon during CTR Interaction

If any party in the call abandons during CTR processing or after CTR_Clear is sent, then CTR_Clear with clear cause of “userAbandon” is sent to SCP.

18 Toll-free service

This chapter describes the Service Enablers' implementation of toll-free service.

18.1 Product view

Toll-free service implements two functional sets: the EAEO SSP Operation FS and the AT SSP Operation FS.

The functions that are unique to the EAEO SSP Operation FS are described in Section 18.5 "EAEO SSP operations" on page 643. The functions that are unique to the AT SSP Operation FS are described in Section 18.6 "AT SSP operations" on page 644. The functions that are common to both are described in Section 18.3 "Common functions" on page 630.

18.2 Overview

Service Enablers' toll-free service implements the requirements specified in *GR-2892-CORE, Switching and Signaling Generic Requirements for Toll-Free Service using Advanced Intelligent Network*, Issue 1, Bellcore, April 1995, which identifies the subset of AIN 0.2 SSP functions and how they are combined to provide toll-free service.

Until recently, toll-free numbers in North America were implemented according to *TR-NWT-000533, Database Services Service Switching Point-Toll-Free Service*, Issue 3, Supplement 1, Bellcore, April 1995. The Nortel Networks implementation of TR-533 for the US market is called E800. The Nortel Network implementation for the Canadian markets is called 800P. With Service Enablers' toll-free service, it is possible to access the full suite of AIN functionality and build more sophisticated services than was possible with TR-533. However, TR-533 may remain in use by operating companies when only basic toll-free service is needed.

Service Enablers' toll-free service was, until recently, targeted at the US market only and was called AIN TFS for E800. It is now implemented for the Canadian market, the functionality being called AIN TFS for 800P.

18.2.1 Functional overview

Service Enablers' toll-free service, allows the originating switch to:

- identify GR-2892 calls by using the TFSSCRN table and POTUSE=TFS in the TRIGDIG or TRIGITM tables
- build the SCP or adjunct query with GR-2892 specific parameters
  - — If ANI fails, or if there are missing ANI digits in a GR-2892 toll-free call, the system assigns 3, 6, or 10 digit ANI to the ChargeNumber parameter in the query message.
  - — If a GR-2892 toll-free call contains single digit station information, the system converts it to ANI II as the ChargePartyStationType parameter in the query message.
- route calls according to GR-2892 rules

  Toll-free routing on AIN Service Enablers is enhanced to provide equivalence to existing E800 routing functionality.
- create billing records that allows the call to be charged to the owner of the toll-free number rather than originator of the call

Service Enablers's toll-free service provides similar functionality to the existing toll-free service and creates, in combination with AIN functionality, the desired service offering.

Service Enablers' toll-free service is not part of the AIN Essentials product. It takes on all the attributes of Service Enablers unless otherwise stated. It is controlled by the AIN Service Enablers release SOC option.

18.2.2 Limitations

See Section 20.5 "Toll-free service limitations" on page 682 for limitations associated with AIN Service Enablers toll-free service.

18.3 Common functions

This section describes the functions that are common to both Access Tandem (AT) SSP operations and EAEO SSP operations of Service Enablers' toll-free service. They are:

- call identification
- general messaging
- database query (Info_Analyzed) processing
- Analyze_Route response processing
- Send_To_Resource response processing
- ACG response processing
- Send_Notification processing

- call routing
- Termination_Notification processing
- AMA
- feature interactions
- error handling
- memory administration
- timing requirements
- network testing and surveillance maintenance measurements
- TRAVER
- network traffic management controls
- network traffic management data
- data collection
- software optionality control (SOC)
- default routing

Each of these functions implement an FSS that is common to both FSs that make up AIN Service Enablers' toll-free service.

18.3.1 Call identification

Through switch provisioning, operating companies can distinguish between TR-533 and GR-2892 calls at the following levels:

- separation at 3 digits level

  For example, all of 800 is TR-533 while all of 866 is GR2892.

- separation based on 6 digits

  — For example, within the 866 code, the numbers starting with the 000 to 721(that is, 866000 to 866721) are TR-533 while the numbers starting from 722 to 999 (that is 866722 to 866999) are GR-2892.

  — For example, within the 877 code, the numbers from 000 to 621 and 750 to 999 (that is, 877000 to 877621 and 877750 to 877999) are TR-533 while the numbers from 622 to 749 (that is, 877622 to 877499) are GR-2892.

See Section 18.7 "Provisioning guidelines" on page 646 for more details on provisioning the numbers to be processed by AIN Service Enablers' toll-free service. Numbers to be processed by AIN Service Enablers' toll-free service must also have an SDS trigger assigned to them in the TRIGDIG or TRIGITM tables.

Note: In AIN Service Enablers, the Specific_Digit_String (SDS) trigger is equivalent to the PODP trigger in AIN Essentials. TRAVER and other provisioning tools may use the term PODP to refer to the AIN Service Enablers' SDS trigger.

After detection, GR-2892 calls are processed as any other AIN Service Enablers call with the exceptions described in Section 18.3.3 "Database query processing" on page 633 and in Section 18.3.5 "Call routing" on page 634.

18.3.2 General messaging

Toll-free service uses a subset of AIN Service Enablers messaging. See Table 167.

Table 167 Service Enablers' toll-free service messages

Message	Sending entity	Package type	Component type
Info_Analyzed	SSP	Query	Invoke (Last)
Analyze_Route	SCP	Response	Invoke (Last)
Send_To_Resource	SCP	Response	Invoke (Last)
Termination_Notification	SSP	Unidirectional	Invoke (Last)
Send_Notification	SCP	Conversation	Invoke (Last)
ACG	SCP	Unidirectional	Invoke (Last)

As a non call-related message, ACG can also come with either Analyze_Route or Send_To_Resource. As a conversation message, Send_Notification may also come with Analyze_Route.

Other valid response messages are required by GR-1298 but not by GR-2892. See Table 168.

Table 168 Other valid SCP responses to Info_Analyzed

Message	Sending entity	Package type	Component type	AIN call processing
Continue	SCP	Response	Invoke (Last)	call treatment
Disconnect	SCP	Response	Invoke (Last)	call treatment
Collect_Information	SCP	Response	Invoke (Last)	
Note: Messages in shaded areas are not supported in this release.				

In a toll-free call, a Continue message from the SCP in response to Info_Analyzed typically leads to call termination because no correct routing information is provided.

Request_Report_BCM_Event is a valid response message that may come with either Analyze_Route or Continue. It is the SCP request to arm SSP with NEL. It does not affect toll-free messaging. However, it may affect routing when EDP requests such as O_Called_Party_Busy and Network_Busy are encountered. When such a case occurs, it is handled as a normal AIN call with no toll-free specific processing.

The toll-free service uses a subset of AIN Service Enablers message parameters. Even though only a subset of the AIN Service Enablers parameters are actually required, toll-free messages contain the full set of parameters supported by AIN Service Enablers.

18.3.3 Database query processing

See Table 41 on page 204 for the Info_Analyzed message parameters.

See Section 6.4.4.19.14 “ChargeNumber parameter” on page 227 and Section 6.4.4.19.15 “ChargePartyStationType parameter” on page 230 for a description of the method of determining these parameters.

Although it is not explicitly mentioned in GR-2892, AIN Service Enablers’ toll-free service provides functionality equivalent to IN toll-free service for the conversion of 00Y codes into an NPA and a toll-free code. This requirement is for calls received at an AT SSP from nonconforming end offices using the 800 SAC.

18.3.4 Analyze_Route processing

See Table 74 on page 262 the Analyze_Route message parameters. See also Section 6.4.4.19.14 “ChargeNumber parameter” on page 227 and Section 6.4.4.19.15 “ChargePartyStationType parameter” on page 230.

AIN Service Enablers’ toll-free service for E800 routes the call based on the called party, carrier and trunk group information contained in the Analyze_Route message and not on the original called party sent in the query. In cases where the AIN TFS functionality is deployed for the US market or E800, the Analyze_Route message must identify which carrier or trunk group to use to route the toll-free call. If neither a carrier nor a trunk group is provided, the call is routed to treatment.

AIN Service Enablers’ toll-free service for 800P routes the call based on the called party information contained in the Analyze_Route message and not on the original called party sent in the query. In cases where AIN TFS for 800P is

deployed, the carrier parameter is not mandatory in the Analyze_Route message.

When the ChargePartyStationType and/or ChargeNumber parameter is not present in the Analyze_Route response, the ChargePartyStationType depends on the triggering agent rather than the line attributes associated with the toll-free trigger. AIN TFS uses the original values in the query for the ChargeNumber.

Depending on the CalledPartyID in the Analyze_Route response, the following logic applies to the ANI or FANI information digits outpulsed over the equal access (EA) carrier:

- When the CalledPartyID is a POTS routing number, then the ANI II digits is 25 for a Pay Phone line and 24 for all other originators.
- When the CalledPartyID is a toll-free number, use the ANI II (ChargePartyStationType) in the original AIN TFS query.

18.3.5 Call routing

Service Enablers' toll-free routing provides equivalent functionality to existing E800 routing by building on existing AIN Service Enablers functionality.

Toll-free routing must bypass normal AIN equal access screening on the routing number to allow local calls to be routed to an interexchange carrier. Toll-free routing makes use of existing tables to provide this functionality. See Section 51.6.4 "Bypassing screening on the routing number" on page 1089.

AIN Service Enablers allow Analyze_Route messages to be returned from the SCP without a carrier present. Toll-free routing for AIN TFS for E800 (U.S. market) requires that a carrier be present in the response if a trunk group parameter is not present. If there is no trunk group and no carrier, the call is sent to AIN final treatment. For AIN TFS for 800P (Canadian market), a carrier or trunk group is not mandatory in the Analyze_Route message.

CarrierUsage functionality is not supported for AIN Toll free services. When an AIN TFS number returned in the response message is associated with the carrier, parameter CarrierUsage is set to 'AlwaysOverride(O)'.

18.3.6 AMA

Toll-free service on AIN uses AIN Service Enablers AMA records. TR-533 specific AMA records are not used.

GR-2892 follows the usual TR-1284 and GR-1298 billing procedures for the AIN Service Enablers SDS trigger. The SSP expects to receive an AMAslpID and an AMALineNumber in the Analyze_Route response and outputs structure code 0220 in response, including the AMALineNumber in module

code 307. If the call goes to an IXC, module code 021 is included in the billing record to identify the carrier used.

GR-2892 states that it is not expected that billing information is sent to the SSP in a Send_To_Resource message associated with an announcement. However, if billing is provided in an STR message (either associated with an announcement or sending the call to an IP), AIN Service Enablers toll-free service generates AMA in the same fashion as any other call using the AIN SDS trigger as described in Section 11.3 “Billing” on page 482.

See Chapter 6: “Billing” on page 227 for additional details.

18.3.7 Feature interactions

See Section 4.20 “Toll-free service interactions” on page 290.

18.3.8 Error handling

See Chapter 19: “Error handling” on page 647.

18.3.9 Memory administration

See Chapter 6: “SSP engineering” on page 311.

18.3.10 Timing requirements

Although AIN Service Enabler’ toll-free service does consume more real time processing than an equivalent TR-533 call, it meets the connect time requirements specified in GR2892. See Chapter 6: “SSP engineering” on page 311.

18.3.11 Network testing and surveillance maintenance measurements

Service Enablers’ toll-free service calls use AIN Service Enablers OMs with existing office wide measurements. See Table 169.

Table 169 GR-2892 requirements and current toll-free service OM implementation

OM description in GR-2892	TR-533 equivalent (Group=NSC)	AIN implementation (Group=AIN)	Office wide implementation Group/OM
Failure to obtain ANI on a CAMA Trunk	not applicable	not applicable	TRK / ANF
Failure to Receive Second Signaling Stage on an EA Trunk	NSCSFLEA	not applicable	EACARR / EAWNKFL
Call Processing failure Before Initial Query	NSCFPRIQ	CPFLBFQ	Not directly pegged by Service Enables toll-free service

Table 169 GR-2892 requirements and current toll-free service OM implementation (Continued)

OM description in GR-2892	TR-533 equivalent (Group=NSC)	AIN implementation (Group=AIN)	Office wide implementation Group/OM
Call Processing failure After Initial Query	not applicable	CPFLAFQ	Not directly pegged by Service Enables toll-free service
Resource Unavailable Before Initial Query	NSCTIOVF	TIOVFBFQ	Not directly pegged by Service Enables toll-free service
Resource Unavailable After Initial Query	Not directly pegged by Service Enables toll-free service	TIOVFAFQ	Not directly pegged by Service Enables toll-free service
Announcement System Unavailable	not applicable	not applicable	ANN / ANNOVFL
Announcement Number Unavailable	not applicable	not applicable	not applicable
Network Management Control Blocks Call	NSCBKSIC	BLKCASCP BLKCASMS	Not directly pegged by Service Enables toll-free service
Signaling Failure	NSCFLTO	RSPTMOUT	Not directly pegged by Service Enables toll-free service
Invalid Command Message	NSCFLICM	INVCMDMG	Not directly pegged by Service Enables toll-free service
Invalid Command Sequence	NSCFLICS	INVCMDSE	Not directly pegged by Service Enables toll-free service
Return Error or Reject component	not applicable	not applicable	not applicable
Abandon Before Outpulsing	NSCABNBS	not applicable	TRK /PRERTEAB
Abandon After Outpulsing	NSCABNAS	not applicable	Not directly pegged by Service Enables toll-free service
All IXC Trunks Busy	not applicable	not applicable	TRK / SUB
All TelCo Trunks Busy	not applicable	not applicable	TRK / SUB

Table 169 GR-2892 requirements and current toll-free service OM implementation (Continued)

OM description in GR-2892	TR-533 equivalent (Group=NSC)	AIN implementation (Group=AIN)	Office wide implementation Group/OM
Number of calls	NSCORIG, NSCATMPT	TRIG	Not directly pegged by Service Enables toll-free service
Number of calls from other offices	NSCATIN	TRIG	Not directly pegged by Service Enables toll-free service

There are three OM registers specified in GR-2892 that are unsupported:

- Announcement Number Unavailable
- Abandon After Outpulsing
- Return Error or Reject Component

AIN routes call to treatment (reorder tone) when it receives an unknown announcement id from an SCP.

18.3.11.1 ACG and Related OMs

Toll-free service uses the existing AIN Service Enablers ACG and its related OMs. The GR-2892 and GR-1298 concept of ACG differs significantly from the one for TR-533. See Chapter 8: “Network management” on page 287 for more information.

18.3.12 E800VER

E800VER detect AIN Service Enablers’ toll-free calls and advises the user to use AIN tools for verification.

18.3.13 TRAVER

TRAVER supports the TFSSCRN table. TRAVER displays the TFSSCRN table content and simulates the path of AIN Service Enablers’ toll-free call. Figure 112 shows a sample TRAVER output if the SOC option is on, the trigger group provisioning interface is used and table TFSSCRN has a relevant tuple.

Figure 112 Sample output of TRAVER for a toll-free call

```
>traver l 6213811  18008112000 b
.
Note: Lines deleted in the front to show part relevant to the subject

TABLE STDPRTCT
P621 ( 1) (65021) 0
 . SUBTABLE STDPRT
 . 1800811 1800811 N DD 1 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HNPACONT
613 Y 997 1 ( 272) ( 1) ( 84) ( 0) 0
 . SUBTABLE HNPACODE
 . 800 800 NSC E800
TABLE TFSSCRN
800 811 811
AIN Info Collected TDP: no subscribed trigger.
TABLE TRIGGRP
CUSTTRIGGRP_CDP INFOANAL
 . CDPCODE ( DG CDPDIG)$ NIL
Trigger R01 CDPCODE is applicable to customer group.
TABLE TRIGGRP
OFCTRIGGRP_ALL INFOANAL
 . N11 ( DG N11DIG)$ NIL
Trigger R01 N11 is applicable to office.
 . PODP ( DG PODPDIG)$ NIL
```

Figure 113 Sample output of TRAVER for a toll-free call (Continued)

```
AIN Info Analyzed TDP: trigger criteria met
Querying the database would occur now.
Use the AINMQG option to save the query to a file for use in TstQuery.
Use the AINRES option for further information
```

Figure 114 on page 639 shows a sample TRAVER output if the SOC option is on, but table TFSSCRN does not have a relevant tuple.

Figure 114 Sample output of TRAVER for a toll-free call

```
>traver l 6211811 18008552000 b
TABLE LINEATTR
300 1FR NONE NT FR01 0 613 EAP1 L613 TSPS 10 NIL NILSFC LATA1 0 NIL NIL 00 N
$
LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
TABLE DNATTRS
TUPLE NOT FOUND
TABLE DNGRPS
TUPLE NOT FOUND
TABLE LENFEAT
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP OFCTRIGGRP_ALL
AIN Orig Attempt TDP: no subscribed trigger.
TABLE STDPRTCT
EAP1 ( 1) (65021) 3
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING.  CALL TYPE DEFAULT IS NP.  PLEASE REFER TO
DOCUMENTATION.
 . 18 19 N DD 1 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HNPACONT
613 Y 999 1 ( 278) ( 1) ( 84) ( 0) 3
 . SUBTABLE HNPACODE
 . 800 800 NSC E800
```

Figure 115 on page 640 shows a sample TRAVER output if the SOC option is idle, and table TFSSCRN has a relevant tuple.

Figure 115 Sample output of TRAVER for a toll-free call

```
traver l 6211611 18008112000 b
TABLE LINEATTR
300 1FR NONE NT FR01 0 613 EAP1 L613 TSPS 10 NIL NILSFC LATA1 0 NIL NIL 00 N
$
LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
TABLE DNATTRS
TUPLE NOT FOUND
TABLE DNGRPS
TUPLE NOT FOUND
TABLE LENFEAT
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP OFCTRIGGRP_ALL
AIN Orig Attempt TDP: no subscribed trigger.
TABLE STDPRTCT
EAP1 ( 1) (65021) 3
 . SUBTABLE STDPRT
WARNING: CHANGES IN TABLE STDPRT MAY ALTER OFFICE
BILLING.  CALL TYPE DEFAULT IS NP.  PLEASE REFER TO
DOCUMENTATION.
 . 18 19 N DD 1 NA
 . SUBTABLE AMAPRT
 . KEY NOT FOUND
 . DEFAULT VALUE IS:   NONE OVRNONE  N
TABLE HNPACONT
613 Y 999 1 ( 279) ( 1) ( 84) ( 0) 3
 . SUBTABLE HNPACODE
 . 800 800 NSC E800
TABLE TFSSCRN
800 811 811
AIN00220 IS IN IDLE STATE: TRAVER IS NOT
SIMULATING THE CURRENT CALL PROCESSING PATH
AIN Info Collected TDP: no subscribed trigger.
TABLE TRIGGRP
OFCTRIGGRP_ALL INFOANAL
 . N11 ( DG N11DIG)$ NIL
Trigger AIN N11 is applicable to office.
 . PODP ( DG PODPDIG)$ NIL
```

18.3.14 Network traffic management controls

This function provides the SSP with SCP Overload Control, SMS Originated Code Control, ACG control mechanics, sequence of controls, SCCP

procedures for ACG messages and SOCC controls. See Chapter 8: “Network management” on page 287.

18.3.15 Network traffic management data

This function provides the SSP with capabilities to collect data on the basis of trigger items. See Section 11.2 “AINACG OM group” on page 331.

18.3.16 Software optionality control

AIN Service Enablers toll-free service is controlled by the same SOC option as for the rest of AIN Service Enablers. If the SOC option is in IDLE state, any AIN Service Enabler trigger (including toll-free service) would not be encountered, and call processing would continue as if the trigger was not there.

In addition, if the SOC option is IDLE, customers are able to datafill the TFSSCRN table but toll-free service processing does not occur. However, TRAVER does simulate the path of a toll-free call. Warning messages are issued to indicate that this is not the current call processing path.

18.3.17 Default routing

If an AIN toll-free call is sent to the default route it is handled the same way as any other call that uses the SDS trigger and routes to the datafilled announcement or directory number.

The processing of default routing includes checking for SDS triggers, so if an AIN toll-free number is provided as the default route it triggers and sends a query. If an Analyze_Route message is returned, the call then proceeds as a normal toll-free call.

If an AIN toll-free call is allowed to proceed based on the dialed toll-free number, (for example, if a Continue message is received in response to an AIN toll-free query) then the call is routed to treatment since it is not possible to determine the desired destination of the call. This is accomplished by setting a default route reference on all AIN toll-free calls as described in Section 51.6.2.2 “Failure path” on page 1087.

18.4 Support of 800P functionality by AIN TFS

This section describes the support of 800P functionality by AIN TFS.

With the current available AIN framework, it is not possible to support the exact equivalent of the 800P services. Therefore, these services have some limitations. Exact 800P equivalent functionality may not be provided.

800 Plus has many capabilities specific to the Canadian market beyond those detailed in Telcordia (Bellcore) specification TR 533. AIN TFS is implemented in Canadian loads to support basic 800P and the following functionalities:

18.4.1 End Office Display

The End Office Display functionality provides the subscriber with the display of the toll free dialled number ID(DNID). DNID allows an 800P subscriber to identify that a toll free DN is being dialled. If the subscriber has several 800P services, or multiple toll free numbers, it also allows the subscriber to identify the service or toll free number that the caller selects.

To implement this functionality, the **GA Type 253 parameter is supported by AIN**. When the GAL parameter containing GA type 253 is received from the SCP in Analyze_route response, the AIN implementation builds a GAP in the outgoing ISUP IAM message. The GA type 253 in GAL contains the 800P number dialled. The end office looks at the GA type 253 parameter received and displays the dialled number.

Note: The terminator in the switch on which the 800P call lands has to support the End Office Display functionality.

18.4.2 Overflow Call Routing

Overflow Call Routing (OCR) specifies alternate terminating DNs for a toll free number. Subscribers can divert calls when the primary toll free number is busy or does not answer. This functionality is supported by AIN TFS using OCPB, ONOA, and Netbusy NELs and Analyze_Route response.

18.4.3 Courtesy Call functionality

This functionality plays a voice announcement to Toll free number callers. Courtesy Response corresponds to one of the destination addresses in the Overflow Routing List (OCR). The AIN implementation of Courtesy Response is the last Analyze_Route response to an OCPB/ONOA NEL (AIN implementation of OCR). The called number in the Analyze_Route corresponds to the voice mail system. This functionality can also be provided by the STR-IP response. The IP can be used to provide announcements to the originator.

18.4.4 Call Prompter

This functionality lets toll free callers select specific answering locations using touchstone buttons on their telephones. Call prompter system is used to route the call to a meridian mail system. The MM system prompts the caller to enter digits and then it transfers the call to the selected service.The AIN implementation provides the correct ‘Call Prompter System’ DN in the Analyze_Route response.

This functionality can also be provided by the STR-IP message. The IP can be used to provide announcements to the originator, digits can be collected and sent back in a Resource_Clear message. SCP can further analyze and send a message based on how the call should proceed.

18.4.5 Northbound functionality

The Northbound functionality lets 800 calls that originate from continental U.S. (including Alaska and Hawaii) terminate on a subscriber's line in Canada. It also allows domestic callers in the customer network to make toll free calls to the destinations inside the customer network.

For northbound calls, the incoming IAM must contain a CHG or CPN parameter (or both). If the CPN parameter is not present and the CHG parameter is present, the CHG parameter will be converted to the CPN parameter for querying purposes.

18.4.6 Southbound functionality

The southbound functionality lets 800 calls originated from the Canadian customer's office be routed to the US over ISUP trunks. The CPN parameter is converted into the CHG number parameter and built in the outgoing ISUP IAM.

Southbound functionality was implemented as part of feature AG1027 where it was assumed that direct trunking to US carriers of interest was available at each Service Switching Point (SSP) . The Carrier ID returned in the SCP response message is checked against the IDs datafilled in table NSCCARR. If the ID is not found, it is assumed to be invalid and the southbound 800 call is blocked.

AIN on TFS is implemented by introducing the parameter Special Routing Parameter as a sub parameter of the AIN extension parameter. This parameter determines if the call is southbound or not. This parameter is sent in the AR message from the SCP. The SCP must also send a carrier in the AR message. If the Special Routing Parameter = 'US assigned number' and the SCP returned carrier is datafilled in table NSCCARR, the southbound call is routed over the carrier. The CPN parameter is converted into the CHG number parameter and built in the ISUP IAM.

Parameters like Network Routing Number, Special Routing Code, and 0YY codes should not be returned in the called Party ID of the Analyze Route response, only the destination DN and carrier should be sent.

Note: For a southbound call, a carrier parameter in the Analyze_Route message is mandatory.

18.5 EAEO SSP operations

This section describes the implementation of the EAEO SSP Operations FS.

This section describes the toll-free detection function that is unique to EAEO SSP operations.

In this case AIN toll-free calls are detected and database queries are launched from an equal access end office (EAEO) with SSP functionality. The response message received from the SCP provides the information needed for the EAEO to route the call to the appropriate IXC or to handle the call within the LEC. The functions unique to this configuration are described below (functions common to EAEO SSP and AT SSP operation are described in the previous sections).

18.5.1 Toll-free detection

At an EAEO SSP toll-free calls are detected by a 3 to 6 digit AIN Service Enablers SDS trigger. AIN Service Enablers' toll-free calls may be made from any AIN Service Enablers supported line originating agent.

18.5.2 Call routing

In an EAEO SSP, based on the response received from the SCP, a toll-free call can be routed within the LEC or to an IXC either directly, if trunk groups are available, or through an AT. Equal access screening is not performed on the routing number sent to an IXC.

18.6 AT SSP operations

This section describes the implementation of the EAEO SSP Operations FS.

This section describes the functions that are unique to AT SSP operations. They are:

- EAEO toll-free detection
- CAMA EO toll-free detection
- LAMA EO toll-free detection

AT SSP operations covers the case where the toll-free call originates from an equal access end office that does not do a query and instead routes the call to an access tandem (AT) SSP. The AT SSP identifies the call as requiring SSP processing and launches a query to determine the IXC to send the call to, or the routing information within the LEC.

In this configuration, note that the AIN Service Enablers provides the handling of the call at the AT SSP (where the AIN toll-free service software resides) and that the AIN toll-free service software is not encountered in the EO. As a result the description below focuses on the behavior in the AT SSP.

18.6.1 CAMA EO - AT SSP toll-free detection

Toll-free calls from non-EA end offices that do not have the ability to generate AMA are routed to an AT SSP using CAMA trunks. AIN toll-free calls are identified at the AT SSP using a 3 to 10 digit SDS trigger. It may be necessary to derive parts of the ChargeNumber or ChargePartyStationType for the query

at the AT SSP as described in Section 18.3.3 “Database query processing” on page 633.

18.6.2 EAEO - AT SSP toll-free detection

If a toll-free call originates at an EAEO and is routed to an AT SSP for processing, normal equal procedures apply except that a carrier code (CIC) of 0110/110 is used. At the AT SSP, AIN toll-free calls are identified using a 3 to 10 digit SDS trigger in equal access translations. If required, the originating office code (NXX) used in the ChargeNumber in the query may be derived from the EA trunk group at the AT SSP as described in Section 6.4.4.14 “T_Busy event request message” on page 215.

18.6.3 LAMA EO - AT SSP toll-free detection

Toll-free calls from non-EA end offices that can generate local billing are routed to the AT SSP over a LAMA trunk. AIN toll-free calls are identified using a 3 to 10 digit SDS trigger as described above. Since the EO does billing, no ANI information is provided by the EO to the AT SSP and it is necessary to derive the ChargeParty and ChargePartyStationType for the query at the AT SSP as described in Section 6.4.4.19.14 “ChargeNumber parameter” on page 227 and Section 6.4.4.19.15 “ChargePartyStationType parameter” on page 230.

18.6.4 Detection of toll-free calls at TOPS SSP

At present, TOPS trunks and TOPS agents are not supported by AIN originating agents and cannot directly encounter the AIN SDS trigger where AIN toll-free processing occurs.

Incoming AIN toll-free calls on TOPS trunk groups need to be identified during translation and routed to an MF intertoll trunk that either:

- loops the call around to the same office if it is a combined TOPS and AIN SSP, or
- sends the call to another switch that is an AIN SSP

As well, all toll-free calls (E800 or AIN) where a TOPS agent is the originator must be sent to a similar looparound trunk.

The required datafill is described in Section 51.6.5 “Additional datafilling for TOPS offices” on page 1092.

18.6.5 Call routing

From an AT SSP, the call must be routed either directly to the IXC indicated in the query response or to a destination within the LEC. Equal access screening is not applied to the routing number.

18.7 Provisioning guidelines

See Section 51.6 “Provisioning guidelines” on page 1085.

19 Error handling

19.1 Error detection

There are four basic types of errors detected by the AIN Service Enablers SSP: protocol errors, application errors, resource failures and AIN call processing failures.

- Protocol errors—these occur when the TCAP format of a received message is incorrect.
- Application errors—these occur when the TCAP message is correct (that is, no protocol error occurred) but the application does not know how to handle the message because it is logically inconsistent or the message is received after the response timer expired.
- Resource failures—these occur when the SSP is unable to process a response from an off-board processor because of the state of the resources required to process the message.
- AIN call processing failures—these occur when the SSP is unable to complete the call under the current conditions and the call is routed to treatment.

Depending upon the type and cause of an error, protocol errors, application errors and resource failures may be treated as fatal or nonfatal.

- Fatal errors—these occur when a message received from an off-board processor cannot be processed or because the response message timer expires. When the SSP detects a fatal error, it can report the error to the off-board processor.
- Non-fatal errors—these occur when the operation requested by a received message can be performed using normal procedures, in spite of the error. A non-fatal error is reported to the off-board processor only when the message from the off-board processor causes a transaction to remain open.

19.1.1 Protocol errors

The following table lists protocol errors supported by AIN Essentials. The details of detection and causes of protocol errors are considered specific to the TCAP protocol and beyond the scope of this document. See Section 4 of

GR-1299-CORE for more information on these errors. A list of protocol errors and their effect is shown in Table 170.

Note: Shading indicates areas that are not supported.

Table 170 Protocol errors

Protocol error	Error type
Badly Structured Component Portion	fatal
Badly Structured Transaction Portion	fatal
Incorrect Component Portion	fatal
Incorrect Parameter	nonfatal
Incorrect Transaction Portion	fatal
Missing Mandatory Parameter	fatal (see Note below)
Underivable Transaction ID	fatal
Unrecognized Component Type	fatal
Unrecognized Correlation ID	fatal
Unrecognized Operation Code	fatal
Unrecognized Package Type	fatal
Unrecognized Transaction ID	fatal
Note: When a missing mandatory parameter fatal protocol error is detected by the SSP, the SSP maps it to incorrect parameter and reports the error as a fatal protocol incorrect parameter error.	

When a fatal protocol error is detected anywhere in a received message, the SSP discards the entire received message and applies AIN final treatment. The SSP reports the error to the off-board processor if the message was received in a Query or Conversation package. The error is reported to the off-board processor in an Abort package if the fatal protocol error is detected in the transaction portion of the message, or in a Response package if the fatal protocol error is detected in the component portion of the message. Protocol errors detected in a Response, Abort or Unidirectional package are not reported to the off-board processor.

When a nonfatal protocol (incorrect parameter) error is detected by the SSP, the SSP discards the incorrect optional parameter and continue normal call processing.

19.1.2 Application errors

The AIN Essentials SSP checks for application errors after checking for protocol errors. The following table lists application errors supported by AIN Essentials SSP. A list of application errors and their effect is shown in Table 171.

Table 171 Application errors

Application error	Error type
Unexpected Message Sequence	fatal
Unexpected Parameter Sequence	fatal
Unexpected Communication	fatal or nonfatal
Unexpected Message	fatal
Erroneous Data Value	fatal or nonfatal
Missing Conditional Parameter	fatal or nonfatal
Response Message Timer Expired	fatal

- Unexpected Message Sequence—The SSP receives a TCAP package that contains a call related message from the SCP, and that call-related message is not the first message in the TCAP package.
- Unexpected Parameter Sequence—The SSP receives a message from the off-board processor and the parameters in the message do not appear in the required sequence. This is a fatal error.
- Unexpected Communication—This error may be fatal or nonfatal depending upon these conditions:
  - — Fatal: The SSP receives a message in a TCAP package that is NOT allowed for that message (for example, Analyze Route message received in a Query package).
  - — Fatal: The SSP receives a message in a Response package, where the type of message is allowed for a Response package but it should have been sent in a Conversation package (for example, a Send to Resource message that requests digit collection).
  - — Nonfatal: The SSP receives a message in a Conversation package, where the message is allowed for a Conversation package but it should have been sent in a Response package (for example, a Send to Resource message that requests an announcement to be played followed by a disconnect).

- Unexpected Message—This error is always fatal and occurs under the following conditions:
  - — The SSP receives a response that is not allowed for the previously sent query message.
  - — The TCAP package received contains more than one call related message.
  - — The TCAP package received contains more than one message of the same type.
- Erroneous Data Value—The SSP receives a message that contains an invalid parameter value. The SSP drops the invalid parameter. If dropping the invalid parameter does not allow further response processing to be performed, this is a fatal error. Otherwise, the error is treated as nonfatal. The invalid parameter may be mandatory or optional.
- Response Message Timer Expired—The response message timer timed out before the message was received by the SSP. This is a fatal error.
- Missing Conditional Parameter—The response received cannot be processed because of a missing conditional parameter. If response processing cannot continue without the missing parameter, the error is treated as a fatal error. Otherwise, the SSP treats the error as nonfatal.

A list of the optional parameters whose presence is mandatory when certain other parameters are present in the same message, is shown in Table 172.

Table 172 Missing conditional parameters check

Missing conditional parameter	Parameter present
PrimaryTrunkGroup	PrimaryBillingIndicator
PrimaryCarrier	OverflowBillingIndicator
AlternateTrunkGroup	AlternateBillingIndicator
AlternateCarrier	OverflowBillingIndicator
SecondAlternateTrunkGroup	SecondAlternateBillingIndicator
SecondAlternateCarrier	OverflowBillingIndicator
PrimaryTrunkGroup	AlternateTrunkGroup
AlternateTrunkGroup	SecondAlternateTrunkGroup
PrimaryCarrier	AlternateCarrier
AlternateCarrier	SecondAlternateCarrier

When a fatal application error is detected by the SSP, the SSP shall discard the component in error and continue processing other components, if present. If a fatal application error is detected in the call-related component, the SSP applies AIN Final Treatment to the call.

The SSP reports the fatal application error to the off-board processor if the message was received in a Query, Conversation, or Response package. If the TCAP transaction is open and the fatal application error is detected in the call-related component, the error is reported in a Response package with a Return Error component. If the TCAP transaction is open and the fatal application error is detected in a noncall-related component of a multi-component message, the error is reported in a Conversation package with a Return Error component. If the TCAP transaction is closed, the fatal application error is reported in a Unidirectional package with an Invoke (Last) component and a Report Error operation code.

When a nonfatal application error is detected by the SSP, the SSP ignores the error and continue normal call processing.

For application errors during STR connection to an IP, see Section 19.3 “Events exceptions and errors” on page 655.

19.1.3 Resource failures

Resource failures occur when the SSP receives a message from an off-board processor that contains no protocol or application errors but the SSP cannot process the message due to the unavailability or failure of switch hardware or software resources.

There are two resources considered here: announcements and AIN Essentials software resources.

19.1.3.1 Announcements

- If the System Announcement Identifier received in the StrParameterBlock parameter of the Send to Resource message corresponds to an announcement that is unavailable, the SSP does the following:
  - — If the unavailable resource occurred when the Send to Resource message was received with a Conversation package type, the SSP sends a Resource Clear message in a Conversation package to the

off-board processor indicating the announcement is unavailable. The SSP waits for a response from the off-board processor.

— If the unavailable resource occurred when the Send to Resource message was received in a Response package, reorder treatment is applied.

- If the System Announcement Identifier received in the StrParameterBlock parameter of the Send to Resource message does not correspond to an index defined in table AINANNS, the SSP does one of the following:

  — If the erroneous data occurred when the Send to Resource message was received in a Conversation package, the SSP returns an Application Error to the off-board processor indicating the error. AIN final treatment is applied to the calling party.

  — If the erroneous data occurred when the Send to Resource message was received in a Response package, the SSP applies final treatment to the calling party.

- If the StrParameterBlock does not contain digits that should be pronounced to the calling party and the customized announcement specifies that digits are to be pronounced, then only the announcement will be played.
- If the StrParameterBlock contains digits that should be pronounced to the calling party and the customized announcement is not datafilled to pronounce digits, then the digits received are discarded and the playing of the announcement continues.

In addition to announcements, a number of tones can be requested in Send_To_Resource. See NTP 297-5161-021, *Advanced Intelligent Network Essentials Service Implementation Guide*.

19.1.3.2 AIN software failures

If there is a failure to allocate sufficient feature data blocks, history data blocks, or history control blocks, a No Software Resource (NOSR) treatment is applied to the call.

If there is a failure to allocate sufficient AIN extra-large extension blocks or huge extension blocks, an AINF treatment is applied to the call and a SWERR log is generated.

If the SSP is unable to supply mandatory parameters for a message, the call is routed to AIN final treatment.

19.1.3.3 AIN Essentials call processing failures

AIN call processing failures occur when the SSP is unable to complete the call under the current conditions and the call is routed to treatment. Call processing failures related to AIN Essentials SSP are as follows:

- If digits dialed during processing of a Send to Resource response are incomplete or invalid, the SSP does not send a Resource Clear message and AIN final treatment is applied.
- If a call attempts to trigger more times than specified by the office parameter AIN_MAX_SERIAL_TRIGGERS, the call is given AIN final treatment.
- If the SSP receives an Analyze Route or Forward_Call message and
  - — the call cannot get the routing characteristic extension block, the call is routed to NOSR treatment
  - — an error is encountered during translations, the call is routed to the appropriate treatment
  - — all the possible routes are busy, the call is routed to Generalized No Circuit treatment
- If a Continue message is received from the off-board processor in response to Information Analyzed query message and the SSP does not have sufficient information to terminate the call (for example, the call triggered on a vertical service code so the SSP does not have any routing information), the call is routed to AIN final treatment

19.1.3.4 Non call-related failures

Two resources failures are associated with noncall-related features:

- The unavailableResources failure is sent to an off-board processor when an Update_Request message attempts to activate or deactivate a trigger for an nonsubscriber.
  - Monitor for change for lines and hunt groups, uses UnavailableResources as a failure message in the following scenarios
    - When the monitor request is meant for monitoring a hunt group and SOC option AIN00262 for hunt groups is not turned on.
    - When the monitoring of the facility in the monitor for change message is not supported by monitor for change (for example, a monitor request is received for a DLH hunt group).
    - When the parameters are not decoded by the application.
    - When parameter FacilityGID (and not parameter calledPartyID) is received in the Monitor message, but it does not contain the mlhg field.
    - When parameter bearer capability is received in the message, but is not supported by the agent involved.
    - When the agent is not supported by monitor for change. See Chapter 4: “Agent support” on page 127 for supported agents.
    - When parameter CalledPartyID is present in the monitor for change message, but it refers to a line that does not exist.
    - When parameter CalledPartyID is not present, parameter FacilityGID is present and maps to a hunt group that is not equipped or parameter FacilityGID is out of range (32768 or above).
    - When the facility to be monitored is unavailable for monitoring.
    - The maximum monitor limit of 2000 is reached.
    - A monitor request is received for a facility where five monitors have been previously set up.
- The rateTooHigh resource failure is sent to an off-board processor when an SSP receives more Update_Request messages than it can handle.

19.1.4 AIN Service Enablers call processing failures

Call processing failures as related to AIN Service Enablers are detailed in other chapters of this document. For errors related to STR using an IP, see Section 19.3 “Events exceptions and errors” on page 655.

In the event that the AIN CCS7 subsystem is out of service, all calls that generate an AIN query shall receive reorder (RODR) treatment.

19.2 Generic error handling

The AIN messaging component (GAME) handles protocol and most application errors.

When the AIN messaging component receives a message from the SCP that is not supported (that is, it is not implemented as part of AIN Service Enablers and was not supported in previous releases), the SSP returns an ‘Unexpected Message’ error to the SCP.

19.3 Events exceptions and errors

If the T1 timer expires prior to receiving a response to an event request message, a Close message is sent to the SCP or adjunct and the following behavior occurs:

- For a Network_Busy event request message, apply GNCT treatment.
- For a T_Busy event request message, apply busy tone to the originator.
- For a T_No_Answer event request message, continue to alert the called party.

If the user abandons the call prior to receiving a response to an event request message a Close message is sent to the SCP or adjunct and the SSP clears the call.

If the SSP receives an RRBCME that does not arm at least one EDP then a fatal Erroneous Data Value error is detected.

19.4 ACG error handling

Fatal application errors in an ACG component of a message results in the ACG message component being discarded. For multi-component messages, processing of other components in the message is unaffected. Likewise, when a fatal application error is detected in a call-related component, that component is discarded, and the ACG component is processed according to normal procedures.

In a scenario where the SSP receives a multi-component package including an ACG component and a call-related component, and the SSP determines that the call-related component should not be processed due to Software Optionality Controls (SOC), the ACG component is still processed.

Table 173 outlines the possible scenarios for fatal application errors in messages that contain an ACG component and for ACG_Global_Ctrl_Restore messages.

Table 173 Fatal application errors affects on ACG components

TCAP package type	Message component		Action
	Call related	Noncall-related	
Query	---	ACG_Global_Ctrl _Restore with fatal application error	discard message report error in response package.
Unidirectional	---	ACG with fatal application error	discard message no error reported
Conversation	STR	ACG with fatal application error	discard ACG component, process call-related component report ACG error in: - conversation package if transaction is open and Nonfatal Unexpected Communication condition is not associated with the TCAP Package - response package if transaction is open & Nonfatal Unexpected Communication condition is associated with the TCAP package - unidirectional package if transaction is closed.
Conversation	STR with fatal application error	ACG	discard call-related component, process ACG component report call-related error in response package

Table 173 Fatal application errors affects on ACG components (Continued)

TCAP package type	Message component		Action
	Call related	Noncall-related	
Conversation	STR with fatal application error	ACG with fatal application error	discard call-related and ACG components report call-related error in response package report ACG error in: - conversation package if transaction is open & Nonfatal Unexpected Communication condition is not associated with the TCAP Package; - response package if transaction is open & Nonfatal Unexpected Communication condition is associated with the TCAP package; - unidirectional package if transaction is closed.
Response	STR	ACG with fatal application error	discard ACG component, process call-related component report ACG error in unidirectional package
Response	STR with fatal application error	ACG	discard call-related component, process ACG component report CR error in Unidirectional package
Response	STR with fatal application error	ACG with fatal application error	discard call-related and ACG component report call-related error in unidirectional package report ACG error in unidirectional package

19.5 Create_Call error handling

Any failure reported to the SCP resulting from the Create_Call message received in a query package comes in a response package. The system generates a return error component with an error code of FailureReport.

19.5.1 Create_Call with unsupported parameters

When the SSP receives a Create_Call query containing valid, but unsupported parameters, the SSP discards the unsupported parameters and continues processing the request.

19.5.2 Create_Call message with protocol error

When a Create_Call message contains a protocol error, the SCP receives the error report (when appropriate). No treatment is applied to a user, because there is no user at that time.

When a fatal protocol error is detected anywhere in a received message, the SSP discards the entire received message. The error is reported to the off-board processor in an abort package when the fatal protocol error is detected in the transaction portion of the message, or in a response package when the fatal protocol error is detected in the component portion of the message.

19.5.3 Create_Call message with missing mandatory parameter

When a Create_Call message contains no CallingPartyID or CalledPartyID, this information is reported to the SCP as fatal protocol error MissingMandatoryParameter through a response package with a Reject component. No treatment is applied to a user, because there is no user at this time.

19.5.4 Create_Call received in conversation or response package

When a Create_Call message is received in a conversation or response package in response to a previous query, the SSP treats this information as a fatal application error. A fatal application error message with cause value UnexpectedMessage goes to the SCP and the call from which the transaction was launched goes to AIN final treatment. When the TCAP transaction is open, the error is reported in a response package with a Return error component. When the TCAP transaction is closed, the fatal application error is reported in a unidirectional package with an Invoke (Last) component and a report error operation code**.**

This condition does not peg OMs specific to Create_Call.

19.5.5 Create_Call message with invalid CallingPartyID

When a Create_Call message contains a CallingPartyID that is not served by the SSP or is of an agent type that does not support Create_Call, this information is reported to the SCP through a failure message with FailureCause set to inappropriateUserInterface. No treatment is applied to a user, because there is no user at this time. In the case of bearer capability values not supported by AIN (for example, f7Khz, multiRate and packetModeData) an application error message with applicationErrorString encoded to ‘erronoeusDataValue’ is returned. This is consistent with the usual AIN behaviour for AIN unsupported values of bearer capability.

This condition does not peg OMs specific to Create_Call.

When the UserIdentification information is set to “DN” and the CallingPartyID is associated with an ISDN EKTS, this handling applies.

When the UserIdentificiationID is an unsupported value (that is, any value other than DN), this failure message is also returned.

19.5.6 Create_Call message with incompatible interface characteristics or user identification information

When a Create_Call message contains characteristics incompatible with the interface (that is, a bearer capability that is not supported by the CallingPartyID) or the SCP provided bearer capability is of value other than “speech” or “3.1 kHz audio”, a failure message with failureCause= inappropriateUserInterface goes to the SCP. No treatment is applied to a user, because there is no user at this time.

19.5.7 Create_Call calling party busy

When the Create_Call message is received for a valid CallingPartyID, determine if the line is busy. An analog line is considered busy when:

- The end user is Off-Hook; either involved in a call or originating a call.
- The end user is alerted to a terminating call.
- The end user is rung-back by a feature such call hold, or by an operator, attendant, 911 system, ACB or AR.
- The end user is notified of an earlier Create_Call request.
- An active feature causes the line to be considered busy

19.5.8 Create_Call with network Resource_Unavailable

When a Create_Call cannot proceed due to some network resource being available, the SCP is notified through a failure message with failureCause set to Resource_Unavailable.

19.5.9 Create_Call Message with fatal missing conditional parameter

When a Create_Call message is determined to be missing an optional, but required parameter, this information is reported to the SCP as a fatal application error with application error set to MissingConditionalParameter. No treatment is applied to a user, because there is no user at this time.

This condition does not peg OMs specific to Create_Call.

Cases of the fatal missing condition parameter include:

- the CalledPartyID contains 0 digits and the Nature of number field is set to "no address present, operator requested" and there is no Carrier parameter
- the CalledPartyID contains 0 digits and the Nature of number field is set to "no address present, Carrier Cut Through" and there is no Carrier parameter
- the CalledPartyID contains 0 digits and the Nature of number field is set to "no address present, Carrier Cut Through" and the Carrier parameter does not indicate XXXX (that is, 110 instead)

19.5.10 Create_Call when SOC AIN00271 is IDLE

When a Create_Call message is received when the SOC Option AIN0027 is IDLE, an application error with Error Cause set to UnexpectedCommunication goes to the SCP. No treatment is applied to a user, because there is no user at this time.

19.5.11 Create_Call rate too high

When too many Create_Call messages are received and the SSP cannot process all of them, the SSP returns a failure message with a failure cause set to rateTooHigh to the SCP. No treatment is applied to a user, because there is no user at this time.

This condition does not peg OMs specific to Create_Call.

19.5.12 Create_Call during ONP or restarts

Only stable calls established using Create_Call survive an ONP and restarts (warm, cold and reload). Any Create_Call messages that arrive during the blackout period of the ONP can be lost. This is consistent with the behavior of other AIN messages.

19.6 CarrierUsage error handling

The SSP does not report an erroneous data value error to the SCP when the CarrierUsage parameter received in the SCP response message has a value other than AlwaysOverride, InterLataOverride, or OverridePICsOfNOCsSent. The invalid CarrierUsage value received is ignored and the call routes using the default value of 'AlwaysOverride'.

The SSP reports an erroneous data value error to the SCP when the NatureOfCarrier parameter received in the SCP response message is out of range.

When parameter CarrierUsage is equal to AlwaysOverride and the call cannot route using the carrier selected to route the call, the call goes to final treatment.

The SSP routes the call to final treatment when parameter CarrierUsage equals InterLataOverride No carrier is provided by the SCP. The call type is InterLATA toll.

When parameter CarrierUsage is equal to OverridePICsOfNOCsSent and the NatureOfCarrier value in all CarrierId fields is NoNOCprovided, the carrier is considered to be invalid. When all SCP-provided carriers are invalid, the call routes to final treatment. The SSP reports a Fatal Erroneous data value to the SCP.

When parameter CarrierUsage is equal to OverridePICsOfNOCsSent and the carrier provided in the SCP message cannot carry the type of traffic as mentioned in the NatureOfCarrier value, the carrier is marked as invalid. When all SCP-provided carriers are invalid, the call routes to final treatment. The SSP reports a Fatal Erroneous data value to the SCP.

When parameter Carrier Usage is equal to OverridePICsOfNOCsSent and the call cannot route using the carrier selected to route the call, the call goes to final treatment.

When parameter CarrierUsage is equal to OverridePICsOfNOCsSent and the call type is local, the SSP routes the call only when field NatureOfCarrier indicates that local call is supported and the carrier is ‘0110’. For any other values of NatureOfCarrier or Carrier parameter, the call routes to treatment.

19.7 Timeout error handling

19.7.1 Race Condition Handling

When a CPH event query is sent to the SCP, all subsequent queries are queued. After the response processing of the first query is complete, the queued query is dequeued and sent to the SCP, provided that the topology has not yet changed. If the topology has changed, and the query no longer makes sense in the revised topology, the NEL associated with that query is closed with a CloseCause of “CallTerminated”.

Events in the queue are dequeued on a First-In-First-Out (FIFO) basis. Events can be queued only when armed in the same call leg.

The following describes functional behavior after queueing for the CPH event for typical scenarios.

Note: Topology refers to the way the agents are connected to each other in a call and their states at a particular point of time as seen by the SCP. This refers to the call configuration defined in Chapter 21 of GR1298, Issue6.

A -> SDS1 ->AR + O_Disconnect -> SDS2 -> AR + Timeout1 -> B. C -> SDS -> AR + Timeout2-> B(CWT)_-> B flashed.

- A calls an SDS1 number. An SDS query is hit and an AR message is received from the SCP. The AR arms an O_Disconnect event and also contains a Called_Party_ID which is set to SDS2 number. The new SDS2 number is hit and another AR message is received from the SCP, arming a Timeout event.
- The call lands on B. B answers.
- The Timeout1 Timer started.
- C dials SDS2 number. A query is launched and an AR message is received from the SCP, with the AR arming a Timeout event.
- The call lands on B. B gets CWT tone. B flashed.
- The Timeout2 Timer started.
- A disconnects. An O_Disconnect event is detected and a query is sent to the SCP. The SCP returns a Disconnect response. Before the completion of response processing for the disconnect message, the Timeout1 timer expires. As a result, the Timeout event is queued until response processing is complete for the O_Disconnect event. After the Disconnect processing is complete, the Timeout query is dequeued. Since the topology was changed by the prior Disconnect processing, making the Timeout event invalid, the dequeued timeout query is rejected and the Timeout event is closed with a CloseCause of “CallTerminated”
- When the O_Disconnect event and the Timeout2 occur simultaneously, they are not queued because they are in different call_segments.

A -> SDS1 -> AR + Timeout -> SDS2 -> AR + O_Disconnect_Called -> B -> O_Disconnect_Called EDP-R-> AR + ONoA -> C.

- A calls an SDS1 number. An SDS1 trigger is hit and a query is sent to the SCP.
- The SCP returns an Analyze_route message armed with a Timeout event and a Called_Party_ID set to SDS2 number.
- The SDS2 trigger is hit and a query is sent to the SCP.
- The SCP returns an AR message armed with an O_Disconnect_Called event and a Called_Party_ID set to B.
- The call lands on B. B answers.
- The Timeout Timer started.
- B disconnects.
- The O_Disconnect_Called EDP-R is sent to SCP. SCP returns an AR message armed with an ONoA event and a Called_Party_ID set to C

- The call lands on C.
- The Timeout expires and the Timeout EDP-R is sent to SCP. SCP returns a Continue message.
- Before completion of the Continue message processing, the ONoA timer also expires. When this occurs, the ONoA event is queued.
- After the completion of the continue response processing, the ONoA event is dequeued and sent to the SCP. The SCP returns an AR message and the call lands on D.

19.7.2 Restart and Swact Behaviour for a Timeout Requested event

The Timeout Requested event is processed normally for a stable call maintained over a warm restart. It does not remain armed over cold and reload restarts. When this occurs, the SSP notifies the SCP and the call receives dead air.

The Timeout Requested event is not detected after a SWACT/ ABORTSWACT process of switch upgrades. The call is taken active, but the event is not detected. When this occurs, the SSP does not notify the SCP the event was closed. The event remains active over an MTCSWACT.

19.7.3 T1 Timer Expiry and Unsupported/Erroneous response message handling

For a Timeout Requested Event query:

- When the Timeout EDP-R message is sent and the T1 timer expires before a response is received, the SSP sends a ReportError message to the SCP with the field ErrorCause of parameter ApplicationErrorString set to ‘ResponseMessageTimerExpired’. The call continues, NEL is closed and the call configuration remains unchanged.
- When the Timeout EDP-R message is sent and an invalid response is received from the SCP, the SSP sends an Application_Error message containing an ErrorCause parameter with a value of “UnexpectedMessage”. The call continues and the call configuration remains unchanged.
- When the Timeout EDP-R message cannot be sent because the serial trigger limit has been reached, the call is allowed to continue and the call configuration remains unchanged.
- When the Timeout event is requested as an EDP-N, the SSP detects a non-fatal “Erroneous Data Value” application error. The SSP sends a Close message without a CloseCause and the NEL is not armed.

- When the Timeout Timer cannot be started due to the unavailability of timer resources, the call continues and the call configuration remains unchanged.
- When the TimeoutTimer parameter received from the SCP is incorrect, the SSP detects a non-fatal “Erroneous Data Value” application error.

19.8 O_Disconnect and O_Disconnect_Called error handling

19.8.1 Unsupported and Erroneous response message handling

When the O_Disconnect /O_Disconnect_Called event is detected and O_Disconnect EDP-R message has been sent, if an invalid response is received from the SCP, the SSP shall send an Application_Error message containing an ErrorCause parameter with a value of “UnexpectedMessage”. AINF treatment will be applied to the AIN Controller. When the current Call Configuration is a stable two-party call (CC2), then the resulting CC will be CC0. In all other Call Configurations involving more than one call leg (CC4 to CC11), only the AIN Controller will be disconnected and will let the normal switch feature processing to control the disposition of the call.

19.8.2 Call handling, Post-Query Message Monitoring and Error handling

When the O_Disconnect / O_Disconnect_Called event is detected and O_Disconnect EDP-R query message has been sent, and the T1 timer expires before a response is received, then the SSP will send a ReportError message to the SCP with the field ErrorCause of parameter ApplicationErrorString set to ‘ResponseMessageTimerExpired’. AINF treatment will be applied to the AIN Controller. When the current Call Configuration is a Stable two-party call (CC2), then the resulting CC will be CC0. In all other Call Configurations involving more than one call leg (CC4 to CC11), only the AIN Controller will be disconnected and will let the normal switch feature processing to control the disposition of the call.

When the O_Disconnect or O_Disconnect_Called event is detected and an O_Disconnect EDP-R message cannot be sent due to the serial trigger limit being reached, AINF treatment will be applied to the AIN Controller. When the current Call Configuration is a Stable two-party call (CC2), then the resulting CC will be CC0. In all other Call Configurations involving more than one call leg (CC4 to CC11), only the AIN Controller will be disconnected and will let the normal switch feature processing to control the disposition of the call.

When the O_Disconnect event is requested as an EDP-N, the SSP will detect a non-fatal “Erroneous Data Value” application error. The SSP will send a Close message without a CloseCause and the NEL is not armed.

O_Disconnect or O_Disconnect_Called event can be detected only for up to 24 hours after it has been armed.

19.8.3 Restart and Swact Behaviour for O_Disconnect_Called and O_Disconnect event

O_Disconnect and O_Disconnect_Called events will not be detected after a reload or cold restarts. O_Disconnect and O_Disconnect_Called events are closed after reload or cold restarts.

O_Disconnect and O_Disconnect_Called events will be detected after warm restarts.

O_Disconnect and O_Disconnect_Called events will not be detected after a SWACT or ABORTSWACT process of switch upgrade. The Close message is not sent to the SCP. The call will not be affected. The speech path will remain active.

O_Disconnect and O_Disconnect_Called events will be detected after a MTC SWACT. The call will not be affected. The speech path will remain active.

19.9 Connect_To_Resource error handling

19.9.1 Connect_To_Resource error cases

When a CTR message is received from the SCP that is invalid because the call is in a wrong CC, or CTR was received at wrong PIC, then a error message is sent to the SCP with ErrorCause “UnexpectedMessage”. If there is only one agent in the call when CTR is received (CTR received in CC1) then AINF treatment is provided to that agent.

When a mandatory parameter, like ResourceType or StrParameterBlock, is missing in a CTR message, then an error message with ErrorCause “fatal missing conditional parameter” is sent to the SCP. The processing of the call is not affected by this CTR message.

When the SSP receives a CTR message with a destination address parameter, then the message is not processed. An error message with ErrorCause “unexpectedCommunication” is sent to the SCP. The processing of the call is not affected by this CTR message.

When a CTR message is received with a LegId that is not valid, or corresponds to agent which is not active in the call, then an error message is sent with ErrorCause “invalidLeg”. If the LegId corresponds to an agent who is not active in the call, then the call is taken down after sending the error message to the SCP. If the LegId value is out of range then the processing of the call is not affected by this message.

When the Disconnect parameter is absent in a CTR message received in a response package, then an error message is sent to SCP with ErrorCause “erroneousDataValue”. The processing of the call is not affected by this CTR message. As this error message is sent in an Unidirectional package, the

Transaction Id is not closed. The SCP can handle this call either by sending a CTR message with Disconnect parameter or by sending a different message.

When a CTR message is received in a Conversation package and a Disconnect parameter is present, then an application error message is sent in a response package with ErrorCause “erroneousDataValue”. The processing of the call is not affected by this message.

On receiving a CTR message (for external resource), if the route to the IP is unavailable (busy), then CTR_Clear message is sent in conversation package with ClearCause “ChannelsBusy”.

On receiving a CTR message (for external resource), if the IP is unavailable (busy), or a hardware problem exists, then CTR_Clear message is sent in conversation package with ClearCause “abort”.

When parameters that are not supported are present in the CTR message, then these parameters are ignored and the CTR message is processed.

19.9.2 Play Announcement and Collect Digits error cases

When a CTR message is received, and the ResourceType is neither playAnnouncementAndCollectDigits nor playAnnouncement, then an error message is sent to the SCP with ErrorCause “erroneousDataValue”. The processing of the call is not affected by this CTR message.

When a CTR message is received in response package with ResourceType set to playAnnouncementAndCollectDigits, then an error message with ErrorCause “unexpectedCommunication” is sent to the SCP. The processing of the call is not affected by this CTR message.

When a CTR message is received in conversation package with ResourceType playAnnouncement, then this message will be treated as non-fatal unexpected communication error and the CTR message is treated as if received in Response package.

When a CTR message is received without a maximumDigits parameter in the AnnouncementDigitBlock, then an error message is sent to the SCP with ErrorCause “erroneousDataValue”. The Processing of the call is not affected by this CTR message.

When a CTR message is received with an Invalid announcement id Error message (invoke last report error), then an Error message is sent to the SCP with ErrorCause “erroneousDataValue”. The processing of the call is not affected by this CTR message. As the TransactionID is not closed, the SCP could handle the call by resending the CTR message with Announcement block or by sending a different message.

When a CTR message is received without an announcement id in the Announcement block, then an error message is sent to the SCP with ErrorCause “erroneousDataValue”. The processing of the call is not affected by this CTR message. As the TransactionID is not closed, the SCP could handle the call by resending the CTR message with Announcement block or by sending a different message.

When a CTR message is received with User-interruptible announcement in response package, then an Error message is sent to the SCP with ErrorCause “erroneousDataValue”. The processing of the call is not affected by this CTR message. As the TransactionID is not closed, the SCP could handle the call by resending the CTR message with Non-User-interruptible Announcement or by sending a different message.

When a CTR message is received in a conversation package and maximumDigits is encoded 0, then after playing the announcement, a CTR_Clear message is sent with ClearCause set to “normal” and CollectedDigits as “notApplicable even unknownOrNotApplicable”. As this CTR message is received in conversation package, the CC after CTR message processing remains unchanged. The SCP then sends a response to this CTR_Clear.

When an Announcement resource specified by the CTR message is busy, then a CTR_Clear message is sent. The ClearCause parameter is set to “failure” and FailureCause is set to “unavailableresource”. The processing of the call is not affected by this CTR message. The TransactionID is not closed as the CTR_Clear message is sent in conversation package. The SCP could handle the call by resenting the CTR message with a different Announcement ID or by sending a different message.

When the Agent doesn’t enter digits after the announcement and Interdigit timer expires, then CTR_Clear message in conversation package with ClearCause “invalidCode”. The response sent to this CTR_Clear by the SCP will processed.

19.9.3 CTR_Clear message error cases

On receiving a CTR message in conversation package with maximumDigits set to 253 (Normal number of digits), if the user dials digits which do not confirm to the dialling plan in force, then CTR_Clear message is sent in conversation package with the digits collected and ClearCause “invalidCode”. The response sent to this CTR_Clear by the SCP will processed.

When the T1 timer expires before the SCP sends a response to a CTR_Clear message, then an Application error message is sent to SCP with ErrorCause “responseMessageTimerExpired”. The processing of the call is not affected by this message.

19.9.4 Restart and Swact Behavior for Connect_To_Resource

After a SWACT/ ABORTSWACT process of switch upgrades, the call will be taken down.

Table 174 Restart Behavior for CTR

Restart Type	Conversation Package	Response Package
Warm	The announcement completes, but no digit collection done. The user is hung in CPB state. User can be released by going onhook after the restart is over.	The announcement completes. The user is hung in CPB state. User can be released by going onhook after the restart is over.
Cold	The announcement completes, but no digit collection done. The call is taken down.	The announcement completes. The call is taken down.
Reload	The call is taken down	The call is taken down

19.10 Office parameter Limitations and Restrictions

Following are the limitations that can be encountered even though the AIN_MAX_SERIAL_TRIGGERS limit is set to a higher value in table OFCENG.

- DMS Software resources
- Interaction with Call forwarding scenarios
- Maximum number of Virtual agents
- Maximum Number of Timers

19.10.1 DMS software resource

HCBs, HDBs, FCBs, FDBs, Transaction id pools etc. are the software resources in DMS. These resources are controlled by Office Wide Engineering Control. Each trigger will use some of these resources. In traffic scenarios involving AIN calls, these software resource limit could be encountered and the call is provided NOSR treatment. These resources are provisionable in table OFCENG. Please refer to the Section 35.1 EI section in AIN SIG.

Note: These resource limitations are applicable on an office wide basis, not on a per call basis.

19.10.2 Interaction with call forwarding scenarios

In DMS, the maximum number of redirections (forward_call and switch based call forwarding) is limited as 5. Hence if the a call encounters 5 redirections, and if another redirection is encountered as a result of a forward_call or a switch based call forward (CFU, CFW etc.), then the call is routed to treatment.

19.10.3 Maximum number of virtual agents

In DMS, an entity called Virtual agent is created for storing the characteristics of agents involved in a call. This is done so that not to loose the information on those agents. The Virtual agents are created in a call during the following scenarios.

- Encountering a terminating trigger (TAT, TBUSY, TNOA etc.)
- Arming NELs (one Virtual agent per NEL)
- Redirections due to VFG, DISA, LARP etc.
- Switch based call forwarding (CFB,CFU etc.)

Hence a resource (virtual agent) is consumed for each of the above scenarios happen in a call. In DMS, the number of Virtual agents in a call is limited to 26.

If the call exceeds this limit as a result of a complex scenario (with number of redirections, triggers and arming NELs), the call will route in to AINF treatment. This will be pegged in the OM AUGPEXH (In OMGROUP AIN). If the maximum limit is encountered as a result of arming a NEL, then that NEL will be closed and the call will proceed further.

Hence this should be taken care while designing the complex services to the end users.

19.10.4 Maximum number of timers

In AIN, the timers are associated with ONOA and TNOA (both triggers and events). DMS supports 8 timers to run at the same time. Hence if a call arms 8 ONOA or TNOA NELs with 8 different timer values at an instance of a call and if one more NEL is armed with a different timer value then the oldest timer will be closed along with the event (ONOA or TNOA) and the new event (with new timer) will be armed. Hence in such scenarios, certain NELs cannot be detected due to the timer resource limit.

If same timer value is used for arming different events (ONOA or TNOA), then no timer limitation will encounter, as the same timer is used.

20 Limitations

20.1 Overview

This chapter describes the restrictions and limitations of the product. The restrictions and limitations are those affecting external components, systems, or users that interact with the AIN Service Enablers SSP product.

For details about product characteristics and behavior, see the related description chapter in Chapter 5: “Functional overview” on page 159.

20.2 Hardware limitations

See Section 5.2 “Hardware limitations” on page 283.

20.3 Messaging and parameter limitations

This section describes the limitations associated with various messages and their parameters.

For details about message and parameter characteristics and behavior, see Chapter 6: “Generic SSP procedures” on page 173 and Chapter 10: “Information revision messages” on page 297.

20.3.1 General

The following is a general messaging limitation: parameter UserID for ISDN triggering agents is set to the DN of the agent.

20.3.2 Send/Termination notification messages

When a caller abandons during an open transaction, the SSP sends a Termination_Notification message as a reply to the last Send_Notification message received in the open transaction.

On rare occasions, a response or conversation message destined for the same transaction can arrive after the caller abandons. When this response or conversation message contains a Send_Notification component, the SSP replies again with a Termination_Notification message, creating a scenario where two Termination_Notification messages are sent out to the SCP for one call.

When the SSP receives a Send_Notification message with the Disconnect message, the SSP sends an application error message to the SCP without a Termination_Notification message.

20.3.3 Update message

The Update message has the following limitations

- The maximum number of Update messages that can be pending at an SSP is 7.
- The SSP can process up to 7 Update messages per second.
- During an ONP, changes to the T_ONoAnswer timer by an Update message are not propagated when the message is received after the final "Pre-SWACT" interval of the ONP. The "Pre-SWACT" interval lasts about 30 minutes. During this interval, the Update_Success message continues to be sent to the SCP. However, the data is not propagated.
- During an ONP (lasting about 8 hours), changes to the value of the T_ONoAnswer timer specified by an Update message are not propagated.
- During an ONP, only the first 4500 Update messages for activation or deactivation of triggers are allowed. When any additional messages for activation or deactivation of triggers are received, the SSP sends unavailable resource messages to the SCP until the ONP completes.
- Update messages that are pending are lost during warm, cold or reload restarts.
- Both T-ONoAnswer timer update and T-TNoAnswer timer update requests cannot come at the same instant
- The Update message cannot update the activation state of a trigger assigned to a particular PRIB channel
- The Update message cannot update the activation state of a trigger assigned to a particular customer group
- Update message does not support Spid and PublicDialingPlanID values in the SSPUserResourceID field of parameter TriggerItemAssignment
- The Update message does not allow activation or deactivation of the triggers assigned to PRI-B channels and Customer groups (Bellcore Specification limitation)

20.3.4 Collect_Information message

The following limitations apply to Collect_Information message processing:

- for POTS agents only, one dial plan element is supported in CollectedDigits
- a limited subset of vertical service code features are supported as detailed in Section 6.6.2.7 "Vertical service activation with Collect_Information" on page 251.

- When the originator is an AttendantConsole and Collect_Information is received, the call shall be provided AIN Final treatment (AINF)
- When the Collect_Information message is received in reply to the ONoAnswer message on a Three Way Call after the conference has been bridged (all parties that hear ringing are in a conference together and hear ringing), the call is sent to NACK (feature activation negative acknowledgment) treatment

20.3.5 Create_Call message

The following limitations apply to Create_Call message processing:

- The RRBCME message is not processed when it accompanies the Create_Call message.
- No support for User ID info="ISDN Info" or "ADSI CPE ID" is provided. DN is the only supported value for the user identification ID.
- Controlling Leg Treatment values of "on-hook TR-30 with wake-up indication" and "on-hook TR-30 without wake-up indication" are not supported.
- ADSI Service as specified by User ID info= "ADSI CPE ID" is not supported, however an ADSI terminal is supported as an Analog line agent

20.3.6 Parameter AccessCode

Parameter AccessCode is not supported for the following functionality:

- Attendant access code
- AIN 0.1 Switching Systems Generic Requirements feature access code because there is no requirement in TA-NWT-001284, Issue 1, January 1992, except for an SCP-defined feature access code
- any access code not detailed in Section 6.4.4.19.1 “AccessCode parameter” on page 194

According to TA-NWT-001284, *AIN 0.1 Switching Systems Generic Requirements*, Issue 1, January 1992, requirement (R) 2.6-30 indicates that any access code escaping to the public office dial plan should not be populated in the Info_Collected query to the off-board processor. Therefore, ‘POTS escape codes’ are not populated in parameter AccessCode in the query.

20.3.7 Parameter CalledPartyID

TA-NWT-001285 specifies to populate the contents based on the description in TR-NWT-000317, TR-NWT-000394, and TR-NWT-000444. TA-NWT-001284 contradicts existing TRs when describing how to populate this parameter. This is an open issue with Bellcore. The DMS SSP follows the population guidelines specified in existing TRs.

The DMS SSP does not support the value of "Test Line Test Code" for the "Nature of Number" field because there is no present means of triggering in this situation.

The nature of address code in the ISUP IAM for 950-XXXX calls is "subscriber number", except when the 950-XXXX digits are received from a public station or a hotel/motel line, in which case the nature of address code is "950+ call from local exchange carrier public station or hotel/motel line or non-EAEO".

For terminating triggers, field Nature of Number of parameter CalledPartyID in the query is always populated as SubscriberNumber.

20.3.8 Parameter CalledPartyStationType

See Section 20.3.11 "Parameter ChargePartyStationType" on page 641.

20.3.9 Parameter CallingPartyBGID

The Business Group ID field in parameter CallingPartyBGID is set to the Business Group identifier of the triggering agent.

The Subgroup-ID subfield of parameter CallingPartyBGID is always set to "No Indication" for SS7 originating trunk facilities. When a value other than "No Indication" is returned by the SCP, it is outpulsed in the IAM, but it is not used within the DMS SSP.

Parameter CallingPartyBGID is not used in any re-translation that is done based on other components of the Analyze_Route message.

Parameter CallingPartyBGID does not affect feature activation or restriction on intraswitch calls.

When a value of "Interworking with Private Networks" is returned by the SCP for the BGID tp subfield, it is outpulsed in the IAM, but it is not used within the DMS SSP pending clarification of requirements from Bellcore.

When a CallingPartyBGID party selector of "Redirecting Number" is returned by the SCP, parameter CallingPartyBGID is not outpulsed in the IAM.

The restrictions and limitations associated with non-AIN based MBG also apply to SCP based MBG. These limitations, which are detailed in *Meridian Digital Centrex Translations Guide*, Volume. 5, NTP 295-2001-351, are not specific to AIN.

20.3.10 Parameter CallingPartyID

The Screening Indicator field of parameter CallingPartyID for all line triggering agents is always set to "network provided."

20.3.11 Parameter ChargePartyStationType

Parameter ChargePartyStationType is supported with the following restrictions:

- The appropriate DMS packages must be available (for example: interLataRestHotel is only supported when the customer's office is an equal access end office.
- Only values supported by the DMS MF and ISUP protocols are supported for ISUP and MF trunks as appropriate.
- The "ain01" value is not supported for originating line facilities because TA-NWT-001284, *AIN 0.1 Switching Systems Generic Requirements*, Issue 1, January 1992 does not describe when to use "ain01" for populating the parameter.
- any situation not detailed in Section 6.4.4.19.15 "ChargePartyStationType parameter" on page 206.

20.3.12 Parameter CarrierUsage

Parameter CarrierUsage processing does not support the routing of equal access calls over private trunks after receiving a message containing parameter CarrierUsage.

20.3.13 Parameter CollectedAddressInfo

Restrictions and limitations are identical to those already expressed in Section 20.3.7 "Parameter CalledPartyID" on page 639.

In the IBN pre-processing stage of the incoming side of ISUP and MF VAPN trunk, the country code is stripped off before triggers OHD or CDP AC are encountered. Because of this, the country code is not populated in parameter CollectedAddressInfo for international calls through MF and ISUP VAPN trunks triggering at OHD and CDP AC triggers.

20.3.14 Parameter DisplayText

Parameter DisplayText is supported with the following restrictions and limitations:

- For all other agents not mentioned in Table 101 "AIN DisplayText field support for specific line types" on page 285, DisplayText information is ignored.
- Terminating MDC agents with DisplayText functionality can obtain the calling name, number, dateTimeOfDay (IBN only) information from the AIN SCP. The called name, number and redirecting name or number (when present in the reason display at the terminating party) can be obtained from the local database.
- The maximum number of characters in the callingPartyName field is 15. When the SCP sends more than 15 characters in callingPartyName field,

the SSP truncates it to 15 characters and send it to the called party's CPE. Note that for some ISDN BRI terminals that use Protocol Variant Control Functional 1 (PVC1), sending more than 15 characters may result in nothing being displayed on it.

- The maximum number of characters in the callingAddress field is 10. When the SSP receives more than 10 characters in the CallingAddress field, the SSP truncates it to 10 and sends it to the called party's CPE.
- Fields skip, blank, text, featureAddress, RedirectingReason and originalCalledName in the parameter DisplayText are not supported.
- The dateTimeOfDay field in parameter DisplayText is not supported for MBS or EBS lines.
- For terminating EBS/MBS/ISDN-MFT agents, when an Authorize_Termination or Offer_Call message containing parameter DisplayText is received [and the call waiting (CWT) feature is encountered], the CWT subscriber uses the INSPECT key to display the name and number of the CWT call. The calling party's name and/or number provided by parameter DisplayText is not displayed on the customer premises equipment (CPE), instead it displays switch based information when it is available.
- When an AIN call encounters and one of the following scenarios occurs, only the callingAddress information from AIN display text is displayed on the ISDN BRI NI1/NI2 set
  - — the parked call is retrieved from an ISDN BRI NI1/NI2 terminal that parked the call,
  - — the call park recall occurs
  - — the executive busy override (EBO) barge-in party drops from the call
- On blind transfer calls to RES sets in which recall occurs to a set that had received AIN DisplayText, AIN DisplayText is restored. It is not restored for any other set types.
- AIN DisplayText does not appear during ringing on non-primary keys of a KSET phone unless AUTODISP is being used. The DisplayText always appears once the call is answered.
- A call restored from MADN hold to an ISDN set does not have the CallingParyName AIN DisplayText information restored.
- Calls originated or extended from an attendant console cannot display AIN DisplayText information. The attendant console name is displayed.
- AIN DisplayText is not supported for queued MADN MCA calls to IBN sets

20.3.15 Parameter DPConverter

Parameter DPConverter is supported with the following limitations and restrictions:

- The DPConverter parameter received in the Update, Connect_To_Resource, and Originate_Call Messages is not supported.
- DP-to-DTMF conversion is not supported for ISDN and KSET line agents. See Table 173 for more details.

Table 173 Originating Agents not supporting DPConverter parameter

Agent Type	Line Class Code
IBN - Basic	M5009
	M5112
	M5208
	M5209
	M5212
	M5312
	PSET
	M5009
ISDN	ISDNKSET - MTF
	ISDNKSET - BRI - NI1 / NI2

20.3.16 Parameter ExtendedRinging

Parameter ExtendedRinging is supported with the following limitations and restrictions:

- The Extended Ringing capability is supported for the AIN O_NoA and AIN T_NoA trigger and events. No other triggers or events are supported.
- The Extended Ringing capability is not supported when interacting with conferencing features (for example, 3WC).
- The Extended Ringing capability continues the limitation found with the AIN Extended Ringing (Internal STR) feature with Call Forward features: forexample,, for O_NoA, all call forwarding is completed before the STR message is processed with the AIN ExtendedRinging parameter. For T_NoA, whichever timer expires first (T_NoA or CFDA), that feature will be processed, the other feature will be cleaned up.
- The Extended Ringing capability is noncompliant with the requirement in GR-[1061] and GR-[1072] that a Cancel_Resource message should be sent towards IP to take down the IP connection.

20.3.17 Parameter ForwardCallIndicator

Parameter AIN ForwardCallIndicator is fully supported.

ISUP does not enforce the value of "ISDN User Part Required All The Way" in the ISDN User Part Preference field of parameter SS7 ForwardCallIndicator. As with base ISUP, a call can complete over an MF trunk when no ISUP trunks are available and the SCP returns "ISDN User Part Required All The Way" for parameter AIN ForwardCallIndicator.

20.3.18 Parameter GenericAddressList

The current implementation of parameter GenericAddressList does not comply with ISDN requirements for this parameter. It is not populated for ISDN originating facilities.

For parameter GenericAddressList, the following generic address types can be set only when they are received as part of a Generic Address List response:

- supplemental user provided calling address (failed screening)
- supplemental user provided calling address (not screened)
- Ported Number
- 800 Service Indicator

The current implementation of parameter GenericAddressList does not comply with the requirement that the SCP response overwrites the SSP parameters in the following multi-switch scenario. For intermediate or terminating SSPs, a multi-location business group (MBG) call does not allow the SCP to overwrite the MBG's Dialed_Number GenericAddress parameter. During outpulsing of an IAM message, the AIN Dialed_Number GenericAddress parameter is suppressed when the MBG GenericAddress exists and the MBG version is outpulsed.

20.3.19 Parameter NetworkSpecificFacilities

Only two variants of PRI are supported: NTNA PRI and NI PRI. PRI variants U449PRI and U459PRI are not supported.

The ICAN service type is not supported for NI PRI because it does not support ICAN on the DMS SSP. Similarly, ICAN, Hotel/Motel and SCOCS service selections are not supported for NTNA PRI because it does not support these service types on the DMS SSP.

The maximum length of service parameters supported is four IA5 characters.

Parameter NetworkSpecificFacility received in an AIN response is outpulsed with the outgoing PRI SETUP message only for call-by-call calls.

20.3.20 Parameter PrimaryCarrier

Parameter PrimaryCarrier is not supported for the following functionality:

- non-equal access end offices (the PIC is only available when the customer has equal access software)
- primary carrier is only populated in the Resource_Clear message when the carrier access code is dialed
- parameter PrimaryCarrier is populated as LEC when the call is operator assisted
- parameter PrimaryCarrier is not populated after a Forward_Call response when the forwarding agent is a virtual DN
- parameter PrimaryCarrier is not populated for an equal access tandem office in Send_To_Resource normal digit collection

20.3.21 Parameters RedirectingPartyID and RedirectionInformation

AIN Service Enablers does not support the case where a returned redirection counter value in parameter RedirectionInformation from the SCP is less than the redirection count sent in the AIN query. When the returned value is less than the query value, the query value increments by one and is used in subsequent signaling.

AIN redirection data is not propagated to a terminating BRI interface. Consequently, the AIN redirecting number is not displayed on the terminating BRI set.

When parameter RedirectionInformation is returned in an Analyze_Route message but parameter RedirectingPartyID is not present in that message, parameter RedirectionInformation is discarded and normal call processing continues.

When the SCP does not cause the first redirection, the returned original redirecting reason value in parameter RedirectionInformation cannot overwrite the existing original redirecting reason.

When more than one redirection occurs on a call terminating to NTNA PRI, U449PRI or U459PRI, only the original redirecting party, original redirecting reason, and redirection count are included in the outgoing SETUP message. Last redirecting number and reason are not supported. This restriction applies to NTNA PRI,U449PRI and U459PRI only.

20.3.22 Parameter TCM

Parameter TCM is supported with the following restrictions:

- parameter TCM is not built as part of the Termination_Attempt query message
- when the originating access is an SS7 trunk and the received IAM contains parameter generic digits with the type of digits specified as “private network travelling class mark”, the TCM parameter is not populated
- any situation not detailed in Section 6.4.4.19.25 “OriginalCalledPartyID, RedirectingPartyID, and RedirectionInformation parameters” on page 214
- TCM events cannot be armed when terminating to an attendant console

20.3.23 Parameter TerminationIndicator

The BusyCause indication in parameter TerminationIndicator is not populated for ISUP calls that do not generate a SS7 release message because the treatment procedure selector at the terminating office for the call is LOCAL. An Exception indication is set for any incomplete calls.

The BusyCause indication is not populated for calls that successfully route over PRI or PTS trunks. In this case, any unanswered call (for any reason) results in an Exception indication.

When a ringing time-out condition occurs on the same switch as the Send Notification is received, the BusyCause indication is set rather than the Exception indication. The BusyCause is populated as “User Busy”.

20.3.24 Parameter UserID

Parameter UserID for ISDN triggering agents is set to the DN of the agent.

For VFG triggering agents, parameter UserID contains the identity of the originating facility, not the billing number of the VFG. When triggering occurs after a Forward_Call response or after encountering a switch-based call forwarding feature, the UserID parameter contains the identity of the last forwarding station.

The DMS SSP does not support the following values for query population:

- [2] IMPLICIT SEQUENCE {IsdnInterfaceID, Spid, DN} -- BRI (ISDN1)
- [4] IMPLICIT CallingPartyBGID
- [3] IMPLICIT IsdnInterfaceID -- PRI (ISDNII)
- [7] IMPLICIT Mlhg
- [8] IMPLICIT RouteIndex
- [9] IMPLICIT PrimaryTrunkGroup

20.4 Limitations for Send_To_Resource using an IP

The Send_To_Resource function has the following limitations:

- Retriggering at the local SSP or at the intermediate SSPs, while establishing the STR-connection, is not supported.
- The InvokeID is set to “one” in all messages from the SSP to the IP.
- For the STR requests processed using the resources on the SSP, multiple announcement IDs are not supported.
- Multiple FIEs in a DISC, REL COM, or FACILITY message are not supported.
- When the DestinationAddress translates to a Number Service Code (NSC) selector (for example, a freephone number [800 or 888]), the SSP sends a resourceClear message with ClearCause=abort.
- Parameter DestinationAddress can not route to a VFG or agents other than ISUP or PRI (which are the only agents that can convey the information in the STR message to the IP). When it does, the STR request is denied and a resourceClear message with ClearCause=abort is sent back to the SCP in a conversation package.
- Equal access is not supported in translating the 10-digit DestinationAddress which is in the national number format. When the caller has a pre-subscribed equal access carrier, this is not taken into consideration. When a carrier is required to establish the STR-connection to the IP, the SSP denies the STR request and sends a Resource_Clear message with ClearCause=abort to the SCP.
- When the caller abandons while interacting with the IP, digits that can be collected by the IP are not reported to the SCP. The Resource_Clear message only contains parameter ClearCause set to “UserAbandon”.
- The size of the IPReturnBlock, encoded using ASN.1, that can be passed from the IP to the SSP in the FIE in a FACILITY message is limited to 92 bytes.
- When a SendToResource message containing parameter AMAMeasure with a value of ConnTimeRecordDestinationSCP is received from the SCP, the connection with an IP is made, and the CallInfoFromResource message is subsequently sent out from the SSP to the SCP. When the caller abandons after the CallInfoFromResource message has been sent to the SCP and before the CallInfoToResource message has been received from the SCP, then a ResourceClear message is sent to the SCP without parameter AMAMeasurement. When the caller abandons at any other point in this call scenario, parameter AMAMeasurement is included in the ResourceClear message.

For details about STR characteristics and behavior, see Chapter 11: "Participant interactions" on page 455 to Chapter 16: "STR connection to a remote IP" on page 547.

20.5 STR processing with SSP resource

If Send_To_Response is the response returned for any of the valid triggers encountered on a SIPT trunk, then a DPT Media Anchor or Anchor Packet Gateway is required to support this scenario. ISUP loop-around trunks cannot be used in place of an APG/Media Anchor in thes scenario.

20.6 Toll-free service limitations

AIN Service Enablers' toll-free service does not implement the following requirements:

- 10 digit segregation. This is an optional requirement.
- 30-second EADAS discrete indicating that calls were blocked in the last 30-second clock interval and 5-minute EADAS indicating the total number of toll-free call attempts and the number blocked by SCVP and SMS AGC controls
- Three OMs specified in GR2892 are unsupported: Return Error or Reject Component, Announcement Number Unavailable and Abandon After Outpulsing
- Bellcore specifications indicate that When the overflowing control arrived in a package that also contained a Send_Notification message an indication of the overflow is included in the subsequent Termination_Notification. This requirement is not supported. However a unidirectional ACG overflow message is sent.
- The following agents are not supported: 8FR/10FR and lines with trunk treatment (SS7 Type 1 cellular trunks).
- Since toll-free codes are considered out-of-band for WATS, toll-free calls cannot originate from WATS lines. This is equivalent behavior to TR-533.
- AIN Service Enablers toll-free calls originating on TOPS trunks are routed to the operator for call number identification when ANI is not received on calls using three-stage FGD signaling. ANI failure or ONI can cause this. AIN Service Enablers toll-free calls originating on TOPS trunks and using FGC signaling or two-stage FGD signaling bypass the operator.

For details about AIN Service Enablers toll-free service characteristics and behavior, see Chapter 18: "Toll-free service" on page 597.

20.7 Attendant console limitations

Unless specifically stated otherwise, any DMS-based feature that does not presently support interaction with the Attendant Console continues unsupported even when an AIN interaction occurs before the switch-based

feature, and even when the AIN response changes the characteristics of the call.

Attendant console support for triggers SDS, N11, and Encounter TAT supports an STR response of play announcement with internal switch resources only. STR requests in a conversation package, including all digit collection requests, are not supported. Connection to an external resource (IP) is not supported. These calls are sent to final treatment (AINF).

When the attendant console encounters a TAT trigger, the Attendant Camp On feature is disabled.

The O_No_Answer event is not detected for calls that terminate on an attendant console. See Section 8.7.1 on page 372 for the O_Called_Party_busy event interaction when terminating to an attendant console.

When a call arming multiple OCM NELs terminates on an AC, and when the AC answers, events other than O_Answer are not detected and are closed with Close_Cause set to CalledPartyAnswered.

When a call arming multiple OCM NELs terminates on an AC Night Service, all the armed events are closed immediately with Close_Cause set to EDPs_Completed.

When the attendant console originates a call to VFG which subsequently queries AIN, then the Userid and CallingPartyID parameters in the TCAP query message are set to the VFG ChargeNumber instead of the originator's ChargeNumber. This limitation does not affect billing.

Armed TCM NELs are closed when the attendant console releases on attendant console extended calls.

When the attendant console encounters triggers SDS, N11 or TAT, call processing disarms the DND override feature.

Because the attendant console and the anonymous caller rejection (ACRJ) feature are not compatible, the attendant console cannot encounter this feature and receive ACRJ treatment.

Calls originated or extended from an attendant console cannot display AIN DisplayText information. The attendant console name is displayed.

20.8 ACG limitations

Bellcore specifications indicate that when the overflowing control arrived in a package that also contained a Send_Notification message then an indication of the overflow is included in the Termination_Notification. This requirement is

not supported. However, the SCP is informed of ACG overflow conditions by the ACG_Overflow message sent by the SSP to the SCP and by the fact that the next SSP query associated with the target control does not contain parameter ACG_Encountered.

Control exclusion is permitted on SMS initiated controls only. An SCP gap interval of "0" is treated as a fatal application error. This type of error does not affect the processing of the call related components of the package when the ACG component was received as part of a multi-component package.

EADAS requirements for ACG are not supported in this release.

For details about ACG characteristics and behavior, see Chapter 8: "Network management" on page 271.

20.9 AIN: Connect_To_Resource (CTR) limitations

This functionality has the following limitations:

- This activity supports CTR message received in response to Timeout, O_Disconnect and O_Disconnect_Called queries only.
- Agents connected to the resource cannot invoke any switch-based feature.
- In a three-way call scenario where the calling party of the first leg (A) is an AIN/CPH controller, the called party of first leg (B) is a 3-way call controller, and C is the called party of the second leg, B and C remain connected, but cannot listen to A while CTR processing is taking place on A.
- The CTR announcement is not played to multiple parties in a call segment. This is a limitation with respect to the GR requirements.
- For O_Disconnect Event CTR is supported only in Response Package.

20.10 AIN: GLP Parm in TAT trigger limitations

This functionality has the following limitations:

The CGLP and the GDLP are not sent in the TDP-R query under the following conditions:

- The parameters are not received in the incoming IAM message for ISUP.
- The call was setup with signalling other than SS7, (e.g. ISDN Call Setup message, PTS), and parameters are not received in the incoming signalling.
- This feature does not support wire line emergency calls.
- This feature does not support location based services for non-emergency calls when the CGL and the GDL parameters are not received in the incoming IAM message.

- New parameters are not supported in the Info_Collected messages, because Dedicated_Trunk_Group trigger is not supported.
- Triggers based on specific trunk type are not supported.

20.11 AIN: O_Disconnect and O_Disconnect_Called Event limitations

This functionality has the following limitations:

- No support for calls involving more than three agents
- Call hold and call transfer features are not supported.
- Population of these parameters is not supported:
  - Originate_Call
  - Split_Leg
  - Move_Leg
  - Merge_Call
  - Reconnect
  - Disconnect_Leg
  - Acknowledge
  - Authorize_Termination
  - Offer_Call
- Population of the following parameters is not supported on the O_Disconnect Event query message sent by the SSP:
  - Amp1
  - Amp2
  - ExtensionParameter
- The switch based feature controller and the AIN controller cannot be the same agent unless the switch based feature is CWT or one of its variations (CWI, CWC, CWO, TCW, CWD).

  Note: The AIN controller is the agent originating the call that armed the O_Disconnect/O_Disconnect_Called event.

- When a call-leg is receiving AIND or AINF treatment, all feature requests by any party on that call-leg are denied during the time the treatment is being applied.
- CPH events can be armed only in one leg of the CHD call.
- In conference circumstances, when the AIND treatment is provided to an agent, the agent is taken down and the AIND log is generated. The remaining parties are re-configured according to feature behavior.

- When a particular call leg is receiving AIND or AINF treatment, all feature requests by any parties on that leg will be denied during the window when the treatment is being given.
- CPH events can be armed only in one leg of the CHD call.

20.12 AIN: Office Public Feature Code (OFCPFC) trigger limitations

Although the Office_Public_Feature_Code trigger is an office wide trigger, only RES and ISDN BRI agents encounter the trigger. While provisioning trigger OFCPFC on an Office, all the agents within that office are subscribed without any warning or errors. Checking for an agent is done only during run time (CallP) and only the RES and ISDN BRI agents trigger.

The OFCPFC trigger subscribed on an office does not support a Continue response. When a continue response is received, the call is routed to AINF treatment.

The AINDENY option denies a maximum of 15 trigger item IDs when used to deny triggers on a line.

20.13 AIN: Scope Change Tool limitations

This functionality has the following limitations:

- Convert sub-command does not add AINDENY, and prints a warning message when the following conditions are satisfied:
  - An agent belongs to the associated customer group.
  - The agent has no individual subscription to the PFC or SFC trigger entered.
  - The agent has maximum number of subscribed AINDENYs.
- The AINSCT tool does not have a provision to undo the changes incurred due to use of this tool. Any changes required must be done manually.
- If the AINGRP entered in the CONVERT sub-command is associated with the PFC, SFC and CDPCODE triggers, only the PFC or SFC trigger is added to the RES GROUP. The CDPCODE trigger is not provisioned to the RES GROUP because it is not compatible with RES group.
- Duplicate entries can be created in table TRIGITM during execution of the CONVERT command in the TRIGGRP data model . This occurs if the CONVERT command is executed for the same TRIGGRP or TRIGDIG entries in two different sessions of the AINSCT tool. This can be avoided by executing the CONVERT command in the above scenario in the same AINSCT session.

An example of the scenario in which the duplicate tuples can be created:

1. CONVERT PFC_TRAFFIC REGS613

   This command will create following tuple in the table TRIGITM

   4 pfcb98 pfc dg b98 $ ulk event r02 ss7 ainpop $

   33 onoa1 onoa $ ulk event r02 ss7 ainpop $

2. AINSCT tool is exited.
3. AINSCT tool is re-entered.
4. CONVERT PFC_TRAFFIC RESG416

   This command will create following tuple in the table TRIGITM

   4 fcbb98 pfc dg b98 $ ulk event r02 ss7 ainpop $

   33 onoa2 onoa $ ulk event r02 ss7 ainpop $

20.14 AIN: Resource Layer Re-engineering limitations

This functionality has the following limitations:

- The capacity increase applies only for the TRIGITM interface, not the TRIGGRP inerface. TRIGGRP to TRIGITM conversion must be done to take advantage of new higher limites.

20.15 AIN: STR-Connection Timer limitations

This functionality has the following limitations:

- When the TSTRCTimer parameter received in the STR message has a value between 61 to 300 mins, timer value is set to 60min.
- For the case when two TSTRC timers are running and no TSTRC timers running have limitations imposed by this design, limitations are addressed under subsections 2.2.2.1.1 and 2.2.2.1.3 , entitled ‘STR connection to a Remote IP.
- There are some transition limitations for NA015 and previous releases verses NA016, with respect to TSTRC timer control for Remote IP cases. These limitations depend on AIN00303SOC states in the Local and Remote SSPs and whether the Remote SSP is running NA015 or earlier loads.When two timers are running, one at Local and another at Remote, the first timer to expire releases the connection to IP and sends a ResourceClear message with ClearCause “ipTimeout”. There is no way to determine the cause of timer expiry in the Remote SSP, because it is included in the ISUP Release message from the Remote SSP.

20.16 Timeout Requested Event limitations

This functionality has the following limitations:

- No support is provided for calls involving more than three agents.
- The switch based feature controller and the AIN controller cannot be the same agent unless the switch based feature is CWT or one of its variations (CWI, CWC, CWO, TCW, CWD, CWTC).

  Note: The AIN controller is the agent originating the call that armed the Timeout event.

- If CHD is present on a terminator with CWT, the CPH event armed is closed when the call lands on a busy agent having CWT and CHD.
- Population of these parameters is not supported by DMS:
  - Originate_Call
  - Split_Leg
  - Move_Leg
  - Merge_Call
  - Reconnect
  - Disconnect_Leg
  - Acknowledge
- Population of the following parameters is not supported on the Timeout Requested Event query message sent by the SSP:
  - Amp1
  - Amp2
  - ExtensionParameter
- When a call-leg is receiving AIND or AINF treatment, all feature requests by any party on that call-leg are denied, during the time the treatment is being applied.
- CPH events can be armed only in one leg of the CHD call.
- In conference circumstances, when the AIND treatment is provided to an agent, the agent is taken down and the AIND log is generated. The remaining parties are re-configured according to feature behavior.

20.17 Multiple extended TCAP transactions limitations

This functionality is impacted by the following existing limitations:

- Parameter AIN_MAX_SERIAL_TRIGGER in table OFCENG limits the number of EDP-Rs and TDP-Rs that the SSP can send in a call leg. This parameter has a default value of six and a maximum value of twenty-four.
- The SSP can simultaneously attach eight timer resources to a call. The number of O_NoA and T_NoA events or triggers and switch-based features using timers, combined, can use eight timer resources at any given instant in a call. Examples of switch-based features using timers are CFDA, ISA, and NoA.
- Any O_No_Answer timer that expires while the SSP waits for a response to an O_No_Answer EDP-R or TDP-R must wait until the SCP receives and processes the previous O_No_Answer response.
- The limitations of OCM NELs apply to this activity.
- The limitation of more than three simultaneous timer expiries described in Section 20.23 on page 664 applies to OCM METT. Minimal impact occurs when multiple extended TCAP transactions use only one timer for NoA triggers and events of the same timer value in a particular allocation.

20.18 SOC restrictions and limitations

AIN Software Optionality Controls (SOC) has the following restrictions and limitations:

- any messages received from the SCP which contained errors are not counted
- a message from the SCP that is received and validated (has no protocol errors), but is later discovered to be SOC controlled, is still counted
- Outgoing messages that result in an SCCP return on an error message are still counted.
- During an ONP, counts which result from message processed between the datamove and SWACT stages of the ONP are lost.
- Default Routing operations are not counted.
- The usage-based billing option requires Nortel Networks and operating company cooperation.

For details about SOC characteristics and behavior, see Chapter 10: “Data schema” on page 319.

20.19 SFC and PFC customer group subscription limitations

SFC and PFC customer group subscription has the following limitations:

- The SFC and PFC customer group subscriptions only support RES and ISDN BRI lines. While provisioning on a customer group, all the agents within that customer group will be subscribed without any warning or errors. Checking for non-supported agents will be done only during run time.
- The SFC and PFC triggers that are subscribed on a customer group will not support a Continue response. If a Continue response is received, the call will route to AIN treatment.
- Option AINDENY can only be provisioned for 64k lines.

20.20 Tools limitations

This section describes the limitation associated with AINTRACE, TRAVER, and TSTQUERY.

20.20.1 AINTRACE limitations

AINTRACE has the following limitations and restrictions:

- AINTRACE is a single user tool.
- The maximum number of TIDs which can be selected at a time is 40.
- AINTRACE message log size is 32, 000 bytes. This log can accommodate 45 AIN messages before AINTrace loses the old messages.
- AINTRACE has no facility for tracing calls or retaining data over a restart. On a restart, all data is lost and the tool is re-initialized.
- AINTRACE does not capture a message when any non-call-related error occurs while building a query message or when a protocol error occurs.
- AINTRACE does not capture messages that are not part of a call-related transaction, except for messages: ACG, Monitor_For_Change, Update, Update_Data, Update_Request, and Update_Success.
- AINTRACE is not designed to handle all erroneous TCAP messages.

When an agent's TID is mapped to virtual identifiers (VIDs), (as in the case where there is more than one DN for each LEN) then the TID itself cannot be traced. Information can be collected against the VIDs.

Although AINTRACE has the capability of tracing VIDs that are associated with a TID, AINTRACE cannot trace feature keys, even when the feature key has a VID assigned to it. AINTRACE can only trace lines or trunks.

See Section 21.6 "Limitations" on page 465 for limitations associated with AINTRACE

20.20.2 TRAVER

TRAVER has the following limitations and restrictions:

- TRAVER does not build into a generated query message all the parameters that real call processing support. The user must manually add any missing parameters with TSTQuery.
- TRAVER does not support the LNP triggers for query message building.
- TRAVER does not support the attendant console agent for query message building.
- Calls that route through TR-533 E800 are not traced by TRAVER, however calls that use AIN Service Enablers' toll-free service are traced.
- LEAS traffic is not supported in TRAVER for query messages populating parameter LATA.
- AINMQG-TRAVER supports the triggers at five TDPs. The five TDPs are Origination_Attempt, Info_Collected, Info_Analyzed, Termination_Attempt and Network_Busy.
- Among the triggers at the TDP Info_Analyzed, trigger LNP is not supported in AINMQG-TRAVER.
- LEAs traffic is not supported in AINMQG-TRAVER for query messages populating the message parameter LATA.
- AINMQG-TRAVER does not support all message parameters introduced by the AIN triggers.
- TRAVER does not support serial triggering. When more than one trigger per call is expected, then it must be manually simulated using AINRES.
- The AC (Attendant Console) agent is not supported in TRAVER for query message building.

See Section 22.2 "Restrictions" on page 468 for limitations associated with TRAVER.

- TRAVER only supports line attribute response processing. Forwarding attributes are not supported by TRAVER.

20.20.3 TSTQuery

The TSTQuery tool has the following limitations and restrictions:

- Messages that originate from TSTQuery increment messaging OMs and the SOC counters that count event usage.
- The introduction of underscores into the message names means that TSTQuery files saved prior to NA009 cannot be loaded into versions of TSTQuery available as part of NA009 or later.
- Update_Data message is no longer valid as of NA009. Any TSTQuery files

containing an Update_Data message cannot be loaded into versions of TSTQuery available as part of NA009 or later.

- The next event list (NEL) transmitted in the EDP-Request and EDP-Notification message parameters of the message Request_Report_BCM_Event (RRBCME) is not sanity checked or enforced. When any RRBCME message is received, all of the event request and notification messages are available for the user to send. It is up to the user to comply with the NEL sent in the RRBCME.
- The number of bytes that can populate parameter IPReturnBlock is limited by the DMS Command Interface which restricts the number of characters that can be entered on a line. Since a byte can take up one, two or three characters, the actual number of bytes that can be entered depends on the size of the individual bytes entered.
- The SCP can attempt to cancel a non-user interruptible announcement when zero digits are collected by sending a Cancel_Resource_Event operation in a Conversation Package (GR-1298-CORE).
- Avoid using TstQuery during peak traffic periods because of the low Central Processing Unit (CPU) priority of Command Interpreter (CI) commands and the consequent impact on the T1 timer. Exercising the TstQuery tool does not affect switch traffic.

See Section 23.2 “Limitations” on page 618 for limitations associated with TSTQuery.

20.21 Event limitations and restrictions

The DMS-100 switch considers the PRI interface as a trunk and not a line, therefore, when the PRI interface is busy the call advances to the Network_Busy detection point. Since the PRI interface is treated as a trunk, the SSP can detect when the end-user is busy through intercepting messages with cause values.

The O_Called_Party_Busy, O_No_Answer and Network_Busy events can only be determined when the call is offered to a terminating agent on switch, or when the call is routed through the network through an ISUP trunk or a PRI trunk. The O_No_Answer event can also be determined when the call is routed through the network through one of the supported PTS trunks, as listed in Table 15 on page 122.

For a more exhaustive list of features, see Chapter 22: “AIN/DMS-100 interactions (A and B)” on page 707 through Chapter 2: “AIN/DMS-100 interactions (S to Z)” on page 163.

The NEL transaction can also be closed when the call terminates to an attendant console (AC) and the night service feature is encountered.

Busy indication is provided to the caller when a Continue response is received following a T_Busy EDP-R. Call Waiting or Call Forward Busy and ISDN Additional Call Offering are not encountered. See Section 10.4.5 “Continue message and processing” on page 450 for details.

When the SSP receives a Continue message in response to a T_No_Answer EDP-R, it continues to alert the called party, and Call Forward Don’t Answer (CFDA) features may be encountered. See Section 10.4.5 “Continue message and processing” on page 450.

For the O_No_Answer interaction, ISDN FLEX Call is not supported.

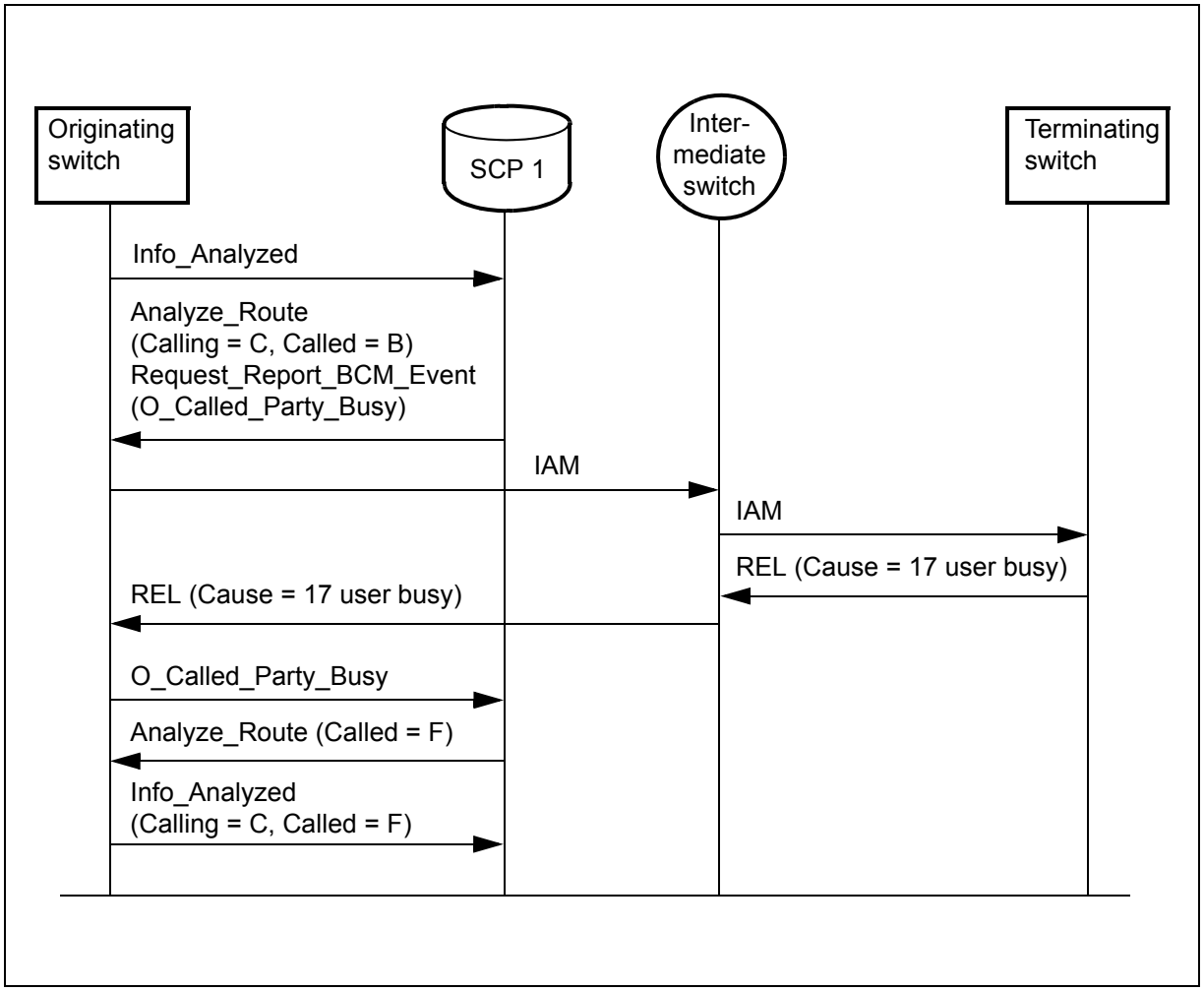
For an ISDN Flex call, the O_No_Answer processing on the first leg of the call is stopped once the controller flashes to establish the multi-way conference.

Treatments can be applied locally or non-locally for ISUP. It is important that the datafill in the TMTMAP table be set to apply treatment “NOLOCAL”. When the triggering switch has O_Called_Party_Busy armed and treatment is applied at another switch, then the event is not detected.

The T_Answer Event interactions are inherited from the TCM NEL feature. See Section 20.3.22 on page 646.

Figure 116 provides an example of messaging when treatment is set to non-local.

Figure 116 Example of messaging when treatment is set as non-local



See Section 20.7 “Attendant console limitations” on page 648 for event limitations related to interaction with attendant consoles.

For details about Event characteristics and behavior, see Chapter 8: “Originating call model events” on page 359 and Chapter 10: “Terminating call model events” on page 447.

20.22 Trigger limitations

This section describes limitations associated with the O_Called_Party_Busy, O_No_Answer, T_Busy, T_No_Answer, and Term_Resource_Available triggers.

20.22.1 Channel_Setup_PRI trigger

This section describes all the restrictions and limitations that apply to trigger Channel_Setup_PRI (PRIB):

- trigger Channel_setup_PRI is not supported on PRI looparound trunks (for example, a PRI call originates from a DMS-100 switch and terminates on a DMS-100 switch). When trigger Channel_setup_PRI is assigned to a PRI looparound trunk, the call is unpredictable unless all members have subscribed trigger PRIB.
- Subscription table AINPRI is 64K tuples in size.

20.22.2 O_Called_Party_Busy and O_No_Answer

This section describes all the restrictions and limitations that apply to triggers O_Called_Party_Busy and O_No_Answer.

Table 174 summarizes the limitations for triggers O_Called_Party_Busy and O_No_Answer with regard to the document Bellcore GR-1298-CORE AINGR: Switching Systems Sections 1-8, Issue 3, July 1996.

Table 174 Summary of triggers O_Called_Party_Busy and O_No_Answer limitations

Requirement number and source document	Limitation
GR-1298, Issue 3, Sect 4.2.2.13, R4-92 [82]	This trigger is not detected when terminating to a Virtual DN.
GR-1298, Issue 3, Sect 4.2.2.13, R4-94 [84]	In this release the trigger is only assigned on a subscribed basis and then the exclusion list of calling party DNs is not applicable.
GR-1298, Issue 3, Sect 4.5.3.6, R4-285 [246v2]	The SPID for ISDN is not included or supported in parameter UserID.
GR-1298, Issue 3, Sect 4.2.2.14, R4-97 [87]	In this release the trigger is only assigned on a subscribed basis and then the exclusion list of calling party DNs is not applicable. In the case of fault handling (for example, T1 timer expires), the processing continues alerting rather than providing final treatment.
GR-1298, Issue 3, Sect 4.2.2.14, R4-98 [88v2]	In this release the timer value can be administered on an office basis only. This timer is different from the existing event office wide timer.
GR-1298, Issue 3, Sect 4.2.2.14, R4-102 [92v2]	Parameter ClauseClose from the Close message that is sent to the SCP or adjunct, is set to “EDPSCompleted” instead of being set to “CalledPartyAnswered”.
GR-1298, Issue 3, Sect 11.3.1, R11-25 [1232]	In this release the timer value can be administered on an office basis only.
GR-1298, Issue 3, Sect 8.1.4, R8-31 [752]	O_Called_Party_Busy and O_No_Answer triggers are not supported when the CFW feature is activated on the terminating agent.

Table 174 Summary of triggers O_Called_Party_Busy and O_No_Answer limitations (Continued)

Requirement number and source document	Limitation
GR-1298, Issue 3, Sect 8.1.6, R8-40 [761]	Trigger O_Called_Party_Busy is not supported with a conference call.
GR-1298, Issue 3, Sect 8.1.19, R8-130 [850]	Trigger O_Called_Party_Busy is not supported with a conference call.
GR-1298, Issue 3, Sect 8.8.7, R8-221 [935]	Trigger O_Called_Party_Busy is not supported with a conference call.

The special delivery service feature is not allowed to intervene on the call when trigger O_No_Answer receives a Continue response from the SCP.

Trigger O_Called_Party_Busy is deactivated when a TWC flash occurs while waiting for the ISUP REL message.

For the O_No_Answer interaction, ISDN FLEX Call is not supported.

The Analyze_Route response to trigger O_No_Answer should not specify the same terminating DN.

A DMS peripheral module requires a minimum delay between successive commands. This requirement can be violated and the peripheral module can be overloaded when many iterations occur of an Analyze_Route responding to trigger O_No_Answer and specifying the same DN.

The following example illustrates a scenario where this occurs:

1. User A (who subscribes to trigger O_No_Answer) calls user B.
2. User B does not answer.
3. User A encounters trigger O_No_Answer and a query is sent to the SCP.
4. The SCP responds with an Analyze_Route message redirecting the call to user B.
5. The peripheral module receives then two commands:
   a. Disconnect from the called DN of B.
   b. Connect to the DN specified by the SCP's response message, this is B again.

When this scenario occurs, user B becomes out of service until the next audit because the delay between the disconnect and the connect command is too short for the peripheral module. In this scenario, the originating user (A) hears ringing followed by a fast busy.

For details about the characteristics and behavior of trigger O_Called_Party_Busy, see Section 7.17 “O_Called_Party_Busy trigger” on page 341.

For details about the characteristics and behavior of trigger O_No_Answer, see Section 7.18 “O_No_Answer trigger” on page 349.

20.22.2.1 OCPB and ONA triggers on PRI trunks

Incoming trunks with PRA trunks subscribed to O_Called_Party_Busy or O_No_Answer triggers can use the XLAIBN, XLALEC or RTEREF selectors in the LTCALLS table. When the RTEREF selector is used, the call route is allowed to go through as per translations.

Explanation: When the Call-by-Call (CBC) feature is active, incoming PRI calls route directly to VFGs through an RTEREF selector in table LTCALLS. AIN now supports the translation of Analyze_Route CalledPartyID for O_CPB, O_NOA, and the Info Collected triggers (or NELs, when NELs are armed in response to one of these triggers).

Note: Whenever a call gets routed via PRI to VFG, due to the RTEREF selector, the response simplification and other related PXLAMAP tuples are not encountered.

20.22.3 Prefix triggers

Table 175 provides a summary of the limitations and restrictions for Prefix triggers.

Table 175 Limitations and restrictions summary for Prefix triggers

Requirement number and source document	Limitation
DMS_REQ	Operating telephone company (OTC) carrier calls encounter trigger Specified_Carrier for line origination, but not for OTC nor FGC (ISUP) trunk origination. The reason is that lines still trigger because digit string is available, but ISUP trunks do not, because parameter carrier selection information is not available for OTC and FGC (ISUP).
GR-1298, Issue 3, Sect 4.2.2.10, R4-85	For ISDN BRI lines, Prefix triggers are assigned on a LTID (~TSP) basis only. These triggers cannot be assigned on call type (CT). This limitation is in line with all other AIN originating triggers.
DMS_REQ	10 “3 digits CIC” NPA NXX-XXXX and 101 “4 digits CIC” NPA-NXX-XXXX are invalid format for NI-2 PRI trunk.
DMS_REQ	Attendant console and E911 agents are not supported.
DMS_REQ	All incoming PRI calls with the NPI set to unknown that contain an OSA information element are not able to hit trigger Operator_Services.

20.22.4 T_Busy and T_No_Answer triggers

This section describes all the restrictions and limitations that apply to triggers T_Busy and T_No_Answer.

Table 176 summarizes the limitations for triggers T_Busy and T_No_Answer with regards to the document, Bellcore GR-1298-CORE AINGR: Switching Systems Sections 1-8, Issue 3, version 1, Dec 1996.

Table 176 Summary of limitations for triggers T_Busy and T_No_Answer

Requirement number and source document	Limitation
GR-1298, Issue 3, Sect 4.2.3.3, R4-113 [98], Sect 4.2.3.4, R4-119[104]	For ISDN interface, only BRI agents are supported. PRI agents are not supported. Subscription and triggering based on CT is not supported.
GR-1298, Issue 3, Sect 4.2.3.3, R4-114 [99]	Termination on a Virtual DN is not supported.
GR-1298, Issue 3, Sect 4.2.3.4, R4-120 [105v2]	The timer value is administrable on an office basis only.
GR-1298, Issue 3, Sect 4.5.4.3, R4-314 [269], Sect 4.5.4.5, R$-319[274]	Population of the following parameters are not supported: AMASequenceNumber, Amp1,Amp2, CalledPartyStationType, ExtensionParameter, SAP and STRConnection
GR-1298, Issue 3, Sect 4.5.4.3, R4-317 [272v2], Sect 4.5.4.5, R4-320[275]	For BRI agents, parameter UserID population with ISDNI of terminating facility is not supported, the DN of the terminating facility is used instead.
GR-1298, Issue 3, Sect 8.1.4, R8-24 [747]	Trigger Term_Resource_Available is not implemented.
GR-1298, Issue 3, Sect 8.1.15, R8-115 [835v2]	Trigger Term_Resource_Available is not implemented.

20.23 No_Answer events and triggers

No more than three simultaneous timer expiries can be handled on the same call, so services should be implemented so as to avoid scenarios where more than three NoAnswer timers expire at the same time. There are four No_Answer triggers and events: O_No_Answer trigger, O_No_Answer event, T_No_Answer trigger, and T_No_Answer event. When any combination of four or more of these No_Answer timers expire at the same time, only three timers are processed. The trigger and event timers that are not processed, are not detected.

The timer value for the O_No_Answer trigger is determined by tuple AIN_O_NO_ANSWER_TRIGGER_TIMER in table OFCENG (default is 18 seconds).

The timer value for the O_No_Answer event is determined in the following order:

1. parameter O_No_AnswerTimer in the Request_Report_BCM_Event message
2. tuple AIN_O_No_ANSWER_EVENT_TIMER in Table OFCENG (default is 18 seconds)

The timer value for the T_No_Answer trigger is determined by tuple AIN_T_No_ANSWER_TRIGGER_TIMER in table OFCENG (default is 18 seconds).

The timer value for the T_No_Answer event is determined in the following order:

1. parameter T_No_AnswerTimer in the Request_Report_BCM_Event message
2. tuple AIN_T_NO_ANSWER_EVENT_TIMER in table OFCENG (default is 18 seconds)

Providing different default timer values in table OFCENG for each trigger and event reduces the risk that four or more NoAnswer timers can expire at the same time.

20.24 Trigger Term Resource Available

Trigger TRA processing does not support:

- subscription and triggering based on the call type
- trunk subscription to trigger TRA
- TRA for Attendant Console for subscription and encountering
- virtual DNs for subscription of trigger TRA
- manual line for subscription and encountering of trigger TRA
- AIN virtual directory number (VDN) for subscription and encountering of trigger TRA
- on the TRA query message sent by SSP, population of the parameters that follow:
  - CTRConnection
  - AMASequenceNumber
  - Amp1
  - Amp2
  - ExtensionParameter

— SAP

— STRConnection

- default routing. When the response from the SCP is not received by the SSP, call processing continues by alerting the terminator.

20.25 Trigger feature interaction limitations and restrictions

The following sections describe limitations and restrictions that apply to AIN feature trigger interactions.

For details about the interactions between triggers and call processing features, see Chapter 22: "AIN/DMS-100 interactions (A and B)" on page 707 through Chapter 2: "AIN/DMS-100 interactions (S to Z)" on page 163.

20.25.1 Analog display services interface

The limitations and restrictions are as follows:

- This activity does not address TR-NWT-000416 (Call Waiting Deluxe feature) interworking requirements with AIN. Therefore, this feature does not address compliant issues with TR-NWT-000416 (R-202 through R-229).
- AIN Distinctive Ringing (DRING) is not supported for re-alert since it is not required by specification. Switch-based alerting is applied during the re-alert irrespective of AIN Distinctive Ringing (DRING).
- Parameter ControllingLegTreatment (CLT) is not applied after the party with a call waiting hangs up. For example, when A is a call waiting on B with CLT being applied as a distinctive call waiting tone, and B hangs up, then parameter CLT is no longer applied and B receives normal ringing or switch-based distinctive ringing when necessary.
- AIN Distinctive Ringing/Call Waiting (DRCW) is not supported for Meridian business sets (MBS) or Meridian feature transparency (MFT) sets.
- Parameter ControllingLegTreatment is not applied on the second leg of a Three-way Calling (3WC) scenario when the conference state is established while the terminator is ringing.
- Distinctive Ringing (DRING) uses coded ringing. When the called party is a party line or is served by a peripheral that does not support coded ringing, then parameter ControllingLegTreatment is disregarded and switch-based alerting is applied.
- Parameter the ControllingLegTreatment is present, the corresponding distinctive ringing pattern in the DMS software is applied. This value overrides any switch-based distinctive ringing including DRCW ringing and teen services ringing.

20.25.2 Automatic call distribution

The AINDN option cannot be assigned to an automatic call distribution (ACD) DN.

20.25.3 Billing features limitations and restrictions

In the case of virtual DN trigger TERMATT, the CLD NO field of the SMDR records (dialed digit) is overwritten by the 10 digits of the virtual DN.

Only ISDN and Study information is re-generated after deleting a pre-SDS originating equal access record.

A billing record occurs when the call cannot complete because the call was sent to one of the following treatments:

- vacant code (VACT)
- unassigned number (UNDN)
- blank directory number (BLDN)

In the NA013 product release, a billing record occurs for SRRR.

20.25.4 Call Forwarding feature limitations and restrictions

The limitations and restrictions are as follows:

- A remote call forwarding directory number (RCF DN) cannot subscribe to trigger AFR on an individual subscriber basis. Trigger AFR can only be encountered on the RCF forwarding leg when AFR is encountered and it is subscribed on an office-wide basis.
- An RCF DN cannot subscribe to trigger Off-hook_Delay. Therefore, no triggers at the Info_Collected TDP can be encountered during translation of an RCF call leg.
- Regression is not supported by AIN Service Enablers for all variants of Call Forward Don’t Answer. When triggering takes place while a call is being forwarded under one of these features and the call is not able to terminate on the final station, the call goes to treatment.
- An RCF DN cannot subscribe to triggers Termination_Attempt. However, on the RCF forwarding leg the Termination_Attempt TDP can be encountered at the remote station.
- The Deny Call Forwarding (DCF) feature is ignored for calls that encounter AIN Service Enablers triggering during switch based call forwarding.
- AIN response processing ignores Call Forwarding Intragroup restrictions. This means that AIN allows calls to be forwarded outside of the customer group when the SCP instructs the SSP to do so.

- AIN Service Enablers originating triggers can be encountered during the forwarding leg only when both the originating station and base station are supported AIN agents. Triggering at AIN Service Enablers terminating triggers during call forwarding can be encountered only when both the originating station and remote (terminating) station are supported AIN agents (the base station can be a supported AIN agent). When, in either of these cases, one of the agents is not a supported AIN agent the call is not forwarded.
- In the case where RCF forwards to an ISUP trunk the RCF OriginalCalledNumber, RedirectingNumber, and RedirectionCount are not outpulsed on the trunk.
- N11 trigger and call forwarding:
  - — There are certain types of call forwarding that do not allow forwarding to certain N11 numbers. When forwarding to an N11 number is blocked, it is not possible to trigger at the N11 trigger while call forwarding. However, it is possible to trigger at N11 when the forwarding leg sent an AIN Service Enablers query and the N11 digits are supplied by the SCP response.
  - — AIN Service Enablers does not support call forwarding to Vertical Service Codes.
  - — When an AIN Service Enablers trigger is encountered during CFWVAL Termination Validation, the 2-minute timer is started when the first AIN trigger is encountered and trigger criteria is met. Therefore, there can be situations where the 2-minute timer expires before the call terminates. In these cases, when activation does not take place on the first call, the second call attempts to translate and terminate again.
  - — There are certain types of call forwarding that do not allow forwarding to certain N11 numbers. When forwarding to an N11 number is blocked, it is not possible to trigger at trigger N11 while call forwarding. However, it is possible to trigger at N11 when the forwarding leg sent an AIN Service Enablers query and the N11 digits are supplied by the SCP response.

    AIN Service Enablers does not support call forwarding to Vertical Service Codes.

    When an AIN Service Enablers trigger is encountered during CFWVAL Termination Validation, the 2-minute timer is started when the first AIN trigger is encountered and trigger criteria is met. Therefore, there can be situations where the 2-minute timer expires before the call terminates. In these cases, when activation does not take

place on the first call, the second call attempts to translate and terminate again.

- A user receives negative acknowledgment (NACK) treatment when trying to program an AIN feature access code during call forwarding programming.

20.25.5 Call transfer limitations and restrictions

When a Multi-way call is set up using the Meridian business set (MBS) single button transfer feature (also known as quick conference key [QCK]), no originating triggers are encountered on the new leg of the call.

20.25.5.1 Blind transfer recall and identification limitations and restrictions

The limitations and restrictions are as follows:

- When a PassiveLegTreatment, or a ControlLegTreatment is specified in an AIN response, it applies only while the transferring party is still part of the call. As soon as the transferring party goes on-hook, these treatments are no longer applied to the terminating DN.
- When a transferred call encounters a SDS trigger with an Analyze_Route or Continue response with an AMASLPID, an AMA record is generated when the call is answered. This also occurs when the transferred call encounters Termination_Attempt with a Forward Call or Authorize Termination response. However, when the transferred call goes unanswered and the transferring party answers on recall, an erroneous AMA record with COMPLETION_IND set to ANSWERED is generated. Send Notification/Termination Notification (SN/TN) is affected similarly when the transferred call goes unanswered.

20.25.6 CLASS features limitations and restrictions

When an SCP database sends parameter CallingPartyID in a response message that is not 10 digits in length, various restrictions apply. It is recommended that parameter CallingPartyID always be sent as a 10-digit number. See the following sections for details:

- Section 23.7.3 “CLASS automatic recall” on page 853
- Section 23.7.6 “CLASS bulk calling line identification” on page 862
- Section 23.7.12 “CLASS calling number delivery” on page 880
- Section 23.7.14 “CLASS customer originated trace” on page 885
- Section 23.7.16 “CLASS distinctive ringing and call waiting” on page 889
- Section 23.7.19 “CLASS selective call acceptance” on page 896 through Section 23.7.21 “CLASS selective call rejection” on page 901

20.25.7 Direct inward system access features limitations and restrictions

The direct inward system access features limitations and restrictions are as follows:

- No AIN Service Enablers triggers can be encountered once either Call Forwarding Remote Access (CFRA) or remote Call Forwarding All Calls (CFW) without unique PIN has been invoked.
- The Off-hook_Immediate (OFFHKIMM), Public_Feature_Code (PFC), Shared Inter-Office trunk and Termination_Attempt (TAT) triggers are not applicable to a DISA DN.

20.25.8 Display features limitations and restrictions

20.25.8.1 EBS display features

The following limitations and restrictions apply to all the EBS Display features discussed in this document. In addition, specific exceptions and additional restrictions are documented in the remaining sections which deal with each of the display features.

- A call which has been forwarded as a result of an AIN Service Enablers Forward_Call response is not treated as a forwarded call for display purposes. For example, when Name and Reason Display has been assigned, a call which has been forwarded by a Forward_Call would be displayed only as a direct call, that is, no reason information is displayed.
- Parameter RedirectingPartyID in an Analyze_Route response is not displayed for calls within the same office.

20.25.8.1.1 Name and reason display When the CallingPartyID DN field in parameter CallingPartyID, sent in an SCP response, is the same as the originating party DN and the SCP Presentation Restriction Indicator is presentation-restricted, then the reason is not displayed.

20.25.8.1.2 Network name display When the CallingPartyID DN field of parameter CallingPartyID is sent in an SCP response is different from the originating party DN then:

- For calls going over an ISUP trunk using the query method, the terminating agent displays the CallingPartyID DN supplied by the SCP and displays the name associated with the originating DN.
- After Call Transfer and Recall or after Executive Busy Override (EBO), the display shows the originating DN instead of the SCP supplied CallingPartyID DN.
- Although switch datafill indicates that the SETUP method should be used to obtain the name, when the name is not available then the QUERY method is used for EBS sets.

20.25.9 Distinctive ringing features limitations and restrictions

The following section describes the limitations and restrictions that apply to Distinctive Ringing.

20.25.9.1 AIN distinctive alerting and AIN distinctive alerting/call waiting limitations and restrictions

The limitations and restrictions are as follows:

- Parameters ControllingLegTreatment and PassiveLegTreatment are disregarded when terminating to a line served by a peripheral that is not configured to support coded ringing. AIN Distinctive Ringing is supported only on peripherals using coded ringing.
- The ControllingLegTreatment or PassiveLegTreatment is not applied to the second leg of a 3WC scenario once the conference state is established while the terminator is ringing.
- When a call with parameter ControllingLegTreatment or PassiveLegTreatment is attempted to a busy party with call waiting (CWT), parameter ControllingLegTreatment or PassiveLegTreatment is applied only as a distinctive call waiting tone. When the called party becomes available, then the ControllingLegTreatment or PassiveLegTreatment is no longer applied. Instead, the called party receives normal ringing, or switch-based Distinctive Ringing, when necessary, indicating the presence of an unanswered call.
- The ControllingLegTreatment or PassiveLegTreatment is not used for Call Waiting purposes on MBS or MFT sets.
- AIN Distinctive Alerting is not supported for re-alert. Switch-based alerting is applied during the re-alert irrespective of AIN Distinctive Alerting.
- The enhanced call waiting package must be present in an office in order to use enhanced call waiting tones.
- AIN Distinctive Alerting is implemented based on the existing Distinctive Alerting feature, all current restrictions and limitations of Distinctive Alerting are maintained.

20.25.10 Emergency service limitations and restrictions

The limitations and restrictions are as follows:

- A line with the Emergency Service Line (ESL) option cannot subscribe to AIN originating or terminating triggers. Subscription is blocked in SERVORD.
- Subscription to Termination_Attempt for an E911 public safety answering point (PSAP) agent is not currently supported by AIN Service Enablers
- E911 Ringback is not supported over IT trunks.

- E911 is not compatible with any CLASS feature.
- The completion indicator field of the record shows a '08 = Not Completed: No answer supervision returned' when all of the following conditions occur:
  - — The N11 trigger is turned OFF.
  - — There is a routing response (Analyze Route, Create-Call, or Collect Info) from the SCP to 911.

    Note: 911 customers do not use billing.

  - — An AMAslpID is returned in the response.
  - — The call routes to an ES trunk.
  - — The call completes.

20.25.11 Hotline features limitations and restrictions

All originating and terminating triggers are ignored for calls originating from a line having the MAN option. No digits can be collected on such lines.

20.25.12 Hunt group features limitations and restrictions

Parameter BusyType reflects the offer status of the triggering agent, not the hunt group, when encountering trigger detection point T_Busy for Hunt group terminations.

20.25.13 Bridged night number

When AIN functionality is desired on a Bridged Night Number (BNN), the BNN must be created using the EST command. Using the ABNN command to create a BNN creates a BNN in the normal fashion, but AIN functionality is disallowed.

The AIN and AINDN options cannot be added to BNNs that apply to hunt groups made up of EBS agents. The ADO command is rejected from within SERVORD.

20.25.14 Intercept features limitations and restrictions

The following section describes the limitations that apply to Intercept features.

20.25.14.1 Flexible intercept

After the call encounters originating trigger, Off-Hook_Immediate, with an Analyze_Route response to a FLEX number, the call goes to treatment.

20.25.15 Intercom features limitations and restrictions

The following section describes the limitations that apply to Intercom features.

20.25.15.1 Single party revertive calling

INT processing is encountered while processing the response from the AIN SCP (either Analyze_Route, Forward_Call, Continue, or Authorize_Termination). When INT is activate (for example, when the response directs the call to the same line as the originator) following an Analyze_Route or Forward_Call response, the call is sent to FNAL treatment.

20.25.16 Messaging features limitations and restrictions

The limitations and restrictions are as follows:

- For special delivery service (SDS), the portion of the call that routes the SDS subscriber to the VMS DN, can only encounter the Termination_Attempt and 3- to 10-digit SDS triggers subscribed by the VMS DN. No other trigger is encountered on this portion of the call.
- For universal voice messaging (UVM), the portion of the call from the UVM subscriber to the VMS, trigger Off-hook_Delay (OHD) is not encountered.
- For executive message waiting (EMW), the caller cannot leave a message for a party that does not have EMW.
- A message cannot be left in the following scenario: A and C, both with EMW, are in the same customer group. B is in another customer group or is a POTS line. B is subscribed to trigger Termination_Attempt with a Forward_Call response routing to C. A calls B, gets routed to C, and cannot leave a message.

  Trigger Termination_Attempt is not encountered when an EMW call is returned. That is, when a party subscribed to AIN trigger Termination_Attempt, calls and leaves a message using EMW, the call cannot be returned using EMW. Trigger AIN Termination_Attempt is not encountered and the call is routed to BUSY treatment. CallRequestRetrieval does not interact with trigger Termination_Attempt as it is an unsupported interaction.
- For station message waiting (MWT), when calls are made from a line subscribed to trigger Termination_Attempt, messages can be left using MWT but these calls cannot be returned. Termination_Attempt does not get encountered when using MWT to return a call to a DN subscribed to it and busy treatment is received.
- A message cannot be left in the following scenario: A and C, both with MWT, are in the same customer group. B is in another customer group or is a POTS line. B is subscribed to trigger Termination_Attempt with a Forward_Call response routing to C. A calls B, gets routed to C, and cannot leave a message.

20.25.17 Multiple appearance directory number limitations and restrictions

Multiple appearance directory numbers (MADNs) terminate when trigger detection point T_Busy is encountered, and parameter BusyType reflects the offer status of the triggering agent, not the MADN group.

20.25.18 O_CPB and O_NoA trigger screening limitations and restrictions

The called DN screening is based on the public North American dial plan (of the form NPA-NXX-NXXX or NXX-NXXX), therefore, the OTS called DN screening does not apply to intra-customer group calls using a customized dial plan. For example, digit screening is not applied to a Centrex customer who dials a 4-digit number for an internal call, however, calls from a Centrex group to the public network is screened by the OTS feature.

20.25.19 Ring again and call back queuing limitations and restrictions

The limitations and restrictions are as follows:

- When a user attempts to invoke Nodal Ring Again (RAG) or Call Back Queueing (CBQ) on a call that has received an Analyze Route message or a Forward Call message as a response to a query, the attempt to invoke RAG or CBQ is disallowed.
- When a user attempts to invoke Network Ring Again (NRAG) on a call that has received an Analyze Route or a Forward Call message in the same office as the originator, the attempt to invoke NRAG is disallowed.

20.25.20 Routing features limitations and restrictions

The following sections describe the limitations and restrictions that apply to routing features.

20.25.20.1 Expensive route warning tone

While processing an Analyze_Route or Forward_Call response from the SCP, no ERWT is heard.

20.25.21 Simplified message desk interface limitations and restrictions

The simplified message desk interface limitations and restrictions are as follows:

- When an SCP database sends parameter RedirectingPartyID in a response message that is not 10 digits in length, various restrictions apply. It is recommended that parameter RedirectingPartyID always be sent as a 10-digit number. See Section 2.3 “Simplified message desk interface” on page 168.
- For simplified message desk interface (SMDI), on calls involving AIN redirections and switch-based redirections other than call forwarding (that is, LOD, KSH, SCMP), the order of redirections with respect to AIN is not

supported at the present. Thus, the Forwarding DN and the type of call forwarding sent to the SMDI link can be incorrect. See Section 2.3 “Simplified message desk interface” on page 168.

20.25.22 Simultaneous ringing limitations and restrictions

Parameter BusyType reflects the offer status of the simultaneous ringing (SimRing) Pilot, not the non-pilot members when calls terminate on a SimRing Pilot after encountering TDP T_Busy.

20.25.23 Softkey display limitations and restrictions

The line option AIN is blocked from being subscribed to an MFT set with the Softkey Display option through SERVORD. When AIN is datafilled without using SERVORD, triggers at the Origination_Attempt and Info_Collected TDPs (Off-hook_Immediate, and Off-hook_Delay) is not hit.

20.25.24 Speech activated intelligent dialing limitations and restrictions

The limitations and restrictions are as follows:

- During a Send_to_Resource operation, when the user is prompted to enter digits, the user cannot use SAID (IP dialing) to enter them. The user must enter the digits manually.
- Interaction between SAID Stringing of Digits (SOD) and AIN Service Enablers is currently blocked on a per-call basis.
- For more information see Section 2.6.2 “SAID stringing-of-digits (SOD)” on page 178.

20.25.25 Speed calling limitations and restrictions

AIN feature access codes cannot be programmed into a speed call cell. Any attempt produces a negative acknowledgment (NACK) treatment.

20.25.26 Suppressed ringing feature limitations and restrictions

The limitations and restrictions are as follows:

- For Suppressed Ringing Access (SRA) only AIN origination triggers can be encountered. Trigger Termination_Attempt is not encountered.

  See Section 2.8.2 “Suppressed ringing for telemetry” on page 190.
- For Suppressed Ringing for Telemetry (UTS) neither AIN origination nor AIN termination triggers is encountered.

20.25.27 Termination restrictions features

When a Forward_Call response is received as a result of encountering trigger Termination_Attempt, the call is forwarded before hitting DIN. The call starts a new leg, with the Termination_Attempt subscriber as the new originator. When the Forward_Call response routes the call to a DIN subscriber, DIN

checking is based on the INTRAGROUP information for the forward leg of the call and the customer group of the Termination_Attempt subscriber.

20.25.28 T_Busy event

After the Offer_Call message is received, the T_Busy event is not encountered (even when it is present in the NEL component of the Offer_Call response message).

20.25.29 Virtual facility group limitations and restrictions

The limitations and restrictions are as follows:

- When attempting to route a call using an AR response with a PrimaryTrunkGroupID, AlternateTrunkGroupID, and a SecAlternateTrunkGroupID to VFG selectors, multiple VFGs can be throttled for the one call depending on the datafill and setup of the VFGs and trunk circuits.
- When VFGLA is performed and an AIN Service Enablers OCM trigger is encountered (and the AR response has a different VFG from the one reserved by the VFGLA) the call throttles the VFG indicated in the AR response. The call continues to hold onto the VFG reserved by VFGLA until it completes.

20.25.30 WATS limitations and restrictions

All individual based triggers, OFFHKIMM, OFFHKDEL, and individual AFR are not supported for the WATS line. Subscriptions to these triggers are blocked in SERVORD.

20.25.30.1 Zone screening

The call goes to treatment when the following two criteria are met;

- The Analyze Route response is returned from the SCP without a TrunkGroupID but with either a carrier number and a CalledPartyID or only a CalledPartyID.
- The destination zone falls outside the allowed termination.

20.25.31 Other feature limitations and restrictions

Interworking between AIN services and any digital multiplex system (DMS) switch feature that is not discussed in this document is not supported. Any existing restriction regarding individual feature coexistence or operation remains in effect.

20.25.31.1 Resource monitoring for lines

The following limitations apply to resource monitoring for lines:

- Monitor_For_Change requests are lost during warm, cold and reload restarts.
- Monitor_For_Change requests are lost on ONPs and ABORTSWACTs.
- There can be a maximum of five active monitors on a line at a given time. Certain other features that use the internal feature queueing mechanism, such as automatic call back (ACB), can reduce this maximum number when they are already queued on the requested agent.
- The maximum number of monitors that can be active on a switch is 2000, due to a limited number of resources available on a switch.
- The maximum monitor time is 24 hours.
- The bearer capabilities supported are BC_SPEECH, BC_3_1_KHZ, BC_56K_DATA and BC_64K_DATA.
- For KSETs and ISDN BRAMFTs, the maximum number of monitors that can be active on a CWT key is five. This places a limitation on the total number of monitors that can be active on the DNs of the set.
- Monitor_For_Change for lines supports only CWT, CCW, AFC, ACOU, DTM, SUS, RSUS, PLP, MSB and DND switch-based features.
- When a termination restriction feature is added on a line after a monitor has been started, it is ignored.
- When the status of the agent changes to LO, NEQ, INB, or MB after a successful monitor is setup, the status change is ignored.
- Only ISDN BRAFS (NI1) sets are supported.

20.25.31.2 Resource monitoring for hunt groups

The following limitations apply to resource monitoring for hunt groups:

- Monitor_For_Change for hunt groups supports only multi-line hunt groups.
- When a member is added to the MLH hunt group after a monitor is set up, it does not account for determining the status of the hunt group.
- There can be a maximum of five active monitors on a hunt group at a given time. Certain other features that use the internal feature queueing mechanism, such as automatic call back (ACB), can reduce this maximum number when they are already queued on the requested agent.
- The maximum number of monitors that can be active on a switch is 2000, due to a limited number of resources available on a switch.
- The maximum monitor time is 24 hours.

- The limitation on the Bellcore specification is that only 2047 hunt groups can be monitored. It has been raised as an issue to Bellcore.
- Monitor_For_Change requests are lost on warm, cold and reload restarts.
- Monitor_For_Change requests are lost on ONPs and ABORTSWACTs.
- Monitor_For_Change requests for MLH hunt groups are supported for only the following bearer capabilities
  - — speech for analog lines
  - — ISDN agents voice and data (BC_SPEECH, BC_3_1_KHZ, BC_56K_DATA and BC_64K_DATA)
- When the status of the agent changes to LO, NEQ, INB, or MB after a successful monitor is setup, the StatusReported message at the time out does not depend on the change of state of the facility (while the monitor was active).
- The SSP ignores the presence of LOD or LOR on the hunt group and treats the hunt group as busy when all the hunt members are busy. LOD and LOR are not supported in the NA012 release of Monitor_For_Change.
- When a termination restriction feature (for example: DTM, DIN, RMB, SUS and PLP) is made active or inactive (after a successful monitor is setup), the result of the monitor operation is unreliable.
- When the monitor times out with no state change occurring, the time out message is not reliable when any of the termination restriction features ((DTM, DIN, RMB, SUS, or PLP) were added to any of the members during the monitor time.
- Denied incoming (DIN) is treated as a termination restriction on a member of a hunt group when it also has the DINE option on it.
- For ISDN hunt groups, the DN based call type is not considered while determining when a call can be terminated on a member of the hunt group. The call type assigned to individual members is considered when determining the status of the member.
- When the MSB key is used to activate/deactivate MSB on an ISDN member, there is no attempt to match the BearerCapability (in the Monitor_For_Change query message) with the call type supported by the member on which the MSB activation/deactivation occurred.

20.26 CPH and Multi-conferencing chaining limitations

CPH Multi-Conferencing/Conference Chaining is not supported with the exception of the following:

- MADN Bridged member is allow to establish a 3WC Conference.

With the above exception, if CPH is associated with an established Conference (i.e., MADN Bridging, FlexCall or 3WC), then Conference Members are blocked from activating a Conference (i.e., MADN Bridging, FlexCall or 3WC).

The following CPH Multi-Conferencing interactions are blocked:

- FlexCall-MADN Bridging
- FlexCall-3WC
- FlexCall-FlexCall
- MADN Bridging-FlexCall
- MADN Bridging-MADN Bridging
- 3WC-MADN Bridging
- 3WC-FlexCall
- 3WC-3WC

20.27 TKTERM trigger limitations

This section describes the limitations and restrictions of Trunk Group trigger.

Without datafilling LARP option for TKTERM trigger, Forward_Call response may not be valid, except in scenarios where valid Primary Trunk Group Id, Alternate Trunk Group Id, Second Alternate Trunk Group Id parameters are received in the FC response and further translations are not required.

Population of the following parameters is not supported on the TKTERM query message sent by SSP.

- CTRConnection
- AMASequenceNumber
- Amp1
- Amp2
- ExtensionParameter
- SAP

- STRConnection
- RTPSerivceIndicator

Traver for Authorize_Termination response is not supported.

Currenlty DPT and SIPT trunks are not supported.

TKTERM trigger is not supported for trunk agents which do not have members in table TRKMEM.

Part III Interactions

Part III: “Interactions” consists of the following:

Chapter 21:“AIN interactions introduction”

Chapter 22:“AIN/DMS-100 interactions (A and B)”

Chapter 23:“AIN/DMS-100 interactions (C)”

Chapter 24:“AIN/DMS-100 interactions (D to H)”

Chapter 1:“AIN/DMS-100 interactions (I to R)”

Chapter 2:“AIN/DMS-100 interactions (S to Z)”

Chapter 3:“Attendant console interactions”

Chapter 4:“Other interactions”

21 AIN interactions introduction

WARNING
Limited information source
The status of each feature (documented in the interactions chapters) is provided as an indicator. Please read all information associated with each feature.

AIN interacts with many DMS-100 switch features. The feature interactions chapters of this service implementation guide (SIG) describe those interactions.

Note: Read Section 21.1 “Overview” and Section 21.4 “General information” on page 730 of this chapter before reading the feature interactions chapters that follow. See Chapter 20 “Limitations” for limitations and restrictions associated with feature interactions.

21.1 Overview

This chapter introduces the feature interactions chapters. A description of the layout of these chapters follows. The chapters are divided into sections of features. The features are presented in alphabetical order.

Each section contains the following items:

- a description of the DMS-100 feature
- a table that describes AIN trigger interactions with the feature
- a table that describes AIN event interactions with the feature
- when applicable, a table that describes AIN interactions with the feature not related to triggers or events (for example, interactions with parameters, responses, response processing, and criteria checking)

  Note: When feature information is missing from this table, consider the feature status as unsupported, untested (UU).

21.2 Legend

Table 179 on page 718 provides a legend of conventions and acronyms that are used in the interactions tables.

Table 179 Table legend

Acronym	Definition	Meaning	Notes
S	Supported	Nortel Networks analyzed this feature and determined that it works appropriately with AIN. ***Note:*** Supported does not imply that a feature is compliant. For compliancy information, please refer to Nortel Network's GR-1298-CORE compliance matrix (available from Nortel Networks).	A feature can be classified as "S", even though a particular AIN trigger is not hit. The trigger is not hit because that is the desired functionality.
PS	Partially supported	Nortel Networks analyzed this feature and except for the documented restrictions, determined that this feature works appropriately with AIN.	Restrictions include the following items: • events that are closed • triggers that are not detected • interactions not supported on a particular agent type
U	Unsupported	Nortel Networks is aware of problems with this feature. Do not use this feature with AIN.	Problems can include: • anything that can cause service affecting problems or loss of service • triggers that cannot be subscribed • features that are normally activated during routing, but will not activate during AIN response processing • SCP responses that send the call to treatment
Note 1: Ensure that information in all tables (trigger, event, and other) is considered when trying to understand the interaction behavior. For example, when a trigger has an "S" status, verify that the "Other interactions" table doesn't list a response that isn't supported. ***Note 2:*** Unless otherwise specified, interactions apply to intra-switch call scenarios. For example, the interaction between speed call and trigger SIT is set to not applicable because speed call and trigger SIT (an originating trunk trigger) can never occur on the same switch.			

Table 179 Table legend (Continued)

Acronym	Definition	Meaning	Notes
UU	Unsupported, untested	Nortel Networks has not analyzed this feature. This feature could function incorrectly with AIN.	***Note:*** Nortel Networks deems any feature not listed in this document as unsupported/untested.
NA	Not applicable	This feature does not apply to a particular AIN trigger or event.	For example, when a specific switch-based feature is not supported on primary rate interface (PRI) agents, trigger PRIB is classified as NA.
Note 1: Ensure that information in all tables (trigger, event, and other) is considered when trying to understand the interaction behavior. For example, when a trigger has an “S” status, verify that the “Other interactions” table doesn’t list a response that isn’t supported. ***Note 2:*** Unless otherwise specified, interactions apply to intra-switch call scenarios. For example, the interaction between speed call and trigger SIT is set to not applicable because speed call and trigger SIT (an originating trunk trigger) can never occur on the same switch.			

21.3 DMS-100 features

Table 180 provides an alphabetical listing of DMS-100 features discussed in the feature interactions chapters.

Table 180 DMS-100 features

Feature
Analog display services interface features
spontaneous call waiting identification (SCWID)
SCWID with disposition (DSCWID)
Automatic call distribution features
ACD call forcing
ACD InCalls key
ACD transfer to InCalls key
ACD login
ACD login enhancement
ACD logout
ACD terminations
Bearer capability (BC) feature
Basic rate interface specific features
additional call offering unrestricted (ACOU)
additional functional call (AFC)
block called number (BLOCKCDN)
block calling number (BLOCKCGN)
flexible calling (FC)
Billing features
account codes
customer dialed account recording (CDAR)
special billing (SPB)
station message detail recording (SMDR)

Table 180 DMS-100 features (Continued)

Feature
terminating billing option (TBO)
Busy override features
executive busy override (EBO)
Call-by-Call (CBC)
Call forwarding features
call forwarding (CFW)
call forwarding busy (CFBL/CFB)
call forward don’t answer features (CFDA/CFD)
call forwarding group don’t answer for POTS, IBN, and RES lines (CFGD/CFGDA)
call forward programming (CFWP)
call forwarding remote access (CFRA)
call forwarding timed (CFT)
call forwarding validation for RES and IBN (CFWVAL)
Miscellaneous information on other call forwarding features
Call messenger features for RES
intentional call messenger (ICMSG)
standard call messenger (SCMSG)
Call park and call pickup features
call park (CPK)
directed call park (DCPK)
security code (directed call park)
call park recall identification
call pickup (CPU)
directed call pickup (DCPU)
directed call pickup with barge in (DCBI)
directed call pickup with non-barge in (DCBU)

Table 180 DMS-100 features (Continued)

Feature
trunk answer from any station (TAFAS)
Call transfer features
blind transfer recall or identification
call redirect (CRT)
call transfer (CXR)
MBS single button transfer (QCK)
Call waiting features
call waiting (CWT)
call waiting intragroup (CWI)
call waiting chaining (CWC)
call waiting conference (CWTC)
call waiting originating (CWO)
cancel call waiting (CCW)
dial call waiting (CWD)
talking call waiting (TCW)
CLASS features
CLASS—anonymous caller rejection (ACRJ)
CLASS—automatic call back (ACB) — MDC and RES
CLASS—automatic recall (AR) — MDC and RES
CLASS—automatic recall limited to one
CLASS—auto recall blocking of private calls (CABOP)
CLASS—bulk calling line identification (BCLID)
CLASS—calling name and number blocking (CNNB) — RES
CLASS—calling name and number display (CNND) — RES
CLASS—calling name delivery (CNAMD) - TR1188 TCAP:MDC and RES
CLASS—calling name delivery (CNAMD) - Nodal — RES

Table 180 DMS-100 features (Continued)

Feature
CLASS—calling number blocking (CNB) — RES
CLASS—calling number delivery (CND) — RES
CLASS—calling number delivery blocking (CNDB) — RES
CLASS—customer originated trace (COT) — MDC and RES
CLASS—dialable directory number (DDN) — RES
CLASS—distinctive ringing and call waiting (DRCW)
CLASS—long distance indicator enhancement (LDI)
CLASS—message waiting indicator (CMWI)
CLASS—selective call acceptance (SCA) — MDC and RES
CLASS—selective call forwarding (SCF) — MDC and RES
CLASS—selective call rejection (SCRJ) — MDC and RES
Class of service features
automatic number identification (ANI)
flexible ANI (FANI)
hotel/motel (HOT)
restricted sent paid (RSP)
Conference features
meet-me conference
preset conference
executive conference (MMCONF 150)
station controlled conference (CNF, CNF6, CNF30)
Cut off on disconnect (COD) feature
Database services features
enhanced 800 (E800)
Dialed number identification service (DNIS) feature
Direct dialing overseas (DDO) feature

Table 180 DMS-100 features (Continued)

Feature
Direct inward system access (DISA) feature
Display features
automatic display (AUTODISP)
calling line number display (CLIDSP)
calling name delivery blocking (CNAB)
Calling name display - CENTREX - network - network dial plan display - network name display - networked EBS display
name and reason display (REASDISP)
PX (trunks) calling line identification (PXCLID)
redirecting number and reason delivery (RND) for ISDN call forward
special handling of presentation restricted number (SHPRN)
Distinctive ringing feature (DRING)
Dual line call management (DLCM) feature
Emergency service features
911PREFDN
emergency service line (ESL)
enhanced 911 emergency service (E911)
enhanced 911 PSAP call forward log
E911 ringback
Feature groups
feature group A (FGA)
feature group B (FGB)
feature group C (FGC)
feature group D (FGD)

Table 180 DMS-100 features (Continued)

Feature
Flash ignore (FIG) feature
Hold features
call hold (CHD)
key set music on hold (KSMOH)
Hotline features
automatic dialing (AUD)
automatic line (AUL)
custom IBN disconnect treatment (CDT)
manual line (MAN)
Hunt group features
bridged night number (BNN)
directory number hunt (DNH)
distributed line hunt (DLH)
key-set short hunt group (KSH)
multiline hunt (MLH)
multiple position hunt (MPH)
night service directory number (NSDN)
stop hunt (SHU)
terminating billing option - hunt groups (TRMBOPT)
Hunt group overflow routing features
line overflow to DN (LOD) and line overflow to route (LOR)
Intercept features
flexible intercept (FLEXI)
Intercom features
group intercom (GIC)
group intercom all call (GIAC)

Table 180 DMS-100 features (Continued)

Feature
MBS intercom (ICM)
single party revertive calling (INT)
Interswitch call trace (ICT) and call forwarding enhancement feature
Last number redial (LNR) feature
Local coin overtime (LCO) feature
Local number portability (LNP) feature
Long distance signal (LDS) and toll alert feature
Long distance alert enhancements (LDAE) feature
Messaging features
call screening and monitoring intercept (CSMI)
executive message waiting (EMW)
fax-thru service (FTS)
in-session activation (ISA)
selective call messaging (SCM)
service offering decoupling of SDS (SODS)
special delivery service (SDS)
station message waiting (MWT)
universal voice messaging (UVM)
Multiple appearance directory number features
MADN Cach and Cach Bridging
MADN extension bridging (EXB)
MADN multiple-call arrangement (MCA)
MADN SCA and SCA Bridging
electronic key telephone service (EKTS)
executive busy override on MADN (EBOM)
MADN hold

Table 180 DMS-100 features (Continued)

Feature
MADN lamp (MLAMP)
MADN privacy (PRV) and privacy release (PRL)
MADN release (MREL)
MADN ring forward (MRF)
secondary MADN call forwarding (CFMDN)
MADN MEMDISP and MEMNAME
No double connection (NDC) feature
Network access registers (NAR) feature
O A and M features
customer data change (CDC)
Private virtual networks (PVN) feature
Primary rate interface (PRI) features
ISDN PRI calling name delivery (I-CNAM)
two B channel transfer (TBCT)
RES simultaneous ringing (SimRing) feature
Restrictions to dialing privileges features
authorization codes
authorization code immediate dialing (ACID)
code restriction (CRL)
denied origination feature (DOR)
Restricted dial tone (RSDT) feature
station origination restrictions (SOR)
station specific authorization codes (SSAC)
Ring again features
call back queuing (CBQ)
network ring again (NRAG)

Table 180 DMS-100 features (Continued)

Feature
ring again (RAG)
Routing features
dynamically controlled routing (DCR)
expensive route warning tone (ERWT)
international direct distance dialing (IDDD) through automatic route selection (ARS)
time of day routing (TOD)
Secondary language (SL) feature
Series completion (SCMP) feature
Simplified message desk interface (SMDI) feature
Single line variety package (SLVP) — RES feature
Softkey display (SKDISP) features
softkey transfer (SKDISP)
Speech activated intelligent dialing features
speech activated intelligent dialing (SAID)
SAID stringing of digits (SOD)
Speed calling features
speed call programming
speed call invocation
Suppressed ringing features
suppressed ringing access (SRA)
suppressed ringing for telemetry (UTS)
suppress line identification (SUPPRESS)
Teen service features
teen service (SDN)
secondary directory number identification (SDNID)

Table 180 DMS-100 features (Continued)

Feature
Termination restrictions features
denied incoming (DIN)
denied termination (DTM)
do not disturb (DND)
make busy key (MBK)
make set busy (MSB)
make set busy intragroup (MSBI)
random make busy (RMB)
plug up (PLP)
suspended line (SUS) and requested SUS (RSUS)
Three-way calling features
three-way calling (3WC and consultation hold)
usage sensitive three-way calling (U3WC)
Toll restriction features
carrier toll denial (CTD)
equal access enhanced CTD
interLATA full carrier toll denial (FCTDNTER)
toll denial (TDN)
toll diversion (TDV)
Uniform call distribution (UCD) feature
Virtual facility group features
virtual facility group (VFG) and VFG look ahead (VFGLA)
Wide area telephone service (WATS) features
enhanced WATS access line (EWAL) - outward WATS (OWT) - enhanced outwats (EOW) and universal OWT

21.4 General information

The following sections contain generic AIN interactions information that applies to features documented in the interactions chapters.

21.4.1 AIN distinctive alerting

When the SCP database sends a message, the message can contain parameters ControllingLegTreatment and/or PassiveLegTreatment. Either parameter can determine the ring pattern that is applied to the calling and/or called party. Table 181 “Parameter values and ring patterns” provides the relevant values for these two parameters and the applicable ring patterns.

For AIN, AIN distinctive alerting is applicable to the ControllingLegTreatment or PassiveLegTreatment values (other values are ignored). Applicable values follow:

- alertingOnPattern0Normal
- alertingOnPattern1DistinctiveIntergroup
- alertingOnPattern2DistinctiveSpecial
- alertingOnPattern4ReminderRing
- alertingOff

Table 181 provides parameter values and ring patterns for controlling and passive leg treatments.

Table 181 Parameter values and ring patterns

ControllingLegTreatment or PassiveLegTreatment parameter values	Ring patterns
alertingOnPattern0Normal	Normal alerting is 2 s of ringing and 4 s of silence.
alertingOnPattern1DistinctiveIntergroup	800 ms of ringing, then 400 ms of silence, followed by 800 ms of ringing, and then 4 s of silence.
alertingOnPattern2DistinctiveSpecial	400 ms of ringing, then 200 ms of silence, then 400 ms of ringing, then 200 ms of silence, followed by 800 ms of ringing, and then 4 s of silence.
alertingOnPattern4ReminderRing	Not applicable
other supported values	Normal alerting.

MDC lines and customer groups that are served by an SSP can subscribe to switch-based distinctive ringing. Table 182 provides ring codes and their corresponding ring patterns.

Table 182 Ring codes and ring patterns

Ring code	Ring patterns
1	1.5 s on; 4.5 s off
2	1.5 s on; 0.5 s off; 1.5 s on; 2.5 s off
3	1.5 s on; 0.5 s off; 0.5 s on; 3.5 s off
4	1.5 s on; 0.5 s off; 0.5 s on; 0.5 s off;0.5 s on; 2.5 s off
5	1.5 s on; 0.5 s off; 0.5 s on; 0.5 s off; 1.0 s on; 2.0 s off
6	1.0 s on; 0.5 s off; 1.0 s on; 3.5 s off
7	0.5 s on; 0.5 s off; 0.5 s on; 0.5 s off; 1.0 s on; 3.0 s off
8	0.5 s on; 0.5 s off; 1.0 s on; 0.5 s off; 0.5 s on; 3.0 s off
Note 1: Ringing cadences are compliant with specifications, but the timings are slightly different due to hardware restrictions. ***Note 2:*** Ring code 1 supports alertingOnPattern0Normal. Ring code 6 supports alertingOnPattern1DistinctiveIntergroup. Ring code 7 supports alertingOnPattern2DistinctiveSpecial.	

When the called party is a party line or is served by a peripheral that does not support coded ringing, parameters ControllingLegTreatment and PassiveLegTreatment are disregarded and switch-controlled alerting is applied.

When parameters ControllingLegTreatment or PassiveLegTreatment are present, the corresponding distinctive ringing pattern in the DMS SSP is applied. The distinctive ringing value overrides any switch-based distinctive ringing feature, including the following features:

- distinctive ringing
- CLASS distinctive ringing and call waiting (DRCW)
- teen service

AIN distinctive ringing does not override basic rate interface (BRI) ringing patterns.

21.4.2 AIN distinctive alerting and call waiting

When an AIN call terminates to a busy line and call waiting is applicable to the busy line, a distinctive call waiting tone must be applied when the SCP has sent parameter ControllingLegTreatment or PassiveLegTreatment. Table 183 illustrates the relationship between the ControllingLegTreatment and PassiveLegTreatment parameter values, and the applicable call waiting tone.

Table 183 Distinctive alerting and call waiting tones

ControllingLegTreatment or PassiveLegTreatment	Tone
alertingOnPattern0Normal	300 ms on
alertingOnPattern1DistinctiveIntergroup	100 ms on; 100 ms off; 100 ms on
alertingOnPattern2DistinctiveSpecial	100 ms on; 100 ms off; 100 ms on; 100 ms off; 100 ms on
alertingOnPattern4ReminderRing	Not applicable
Other supported values	300 ms on

For AIN, AIN distinctive alerting features are only applied for the following ControllingLegTreatment or PassiveLegTreatment values:

- alertingOnPattern0Normal
- alertingOnPattern1DistinctiveIntergroup
- alertingOnPattern2DistinctiveSpecial
- alertingOnPattern4ReminderRing
- alertingOff

Other ControllingLegTreatment or PassiveLegTreatment values are ignored.

In order to have access to tones for alertingOnPattern1DistinctiveIntergroup and alertingOnPattern2DistinctiveSpecial, the user must have the appropriate tone circuits datafilled in table STN. The tones that must be datafilled are CWT, ENHCWT1, and ENHCWT2. The enhanced call waiting package must be present in the office in order to use enhanced call waiting tones. When the requested tone is unavailable for any reason, the normal call waiting tone is used.

Note 1: AIN distinctive alerting is not supported for re-alert. Switch-based alerting is applied during the re-alert, irrespective of AIN distinctive alerting.

Note 2: AIN distinctive alerting and call waiting is not supported for Meridian business sets (MBS) or Meridian feature transparency (MFT) sets.

AIN distinctive alerting and call waiting take precedence over all switch-based distinctive ringing or distinctive ringing and call waiting feature, including the following features:

- distinctive ringing
- CLASS distinctive ringing and call waiting (DRCW)
- teen service

21.4.3 Feature precedence between O_CPB and O_NOA and switch-based features

The O_Called_Party_Busy event has precedence over trigger O_Called_Party_Busy and some DMS-100 switch-based features such as special delivery service. The O_No_Answer event has precedence over some DMS-100 switch-based features such as special delivery service.

Trigger O_Called_Party_Busy cannot be detected when an O_CPB event is armed on the same call half. Trigger O_Called_Party_Busy can be detected when the SCP returns a Continue message in response to an O_CPB event.

Note: Multiple extended TCAP transactions (METT) in OCM functionality does not change the way that switched-based features work with NELs.

21.4.4 Feature precedence between T_Busy and T_No_Answer and switched-based features

The T_Busy and T_No_Answer events have precedence over triggers T_Busy and T_No_Answer and DMS-100 switch based terminating features, such as call waiting, call forward busy or call forward don’t answer.

Triggers T_Busy and T_No_Answer cannot be detected when the corresponding terminating event is armed. The triggers can be detected when a continue message is returned from the SCP in response to a T_Busy or T_No_Answer EDP-R.

Triggers T_Busy and T_No_Answer have precedence over terminating switch-based features, such as call waiting or call forward busy.

Triggers T_Busy and T_No_Answer have precedence over switch-based features, such as special delivery service. Switch-based features are only detected when triggers T_Busy and the T_No_Answer are not encountered, or when a continue response is received from the SCP in response to a T_Busy or T_No_Answer TDP-R.

Note: Multiple extended TCAP transactions (METT) in OCM functionality does not change the way that switched-based features work with NELs.

21.4.5 METT in OCM with switched-based features

The METT in OCM feature does not by itself modify the interaction of AIN triggers and events with switch-based features. The OCM-METT feature enhances AIN functionality to allow multiple OCM events to be armed and detected in a call leg.

The behavior of AIN interaction with switch-based features does not change.

Multiple AIN OCM events (instead of one) can be armed before or after a switch based feature is encountered. These multiple OCM event interactions are the same as OCM event interactions with switch-based feature.

When a switch-based feature causes OCM NELs to be closed (for example, AC Night Service feature), one Close_Message is sent for each OCM NEL transaction.

When a switch-based feature allows OCM events to be armed and detected (for example, CFW/CFX), then more than one event can be armed and detected.

21.4.6 Generic addresses

Generic addresses for connected number and broadcast destination features are not sent in the GenericAddressList since they are not specified in GR-1298 and GR-1299.

Only dialed number, destination number, supplemental user provided calling addresses (failed screening or not screened), completion number, ported number, 800 service indicator types of generic addresses are used to populate the GenericAddressList.

21.4.7 AIN interactions with flash features

When an AIN subscriber performs a flash hook while in a call and the user subscribes to call transfer, 3WC or other conference features, the user encounters the Origination_Attempt trigger detection point (TDP). This action is interpreted as an attempt to establish a new call leg. The user can subsequently encounter all originating call model (OCM) and terminating call models (TCM) triggers and events, when the dialed digits initiate a call.

When the user does not subscribe to call transfer, 3WC or other conference features, they are not allowed to establish a new call leg; the user does not encounter the Origination_Attempt TDP. When performing a flash hook in this scenario, the user is allowed to dial the access code to activate another feature (for example, cancel call waiting.)

21.4.8 Feature interactions during routing to the destination

Terminating features on the called party are activated and function the same way as if the call was initiated by the originator through going off-hook and dialing the digits.

21.4.9 AIN interactions with switch-based access codes

Supported features with switch-based vertical service codes (VSCs) with or without dialed digits for a call, escape trigger Off-Hook_Delay. Switch-based feature VSCs are processed in the analyzing information point in call (PIC). When the feature initiates a call, call processing moves to the collecting information PIC with the additional dialed digits and without the VSC digits. Calls of this nature can encounter trigger Off-Hook_Delay (also applies to switch-based feature access codes).

21.4.10 Interactions with Send_To_Resource - IP and switch-based features

Switch-based features are allowed before AIN triggering that results in the send to resource with an intelligent peripheral (STR-IP) connection.

During an STR connection, the call is not in a stable state, therefore, all switch-based features at any of the SSPs involved in the connection, either the originating, intermediate or the IP-connected SSP, are denied.

AIN is also not allowed to re-trigger in a STR connection at any of the SSPs involved in the connection. Any AIN triggering attempts are denied.

Any PRI services requested by the IP are denied.

21.4.11 Interactions between the Collect_Information message and switch-based features

All switch-based features that are activated during translations and routing that are not discussed in the following chapters are denied and sent to final (FNAL) treatment. Switch-based features that activate after translations and routing are permitted.

In general, any per call switch-based name and/or number blocking feature can be activated using the Collect_Information message. AIN presentation status always overrides switch-based display features, even when the switch-based feature is activated by a subscriber or through the Collect_Information message.

21.4.12 Create_Call

21.4.12.1 Interactions with AIN Triggers

When the originator accepts the Create_Call request by going off-hook and routing to the destination, the call can hit an AIN trigger.

21.4.12.1.1 Alerting the Originator

When alerting the originator for a Create_Call request, the SSP ignores all subscribed terminating AIN triggers (for example, TAT and T_No_Answer) and all switched-based features (for example, call forwarding and denied termination). Queries do not go to the SCP.

21.4.12.1.2 Originator Goes Off-hook

When the originator accepts the Create_Call request by going off-hook, the SSP ignores any subscribed AIN triggers at the Orig_Attempt TDP and Info_Collected TDP. Queries do not go to the SCP.

21.4.12.1.3 Routing to the Destination

After the originator goes off-hook, the SSP starts to establish the call by taking up call processing at the Analyze_Information point in call (PIC) of the originating basic call model (BCM). The SSP does not check for triggers nor switched-based features at any TDP that precedes the Analyze_Information PIC and the call can encounter triggers at any TDP after Info_Analyzed. The routing behavior for the Create_Call setup is the same as when the SCP returns an Analzye_Route message with a CalledPartyID.

21.4.12.1.4 TCM triggers

When a call is being established due a Create_Call request from the SCP, TCM triggers will be encountered if the DN specified in the CalledPartyID parameter of the Create_Call message is subscribed to a TCM trigger.

21.4.13 Redirections

Redirections occur when a new call leg is created and termination is attempted.

Redirections include the following functionalities:

- AIN forward call messages
- Analyze_Route messages with redirection parameters
- AIN Analyze_Route messages with public office dial plan attributes (PODPATTR)
- switch-based call forwarding
- Analyze_Route response to an AIN trigger with LARP assigned.

21.5 Incoming and outgoing call memory block

Several CLASS features rely on the contents of the incoming call memory block and outgoing call memory block. Section 21.5.1 and Section 21.5.2 describe how AIN interacts with incoming and outgoing call memory block.

21.5.1 Incoming call memory block

The contents of the incoming call memory block of the terminator are altered when the SCP sends parameter CallingPartyID.

Note: Create_Call has no affect on the incoming call memory block.

Table 184 illustrates the alterations that apply when parameter CallingPartyId is received from the SCP.

Table 184 Incoming call memory block contents

Contents	Values in incoming call memory block
calling DN	When the CallingPartyID is less than or equal to 10 digits, it is stored as the calling DN. When CallingPartyID is greater than 10 digits, it is not stored; the calling DN is marked as unavailable.
network	Network value of PUBLIC is used.
intraoffice call	Intraoffice value of TRUE is used when the CallingPartyID corresponds to a valid DN in the office. A value of FALSE is used otherwise.
interworking encountered	Interworking value of FALSE is used when the CallingPartyID corresponds to a valid DN in the office. A value of TRUE is used otherwise.
originating address info	Value is taken from the nature of number information received in parameter CallingPartyID.
originating name private	The value of TRUE is used when the CallingPartyID received is different from the Calling Party DN of the originating agent.
originating DN private	Based on the presentation restriction indicator in parameter CallingPartyID, the value of FALSE is used when the presentation restriction equals PRESENTATION_ALLOWED; otherwise a value of TRUE is used.
long distance indicator	Value is determined using reverse translations from the called party to the CallingPartyID digits. When it is necessary to dial 1+7 or 1+10 digits to reach the CallingPartyID, the call is marked as long distance.

21.5.2 Outgoing call memory block

The contents of the outgoing call memory block are altered when an interaction with AIN is detected.

Table 185 illustrates the alterations that apply when an interaction with AIN occurs.

Table 185 Outgoing call memory block contents

Contents	Values in the outgoing call memory block
DN Unusable	AIN00018 option is “ON”. During call processing of the initial call, when a call has received a diverting Analyze_Route response, the value of True is used. The same value is used when a Disconnect or Send_to_Resource response is received on the initial call. ***Note:*** A diverting response redirects the call to a calledpartyid that is different than the original calledpartyid. AIN00018 option is “IDLE”. During call processing of the initial call, when an Analyze_Route response is received, the value of True is used. The same value is used when a Disconnect or Send_To_Resource response is received on the initial call.

AIN messages that divert calls (for example, Analyze_Route, Disconnect) currently interact with the CLASS outgoing memory slot (OMS). On an AIN diverted call, the OMS is marked as unreliable due to the diversion. OMS is marked as unreliable so that after a user has interacted with AIN service logic and the call is diverted, the invocation of call re-establishment features (for example, automatic call back) on subsequent calls are blocked.

When an AIN trigger is hit and an Analyze_Route response is returned by the SCP, the DN in the OMS is marked as invalid. When an O_CPB or O_NoA trigger is hit after an Analyze_Route response is received and the escape feature interaction (ESCFI) automatic call back fail (ACBFAIL) criteria is datafilled, the SCP is not queried.

The Collect_Information message is capable of diverting a call to a new destination. When the Collect_Information message diverts a call with routing digits or a feature + routing digits, the OMS’ DN_UNRELIABLE field should be set to indicate that this call has been diverted and the OMS should not be used by subsequent call features (for example, ACB).

The Collect_Information message interaction is designed in the same manner as other AIN diverting messages (for example, Disconnect message). When parameter CollectedDigits contains routing digits (speed call activation code, translatable digits, CNDB code or user dialed routing digits) the AIN ACB blocking utility is invoked to set the OMS’ DN_UNRELIABLE field when the translation results are analyzed by the Collect_Information message. The AIN ACB blocking utility is not invoked when the Collect_Information message activates the ACB feature because ACB activation is permitted with the Collect_Information message. Outgoing call memory block is not marked as unusable when an AutomaticRecall code is received, because the routing digits

used for AutomaticRecall are from the last incoming call and AutomaticRecall updates the OMS when it routes the call.

When a call originates through the Create_Call request, the SSP does not update the outgoing Memory Slot (OMS), whether or not the call is diverted through triggering while routing to the called party.

21.5.3 Display text

For display features, when a CallingPartyID is received in an AIN Forward_Call, Authorize_Termination, Analyze_Route, or Collect_Info response, it can be displayed at the terminator.

Note: Display for calls involving 3WC or call transfer features is not fully supported.

The following list outlines the common interactions for each of the electronic business set (EBS) display features with AIN:

- When the CallingParty DN field in parameter CallingPartyID (sent in an SCP response) is the same as the originating party DN with the presentation restriction indicator field set to presentation_allowed, or parameter CallingPartyID is invalid or absent, then the functionality remains unchanged.
- When the presentation restriction indicator field in parameter CallingPartyID (sent in an SCP response) is set to presentation_restricted and the CallingPartyID DN field is the same as the originating DN, then the originating party DN is not displayed, but the name is displayed.
- When the presentation restriction indicator field in parameter CallingPartyID (sent in an SCP response) is set to presentation_allowed, but a presentation restriction code has been dialed prior to making the call, the presentation_restriction field in the SCP response has precedence over the switch-based restriction. The calling DN is delivered.
- When the presentation restriction indicator field in the SCP response is set to presentation_restricted and the CallingPartyID DN field of parameter CallingPartyID is different from the originating DN, then neither the name or the DN is displayed. The message “OUTSIDE CALL” is displayed.

The following limitations and restrictions apply to all the EBS display features discussed in this document:

- A call that is forwarded as a result of an AIN Forward_Call response is not treated as a forwarded call for display purposes. For example, when name and reason display are assigned, a call that is forwarded by a Forward_Call

response is only displayed as a direct call, that is, no reason information is displayed.

- Parameter RedirectingPartyID in an Analyze_Route response is not displayed for calls within the same office.

21.5.4 Hold Key

The Hold key on a telephone set is independent of AIN and does not affect AIN functionality. For example, When an IP connection is established and the HOLD key is pressed, the IP connection is not affected. When the TSTRC timer expires while the set is in the HOLD state, the IP connection is taken down and AIN processing continues and a Resource_Clear message (clearCause = ipTimeout) is sent to the SCP.

21.5.5 ExtendedRinging and switch-based features

Extended Ringing does not change/affect the called name and number displayed on the terminator's set. Hook flashes by the subscriber during ExtendedRinging are ignored.

21.5.6 Serial triggering

The serial triggering counter is kept on a per "call leg" basis; that is, TCM triggers are counted along with OCM triggers. However, the counter is reset to 0 (zero) on forwarding. EDP-R and trigger queries are both included in the same counter. The LNP query is included in the counter.

When the SSP detects a TRA trigger, the serial trigger count increments and the SSP sends a request message to the SCP. When the serial trigger count exceeds the MAX_SERIAL_TRIGGER_COUNT (defined in table OFCENG), the SSP does not send a TRA query. The call processes as normal from the next point in call and the terminator is alerted.

21.5.7 Trigger TRA and message Update

Message Update allows the SCP to activate or deactivate trigger subscriptions, including trigger TRA. Using the TriggerItemID and SSPUserResourceID contained in a TriggerItemAssignment, the SCP can set the appropriate trigger to the value of the ActivationStateCode. The ActivationStateCode can be ON or OFF. When the state for trigger TRA is ON, the trigger can be detected. When the state for trigger TRA is OFF, the trigger can not be detected.

22 AIN/DMS-100 interactions (A and B)

WARNING
Limited information source
The status of each feature (documented in the interactions chapters) is provided as an indicator. Please read all information associated with each feature.

AIN interacts with many DMS-100 switch features. The purpose of this chapter is to document interactions between various AIN functionalities (for example, intra-AIN interactions). The feature interactions chapters are arranged alphabetically into five chapters. This chapter describes the interactions for features that begin with the letters A and B.

Note: See Chapter 21: "AIN interactions introduction" on page 717 to learn how to use this information.

22.1 Analog display services interface features

This section describes the features that follow:

- spontaneous call waiting identification (SCWID)
- spontaneous call waiting identification with disposition (DSCWID)

22.1.1 Spontaneous call waiting identification

SCWID delivers calling party information to custom local area signaling service (CLASS) display subscribers when a call is waiting.

When a SCWID subscriber has the calling number delivery and calling name delivery features, during call wait alerting, the subscriber receives the calling name and number of the waiting call.

SCWID can interact with the AIN feature for residence enhanced services (RES) lines and integrated business network (IBN) lines.

22.1.1.1 Trigger interactions with SCWID

Table 186 provides trigger interactions with SCWID.

Table 186 Trigger interactions with SCWID

Trigger	Status	Interactions
AFR	S	A call that hits these triggers can terminate to a SCWID subscriber.
CDP	S	
International	S	
N11	S	
O_CPB	S	For intraswitch and interswitch calls, interactions are the same as call waiting (CWT).
O_NoA	S	
OHD	S	A call that hits these triggers can terminate to a SCWID subscriber.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	The precedence between trigger T_Busy and SCWID is identical to the one between trigger T_Busy and CWT. SCWID is activated as CWT when a continue or Offer_Call response is received for a T_Busy query.
T_NoA	UU	Not applicable
TAT	S	A call that subscribes to this trigger can terminate to a SCWID subscriber.
TRA	S	The precedence between trigger TRA and SCWID is the same as the precedence between trigger TRA and CWT. See CWT. Trigger TRA has precedence over SCWID. The call can encounter SCWID after a Continue response from trigger TRA.

22.1.1.2 Event interactions with SCWID

Table 187 provides event interactions with SCWID.

Table 187 Event interactions with Spontaneous call waiting identification

Event	Status	Interactions
Network_Busy	UU	Not applicable
O_Answer	UU	Not applicable
O_CPB	UU	Not applicable
O_NoA	UU	Not applicable
T_Answer	UU	Not applicable
T_Busy	S	When the response is an Offer_Call or Continue message, SCWID activates.
T_NoA	UU	Not applicable

22.1.1.3 Other interactions with SCWID

Table 188 provides other interactions with SCWID.

Table 188 Other interactions with SCWID

Description	Status	Interactions
CallingPartyID	S	This parameter can alter the display of the terminator.
ControllingLegTreatment	PS	These parameters can alter the ringing or alerting patterns applied to the terminating ADSI phone.
PassiveLegTreatment	PS	
DisplayText	S	When an Offer_Call or Authorization_Termination message contains AIN DisplayText, the calling number and calling name (when contained in DisplayText) displays on the CPE of the terminator (while call waiting is in effect).
ExtendedRinging	S	ER and SCWID interact in the same manner as ER and CWT. See Chapter 23.6.1: “Call waiting” on page 857.
Create_Call	S	When Create_Call alerts the originator, SCWID can not activate on a subsequent incoming call. When Create_Call determines that the originator is busy, SCWID can not activate.

22.1.2 SCWID with disposition

DSCWID provides the same capabilities as the SCWID feature with the added ability to control the treatment applied to incoming waiting calls. Upon

notification of the second incoming call, the subscriber can perform the following tasks:

- answer the new call by placing the existing call on hold
- disconnect the existing call and answer the new call
- forward the new call
- connect the new call to a busy announcement
- put the new call on hold after connecting to a hold announcement
- or conference the new call with the existing call

DSCWID can interact with the AIN feature for RES and IBN lines.

22.1.2.1 Trigger interactions with SCWID with disposition

Table 189 provides trigger interactions with SCWID with disposition.

Table 189 Trigger interactions with SCWID with disposition

Trigger	Status	Interactions
AFR	S	An agent that subscribes to these triggers can terminate to a DSCWID subscriber.
CDP	S	
International	S	
N11	S	
O_CPB	S	For intraswitch and interswitch calls, interaction are the same as with the CWT feature, except in the specific call scenario where the terminating agent has subscribed to DSCWID, received a second call, and pressed the preset “busy” option to avoid answering the second call. For DSCWID, trigger O_Called_Party_Busy is not detected when the preset “busy” option is datafilled to an announcement. The originating agent receives an announcement when the terminating agent, rather than answer the second call, presses the preset “busy” button. When no announcement is datafilled to the preset “busy” option, the call hits trigger O_Called_Party_Busy.

Table 189 Trigger interactions with SCWID with disposition (Continued)

Trigger	Status	Interactions
O_NoA	S	For intraswitch and interswitch calls, interaction is the same as with the CWT feature, except in the specific call scenario where the terminating agent has subscribed to DSCWID, received a second call, and pressed the preset 'busy' option to avoid answering the second call. For DSCWID, trigger O_No_Answer is not hit when the preset 'busy' option is datafilled to an announcement. The originating agent receives an announcement when the terminating agent, (rather than answer the second call) presses the preset 'busy' button.
OHD	S	An agent that subscribes to these triggers can terminate to a DSCWID subscriber.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	The precedence between trigger T_Busy and DSCWID is identical to the one between trigger T_Busy and CWT. DSCWID is activated similar to CWT, when a Continue or Offer_Call response message is received for a T_Busy query.
T_NoA	UU	Not applicable
TAT	S	An agent that subscribes to this trigger can terminate to a DSCWID subscriber.
TRA	S	For trigger TRA, DSCWID behaves the same as SCWID. See SCWID.

22.1.2.2 Event interactions with SCWID with disposition

Table 190 provides event interactions with SCWID with disposition.

Table 190 Event interactions with SCWID with disposition

Event	Status	Interactions
Network_Busy	UU	Not applicable
O_Answer	UU	
O_CPB	UU	
O_NoA	UU	
T_Answer	UU	
T_Busy	S	When Offer_Call or Continue is the response, DSCWID activates.
T_NoA	UU	Not applicable

22.1.2.3 Other interactions with SCWID with disposition

Table 191 provides other interactions with SCWID with disposition.

Table 191 Other interactions with SCWID with disposition

Description	Status	Interactions
CallingPartyID	S	This parameter can alter the display of the terminator.
ControllingLegTreatment	PS	These parameters can alter the ringing or alerting patterns applied to the terminating ADSI phone.
PassiveLegTreatment	PS	
DisplayText	S	When an Offer_Call or Authorization_Termination message contains AIN DisplayText, the calling number and calling name (when contained in DisplayText) displays on the CPE of the terminator (while call waiting is in effect).

Table 191 Other interactions with SCWID with disposition (Continued)

Description	Status	Interactions
ExtendedRinging	S	The ER feature applies (when applicable) to a DSCWID subscriber, until the subscriber selects one of the DSCWID disposition options. When an option is selected, ER handles the call as though the called party answered. The calling and called party are re-connected, ER is removed, and DSCWID takes control of the call.
Create_Call	S	When Create_Call alerts the originator, DSCWID cannot activate on a subsequent incoming call. When Create_Call determines that the originator is busy, DSCWID can not activate.

22.2 Automatic call distribution features

Automatic call distribution (ACD) permits calls to be evenly distributed to a number of designated ACD agent positions. When all positions are busy, new calls are queued and a ringing tone or announcement can be returned to the caller.

Calls cannot originate from an ACD DN.

This section describes the following ACD features:

- ACD call forcing
- ACD InCalls key
- ACD transfer to InCalls key
- ACD login
- ACD login enhancement
- ACD logout
- ACD terminations

22.2.1 ACD call forcing

The call forcing feature has been developed to speed up the processing of ACD calls. It allows incoming ACD calls to be answered without the need of pressing the InCalls key.

ACD call forcing has the same interactions with AIN as ACD terminations. See Section 22.2.7 “ACD terminations” on page 759.

22.2.2 ACD InCalls key

The InCalls key assigned to an electronic business set (EBS) or a Meridian feature transparency (MFT) set is required as part of the ACD package. When an ACD position is selected to receive an ACD call, the call is presented to an ACD position through the InCalls key. The InCalls key lamp flashes and can be pressed to answer the call.

ACD InCalls Key has the same interactions with AIN as ACD terminations. See Section 22.2.7 “ACD terminations” on page 759.

22.2.3 ACD transfer to InCalls key

This feature allows an ACD call to be transferred by an ACD agent to another ACD agent’s INCALLS key within the same customer group. The transferred call is presented directly to the agent’s INCALLS key when the agent is idle. Otherwise, the transferred call is enqueued on the ACD call transfer priority queue (CTQ), and is presented to the agent when the agent becomes idle, before any other calls that are in the ACD call queue. The CTQ shares the total queue slots (MAXCQSIZ) assigned to the ACD group. The call transfer queue size (CTQSIZE) is defined in table ACDGRP.

Note 1: During ACD transfer to InCalls key recall, no AIN triggers are hit.

Note 2: AIN involvement in the original call does not affect the ability of the ACD agent to activate ACD transfer to InCalls key.

Note 3: Triggers on the originator or the original call are never encountered during an ACD transfer to incalls key.

Note 4: A transfer to an MSB (logged out) ACD agent results in BUSY treatment, whether or not AIN is involved in the call (this is normal ACD behavior).

Note 5: A transfer to an agent that is busy and has a full CTQ, results in BUSY treatment, whether or not AIN is involved in the call (this is normal ACD behavior).

Note 6: The term controller is used to denote the ACD agent who is activating the ACD transfer to Incalls key feature.

22.2.3.1 Trigger interactions with ACD transfer to InCalls key

Table 192 provides trigger interactions with ACD transfer to InCalls key.

Table 192 Trigger interactions with ACD transfer to the InCalls key

Trigger	Status	Interactions
AFR	S	These triggers can be hit on the transferred call leg by the agent performing the ACD transfer
CDP	S	
International	S	
N11	S	
O_CPB	S	Trigger O_CPB is not hit when the terminator is busy and the CTQ is not full. Trigger O_CPB is hit when one of the following conditions is met: • the terminator is busy and the CTQ is full • the terminator has MSB activated (i.e. is logged out) • the terminator is busy, and there is no CTQ defined
O_NoA	S	Whenever the transferred call is placed in the CTQ, the O_NoA trigger timer starts as soon as the call is placed in the CTQ. Whenever the call is not placed in the CTQ, the O_NoA trigger timer starts as soon as the call terminates on the transfer-to agent. Depending on when the O_NoA trigger timer expires and whether the call is still in the CTQ or not, trigger O_NoA can be hit while the call is in the CTQ or being presented to the terminator. Trigger O_NoA can be hit after the controller bridges the call (for example, when a conference call is established). Trigger O_NoA is deactivated (for example, not hit) when the controller leaves the call.
OHD	S	These triggers can be hit on the transferred call leg by the agent performing the ACD transfer.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	NA	ACD is not supported on PRI agents.
SDS	S	These triggers can be hit on the transferred call leg by the agent performing the ACD transfer.
SFC	S	

Table 192 Trigger interactions with ACD transfer to the InCalls key

Trigger	Status	Interactions
SIT	NA	ACD is not supported on trunk agents.
Specified_Carrier	S	This trigger can be hit on the transferred call leg by the agent performing the ACD transfer.
T_Busy	UU	Trigger T_Busy is not supported (is not hit) during an ACD transfer.
T_NoA	PS	Whenever the transferred call is placed in the CTQ, the T_NoA trigger timer is started as soon as the call is placed in the CTQ. Whenever the call is not placed in the CTQ, the T_NoA trigger timer is started as soon as the call terminates on the transfer-to agent. Depending on when the T_NoA trigger timer expires and whether the call is still in the CTQ or not, trigger T_NoA can be hit while the call is in the CTQ or being presented to the terminator. Trigger T_NoA can be hit during the ACD call transfer (as long as there is room in the CTQ or the transfer-to agent is idle). Trigger T_NoA is deactivated as soon as the call is bridged or the controller leaves the call.
TAT	S	The TAT trigger can be hit on the transferred leg of the call. When the call is placed in the CTQ, TAT is hit before being placed in the CTQ, but not afterwards.
TRA	S	During ACD transfer to InCalls key recall, the call does not encounter trigger TRA. On the transferred leg of the call, trigger TRA can be encountered when there is room in CTQ or when the transfer-to-agent is idle. After being placed in CTQ, trigger TRA can not be encountered again when the agent becomes idle.
TKTERM	N/A	

22.2.3.2 Event interactions with ACD transfer to InCalls key

Table 193 provides event interactions with ACD transfer to the InCalls key.

Table 193 Event interactions with ACD transfer to InCalls key

Event	Status	Interactions
Network_Busy	S	This event can be armed and detected on the transferred call leg, by the agent performing the transfer to incalls key.
O_Answer	S	This event can be armed and detected on the transferred call leg (whether the call is placed in the CTQ or not and whether the controller bridges the call), by the agent performing the transfer to incalls key. However, the O_answer event is closed whenever the controller leaves the call (close cause = Callterminated).
O_CPB	S	The O_CPB event is not hit when the terminator is busy and the CTQ is not full. The O_CPB event is hit when: • the terminator is busy and the CTQ is full • the terminator has MSB activated (for example, is logged out) • the terminator is busy, and there is no CTQ defined
O_NoA	S	Whenever the transferred call is placed in the CTQ, the O_NoA event timer is started as soon as the call is placed in the CTQ. Whenever the call is not placed in the CTQ, the O_NoA event timer is started as soon as the call terminates on the transfer-to agent. Depending on when the O_NoA event timer expires and whether the call is still in the CTQ or not, the O_NoA event can be hit while the call is in the CTQ or being presented to the terminator. Trigger O_NoA can be hit after the controller bridges the call (for example, a conference call is established). Trigger O_NoA is closed when the controller leaves the call.
T_Answer	PS	This event can be armed and detected on the transferred call leg (whether the call is placed in the CTQ or not), by the agent performing the transfer to incalls key. However, the T_answer event is closed whenever the controller bridges (close cause = EDPscompleted) or leaves the call (close cause = Callterminated).
T_Busy	PS	The T_Busy event is not supported (for example, it is never detected) during an ACD transfer.

Table 193 Event interactions with ACD transfer to InCalls key (Continued)

Event	Status	Interactions
T_NoA	PS	Whenever the transferred call is placed in the CTQ, the T_NoA event timer is started as soon as the call is removed from the CTQ. Whenever the call is not placed in the CTQ, the T_NoA trigger timer is started as soon as the call terminates on the transfer-to agent. The T_NoA event can be detected during the ACD call transfer (as long as there is room in the CTQ or the transfer-to agent is Idle). The T_NoA event is closed as soon as the call is bridged or the controller leaves the call.
O_Disconnect	PS	When the call lands on ACD DN, or is put into a queue, O_Disconnect NEL will be closed with closecause of “eDPsCompleted”.
O_Disconnect_Called	PS	When the call lands on ACD DN, or is put into a queue, O_Disconnect_Called NEL will be closed with closecause of “eDPsCompleted”.
Timeout	PS	When the call lands on ACD DN, or is put into a queue, CPH NEL will be closed with closecause of “eDPsCompleted”.
TKTERM	N/A	

22.2.3.3 Other interactions with ACD transfer to InCalls key

Table 194 provides other interactions with ACD transfer to the InCalls key.

Table 194 Other interactions with ACD transfer to InCalls key

Description	Status	Interactions
Continue	S	When these responses are received during an ACD transfer to InCalls key, there is no impact on the ACD transfer functionality.
CollectInfo	S	
AnalyzeRoute	S	
ForwardCall	S	

Table 194 Other interactions with ACD transfer to InCalls key (Continued)

Description	Status	Interactions
DisplayText	PS	A display text parameter received during the initial call leg is not displayed on the transfer-to agent's set (for example, the second call leg). A display text parameter received during the second call leg, interacts as follows: • When the transfer-to agent is an EBS set with the ACD option, the AIN display text is not displayed on the set. • When the transfer-to agent is an IBN set, the AIN display text data is displayed, but can be changed when — the controller bridges before the terminator answers and the terminator's display is updated with the controller's DN — the controller transfers (by hanging up) before the terminator answers and the terminator's display is not updated (still shows DT information) — the controller bridges after being placed in the terminator's CTQ and is presented to the terminator and the AIN display text is not displayed — the controller transfers (by hanging up) after being placed in the terminator's CTQ, is presented to the terminator and the AIN display text is not displayed — the controller bridges or transfers the call after the terminator has answered and the terminator's display is not updated

Table 194 Other interactions with ACD transfer to InCalls key (Continued)

Description	Status	Interactions
CallingPartyId	PS	A callingpartyid parameter received during the initial call leg is not displayed on the transfer-to agent's set (for example, the second call leg). A callingpartyid parameter received during the second call leg interacts as follows: • When the transfer-to agent is an EBS set with the ACD option, the AIN callingpartyid is not displayed on the set. • When the transfer-to agent is an IBN set, the AIN callingpartyid is displayed, but can be changed when — the controller bridges before the terminator answers and the terminator's display is updated with the controller's DN — the controller transfers (by hanging up) before the terminator answers and the terminator's display is not updated (still shows AIN callingpartyid) — the controller bridges after being placed in the terminator's CTQ and is presented to the terminator and the AIN callingpartyid is not displayed — the controller transfers (by hanging up) after being placed in the terminator's CTQ, is presented to the terminator and the AIN callingpartyid is not displayed — the controller bridges or transfers the call after the terminator has answered, the terminator's display is not updated
Create_Call	S	When the CallingPartyID is an ACD DN, the Create_Call request is rejected by sending the SCP a failure message with failureCause=inappropriateUserInterface.

22.2.4 ACD login

ACD login allows an ACD agent to login to an ACD group. Once that ACD agent is logged in, the agent can receive ACD calls. To login, the INCALLS key is pressed or the agent goes off hook. When the special dial tone is heard, the agent can login by dialing a four digit number.

22.2.4.1 Trigger interactions with ACD login

Table 195 provides trigger interactions with ACD login.

Table 195 Trigger interactions with ACD login

Trigger	Status	Interactions
AFR	S	During ACD login, the call cannot hit these triggers.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	When an agent is required to enter a feature access code in order to login, this trigger takes precedence, preventing the agent from logging in. All subsequent triggers and events can be encountered.
One_Plus_Prefix	S	During ACD login, the call cannot hit these triggers.
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	During ACD login, the call does not encounter trigger TRA.
TKTERM	N/A	

22.2.4.2 Event interactions with ACD login

Table 196 provides event interactions with ACD login.

Table 196 Event interactions with ACD login

Event	Status	Interactions
Network_Busy	S	Because there are no triggers encountered during ACD login, no events can be armed or detected.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

22.2.5 ACD login enhancement

ACD login enhancement allows an ACD agent to login to an ACD group with a login ID and corresponding password (as opposed to an ACD login, that requires a login ID only). Once the agent is logged in, the agent can receive ACD calls.

22.2.5.1 Trigger interactions with ACD login enhancement

Table 197 provides trigger interactions with ACD login enhancement.

Table 197 Trigger interactions with ACD login enhancement

Trigger	Status	Interactions
AFR	S	During ACD login enhancement, these triggers cannot be hit.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	When an agent is required to enter a feature access code in order to login, this trigger takes precedence, preventing the agent from logging in. Subsequent triggers and events can be encountered.

Table 197 Trigger interactions with ACD login enhancement (Continued)

Trigger	Status	Interactions
One_Plus_Prefix	S	During ACD login enhancement, these triggers cannot be hit.
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	During ACD login (enhancement), the call does not encounter trigger TRA.
TKTERM	N/A	

22.2.5.2 Event interactions with ACD login enhancement

Table 198 provides event interactions with ACD login enhancement.

Table 198 Event interactions with ACD login enhancement

Event	Status	Interactions
Network_Busy	S	Because there are no triggers encountered during ACD login enhancement, no events can be armed or detected.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

22.2.6 ACD logout

The ACD logout feature allows an ACD agent, when logged into an ACD group, to log out. When logged out, the agent position no longer receives ACD calls.

22.2.6.1 Trigger interactions with ACD logout

Table 199 provides trigger interactions with ACD logout.

Table 199 Trigger interactions with ACD logout

Trigger	Status	Interactions
AFR	S	During ACD logout, these triggers cannot be hit.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	When an agent is required to enter a feature access code in order to logout, this trigger takes precedence, preventing the agent from logging out. Subsequent triggers and events can be encountered.
One_Plus_Prefix	S	During ACD logout, these triggers cannot be hit.
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	

Table 199 Trigger interactions with ACD logout (Continued)

Trigger	Status	Interactions
TRA	S	During ACD logout, the call does not encounter trigger TRA.
TKTERM	N/A	

22.2.6.2 Event interactions with ACD logout

Table 200 provides event interactions with ACD logout.

Table 200 Event interactions with ACD logout

Event	Status	Interactions
Network_Busy	S	Because there are no triggers encountered during ACD logout, no events can be armed or detected.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

22.2.7 ACD terminations

The following section describes how calls to ACD DNs interact with AIN.

22.2.7.1 Trigger interactions with ACD terminations

Table 201 provides trigger interactions with ACD terminations.

Table 201 Trigger interactions with ACD terminations

Trigger	Status	Interactions
AFR	S	ACD agents cannot originate calls on the ACD DN, therefore, these triggers are not hit on ACD originated calls. A call that hits these triggers can terminate on an ACD DN and the ACD functionality is not impacted.
CDP	S	
International	S	
N11	S	
Note: When an MBS or MFT ACD agent is logged out, direct calls to that agent are sent to treatment. This is an ACD limitation. Calls work properly and are not sent to treatment for ACD agents on 2500/500 sets. This ACD limitation applies when AIN is involved in the call.		

Table 201 Trigger interactions with ACD terminations (Continued)

Trigger	Status	Interactions
O_CPB	PS	For intraswitch and interswitch calls, this trigger it not detected when the call terminates on an ACD DN. ACD functionality is not impacted.
O_NoA	PS	For intraswitch calls, this trigger is not detected when the call terminates on an ACD DN. ACD functionality is not impacted. For interswitch calls, this trigger is detected when the call terminates on an ACD DN. ACD functionality is not impacted.
OHD	S	ACD agents cannot originate calls on the ACD DN, therefore, these triggers are not hit on ACD originated calls. A call that hits these triggers can terminate on an ACD DN and the ACD functionality is not impacted.
OHI	S	
One_Plus_Prefix	S	
Operator_services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	U	These triggers cannot be provisioned on an ACD DN, and therefore cannot be hit when the call terminates on an ACD DN. These triggers can be subscribed to by agents in the ACD group, but will not be encountered when dialing the ACD DN. They are encountered when dialing the ACD agent directly.
T_NoA	U	
TAT	U	
TRA	S	No interaction. The ACD DN can not subscribe to trigger TRA.
TKTERM	N/A	
Note: When an MBS or MFT ACD agent is logged out, direct calls to that agent are sent to treatment. This is an ACD limitation. Calls work properly and are not sent to treatment for ACD agents on 2500/500 sets. This ACD limitation applies when AIN is involved in the call.		

22.2.7.2 Event interactions with ACD terminations

Table 202 provides event interactions with ACD terminations.

Table 202 Event interactions with ACD terminations

Event	Status	Interactions
Network_Busy	S	A call that terminates on an ACD DN can previously have armed and detected this event.
O_Answer	PS	When this event is armed and the call terminates on an ACD DN, a close message (with a CloseCause of EDPsCompleted) is sent to the SCP.
O_CPB	PS	
O_NoA	PS	
T_Answer	U	Terminating triggers cannot be assigned to an ACD DN, therefore, terminating events cannot be armed.
T_Busy	U	
T_NoA	U	

22.2.7.3 Other interactions with ACD terminations

Table 203 provides other interactions with ACD terminations.

Table 203 Other interactions with ACD terminations

Description	Status	Interactions
Analyze_Route	S	A call can route to an ACD DN using the Analyze_Route response without impacting ACD functionality.
Collect_Information	S	
Forward_Call	S	
CallingPartyID	PS	Parameter CallingPartyId in an AIN response is not used to update the display of EBS sets with the ACD option.
Create_Call	S	The Create_Call request can route a call to an ACD DN without impacting ACD functionality.

22.2.8 Bearer capability

Bearer capability determines the type of transmission service that is accessible to the user.

22.2.8.1 Trigger interactions with bearer capability

Table 204 provides trigger interactions with Bearer capability.

Table 204 Trigger interactions with bearer capability

Trigger	Status	Interactions
AFR	S	See Table 204 on page 762 for interactions between AIN and bearer capability.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	The TRA query message contains parameter BearerCapability (BC). The value of BC depends on the originating agent of the call that encounters the trigger. AIN response processing does not alter the BearerCapability of the call.
TKTERM	S	

22.2.8.2 Event interactions with bearer capability

Table 205 provides event interactions with bearer capability.

Table 205 Event interactions with bearer capability

Event	Status	Interactions
Network_Busy	S	See Table 206 “Other interactions with bearer capability” for interactions with AIN.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

22.2.8.3 Other interactions with bearer capability

Table 206 provides other interactions with bearer capability.

Table 206 Other interactions with bearer capability

Description	Status	Interactions
AIN response processing	S	The BearerCapability of the call is not altered by AIN response processing. The BearerCapability routing characteristic is maintained.
Bearer capability	S	Parameter bearer capability contains the BearerCapability of the call. This is a mandatory parameter in all outgoing messages, including AIN query messages. The value of the BC used in the AIN query depends upon the originating agent of the call that encounters this trigger.

Table 206 Other interactions with bearer capability (Continued)

Description	Status	Interactions
Monitor_For_Change request (for lines/hunt groups)	S	When parameter BearerCapability is null (not included) in the Monitor_Resource message, the feature immediately checks the physical state of the hunt group. When parameter BearerCapability is present in the Monitor_Resource message, a check is made to determine whether the BearerCapability is valid for the specified agent. For an analog hunt group, the only valid BearerCapability is Speech. When the BearerCapability is not valid for the specified agent, a Status_Reported message is sent to the SCP with the FailureCause parameter set to unavailableResources and the feature processing terminates. When the BearerCapability is valid for the specified agent, feature processing continues to consider the applicability of switch-based features.
Create_Call	S	Create_Call supports 3.1 kHz and speech only.

22.2.8.4 Miscellaneous information for bearer capability

Table 207 describes the bearer capability determination by agent.

Table 207 Bearer capability determination by agent

Originating agent	Incoming bearer capability
POTS line	office default bearer capability (table OFCENG)
IBN line	The bearer capability value set by the BC feature (when applicable); otherwise, the office default bearer capability.
non-SS7 trunk	The bearer capability assigned to the trunk group (when present in table TRKGRP); otherwise, the office default bearer capability.
ISUP and PRI trunk	The bearer capability in the incoming SETUP message (mandatory).
MBS	Office default bearer capability (table OFCENG).
MFT	
BRI	The bearer capability in the incoming SETUP message (mandatory).

Table 208 describes the BearerCapability value in an AIN query.

Table 208 BC value in AIN query

Incoming bearer capability	AIN bearer capability
Speech	Speech

Table 208 BC value in AIN query (Continued)

Incoming bearer capability	AIN bearer capability
3.1 kHz audio	f31kHzaudio
7kHz	f7kHzaudio
unrestricted digital information with rate adaptation	b56kbps
unrestricted digital information without rate adaptation	b64kbps
restricted data unit	Not applicable

22.3 Basic rate interface features

This section addresses the following BRI features.

- additional call offering unrestricted (ACOU)
- additional functional call (AFC)
- block called number (BLOCKCDN)
- block calling number (BLOCKCGN)
- flexible calling (FC)

22.3.1 ACOU

Additional call offering unrestricted (ACOU) is assigned to a DN on a basic rate access functional set (BRAFS) agent to present incoming calls to idle AFC keys, when the single functional call (SFC) key is not available.

ACOU informs an ISDN user of an incoming call when the call would normally be cleared because the ISDN user's interface is busy.

22.3.1.1 Trigger interactions with ACOU

Table 209 provides trigger interactions with ACOU.

Table 209 Trigger interactions with ACOU

Trigger	Status	Interactions
AFR	S	This trigger can be hit on a call that terminates to an ACOU subscriber.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	Trigger T_Busy has precedence over ACOU. A call can encounter ACOU following a Continue or Offer_Call response from a T_Busy query, when the conditions specific to ACOU are met.
T_NoA	S	This trigger can be hit on a call that terminates to an ACOU subscriber.
TAT	S	A call that hits this trigger can encounter ACOU. ACOU functionality is not affected.

Table 209 Trigger interactions with ACOU (Continued)

Trigger	Status	Interactions
TRA	S	Trigger TRA can be encountered for an ISDN BRI line with Additional Call Offering Unrestricted (ACOU) when additional calls can be offered. A call can encounter ACOU following a Continue response from a TRA query. For a terminator subscribed to trigger T_Busy (or when a T_Busy EDP-R is armed), TRA or ACOU, the T_Busy trigger/EDP-R has precedence over trigger TRA. Upon receiving a Continue/OfferCall response for the T_Busy trigger/EDP-R, the call will encounter trigger TRA when the call can be offered. Upon receiving a Continue response from trigger TRA, the call will encounter ACOU.
TKTERM	N/A	

22.3.1.2 Event interactions with ACOU

Table 210 provides event interactions with ACOU follow.

Table 210 Event interactions with ACOU

Event	Status	Interactions
O_Disconnect	S	The ISDN agent considers each call which terminates to an ISDN AFC key via ACOU as a separate call, which is independent of any other calls on AFC keys on that ISDN agent. The standard CPH behavior for each event applies to each of these individual calls.
O_Disconnect_Called	S	
Timeout	S	
Network_Busy	S	A call that arms and detects this event can encounter ACOU.
O_Answer	S	This event can be encountered when the call terminates to a line with ACOU.
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	Event T_Busy has precedence over ACOU. A call can encounter ACOU following a Continue or Offer_Call response from a T_Busy query when the conditions specific to ACOU are met.
T_NoA	S	This event can be encountered when the call terminates to a line with ACOU.

22.3.1.3 Other interactions with ACOU

Table 211 provides other interactions with ACOU.

Table 211 Other interactions with ACOU

Description	Status	Interactions
Offer_Call	S	It is possible to offer the call when there is an idle call appearance on the DN and the NBL is not exceeded.
Continue	S	
DisplayText	S	When the SSP receives an Authorize_Termination or an Offer_Call response message that contains DisplayText information, the display text information is displayed on the called party's CPE once the call is accepted.
ExtendedRinging	S	A call that is routed to an ACOU subscribed line can encounter O_NoA and invoke ER functionality, when applicable.
Monitor_For_Change request for lines	S	When AFC is assigned and the ACOU feature package is present, the status of a non EKTS line is considered idle when the B channel is available. For an EKTS line ACOU is ignored.

22.3.2 AFC

Additional functional call (AFC) is a feature on BRI agents that allows up to five concurrent active calls on a single functional call (SFC) DN.

22.3.2.1 Trigger interactions with AFC

Table 212 provides trigger interactions with AFC.

Table 212 Trigger interactions with AFC

Trigger	Status	Interactions
AFR	S	Calls originated by AFC DNs can hit these triggers.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	Calls originated by AFC DNs can encounter trigger TRA.
TKTERM	N/A	

22.3.2.2 Event interactions with AFC

Table 213 provides event interactions with AFC.

Table 213 Event interactions with AFC

Event	Status	Interactions
O_Disconnect	S	The ISDN agent considers the calls originated from individual AFC keys as separate calls independent of any other calls on AFC keys on that ISDN agent. The standard behavior for each CPH event applies to each of these individual calls.
O_Disconnect_Called	S	
Timeout	S	
Network_Busy	S	Calls originated by AFC DNs can arm or detect these events.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

22.3.2.3 Other interactions with AFC

Table 214 provides other interactions with AFC.

Table 214 Other interactions with AFC

Description	Status	Interactions
DisplayText	S	When AFC is used with EKTS, AIN display text behaves as follows: • When there are no existing calls on the terminator, the AIN display text information is displayed as soon as the call is presented to the terminator. • When there is an existing unanswered call on the terminator, and a subsequent call comes in, the existing display is replaced with the AIN display text information of the second call (as soon as the second call arrives). • When there is an existing answered call on the terminator, and a subsequent call comes in, the AIN display text for the second call is not displayed until the second call is answered.
Monitor_For_Change request for lines	S	When AFC is assigned and the ACOU feature package is not present, a line is considered idle when the line is hardware idle or there is at least one idle AFC key; otherwise the line is considered to be call reference busy.

22.3.3 Block called number

The block called number (BLOCKCDN) option blocks the delivery of the called party number (CDN) information element in the SETUP message. When the BLOCKCDN option is assigned to an ISDN set, calls can no longer terminate to that set. The ISDN set becomes an originate-only set. All calls to a DN with the BLOCKDN option assigned, receive a busy signal.

22.3.3.1 Other interactions with BLOCKCDN

Table 215 provides other interactions with BLOCKCDN.

Table 215 Other interactions with BLOCKCDN

Description	Status	Interactions
DisplayText	S	When the SSP receives an Authorize_Termination or an Offer_Call response message that contains DisplayText information, the display text information is not delivered to an ISDN BRI NI1/NI2 agent's CPE because the call is blocked and is not terminated on the agent.

22.3.4 Block calling number

The block calling number (BLOCKCGN) option blocks the delivery of the calling party number (CGN) information element in the SETUP message. The BLOCKCGN option controls delivery of the CGN at the terminating end. Assigning the BLOCKCGN option to a user, prevents the CGN from being displayed to that user.

22.3.4.1 Other interactions with BLOCKCGN

Table 216 provides other interactions with BLOCKCGN.

Table 216 Other interactions with BLOCKCGN

Description	Status	Interactions
DisplayText	S	When the SSP receives an Authorize_Termination or an Offer_Call response message that contains display text callingAddress information, the display text information is not delivered to an ISDN BRI NI1/NI2 agent's CPE.

22.3.5 FC

Flexible calling (FC) is a set of capabilities that allow ISDN users to establish and control two or more concurrent calls.

22.3.5.1 Trigger interactions with FC

Table 217 provides trigger interactions with FC.

Table 217 Trigger interactions with FC

Trigger	Status	Interactions
AFR	PS	This trigger is encountered on subsequent FC call legs. AFR is not supported on a line basis for ISDN.
CDP	S	This trigger is encountered on subsequent FC call legs.
International	S	
N11	S	
O_CPB	UU	Not applicable
O_NoA	PS	When the new call leg is joined to the Flex call while the terminator is still ringing and the ONA trigger has not been hit, the ONA trigger is deactivated.
OHD	S	OHD is supported for FC.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	UU	Not applicable
PRIB	NA	FC is not supported on PRI agents.
SDS	S	This trigger is encountered on subsequent FC call legs.
SFC	UU	Not applicable
SIT	NA	FC is not supported on trunk agents.
Specified_Carrier	S	This trigger is encountered on subsequent FC call legs.
T_Busy	PS	This trigger is encountered on subsequent FC call legs.
T_NoA	PS	On the subsequent leg of a multi-way call, trigger T_NoA can be hit. It is possible to conference the second leg while alerting; the T_TNoanswer timer is deactivated when this occurs.
TAT	S	This trigger is encountered on subsequent FC call legs.
TRA	PS	When the FC is subscribed (for ISDN BRI interface), trigger TRA can be encountered on subsequent FC call legs.
TKTERM	N/A	

22.3.5.2 Event interactions with FC

Table 218 provides event interactions with FC.

Table 218 Event interactions with FC

Event	Status	Interactions
O_Disconnect	PS	When an ISDN BRI agent has made a call which has armed a CPH event, the agent will not be allowed to activate FlexCall. If the agent tries to activate FlexCall, the attempt will be blocked and NACK treatment will be generated. The CONF softkey will remain and will not change to ADDNEXT. When an ISDN BRI agent has activated FlexCall and tries to join into a conference a leg that has a CPH event armed and for which the BRI agent is the CPH controller, the attempt will be blocked and FNAL treatment will be given to the BRI agent. The BRI agent can then disconnect the call, and then reselect the ADDNEXT softkey to create a new call leg. In a given call, when the FlexCall feature controller is a different agent from the agent which armed the CPH event, full FlexCall functionality is supported. If CPH is present during a FlexCall Conference, other FlexCall Conference members are denied to activate a Conference (i.e., FlexCall, 3WC or MADN). When CPH events are associated with an established conference (i.e. MADN bridging, FlexCall, or 3WC), conference members are blocked from activating a conference. The following CPH multi-conference calls are blocked. • FlexCall-MADN Bridging • FlexCall-3WC • FlexCall-FlexCall • MADN Bridging-FlexCall • MADN Bridging-MADN Bridging • 3WC-FlexCall • 3WC-MADN Bridging • 3WC-3WC
O_Disconnect_Called	PS	
Timeout	PS	
Network_Busy	S	This event can be encountered on a second leg (or subsequent leg) of a FC. When the new call leg is joined to the Flex call, any events that were armed on the new call leg are closed. A close message with CloseCause set to EDPs_completed is sent to the SCP.
O_Answer	PS	

Table 218 Event interactions with FC

Event	Status	Interactions
O_CPB	PS	This event can be encountered on a second leg (or subsequent leg) of a FC. When the new call leg is joined to the Flex call, any events that were armed on the new call leg are closed. A close message with CloseCause set to EDPs_completed is sent to the SCP.
O_NoA	PS	This event can be encountered on a second leg (or subsequent leg) of a FC. When the new call leg is joined to the Flex call, any events that were armed on the new call leg are closed. A close message with CloseCause set to EDPs_completed is sent to the SCP.
T_Answer	PS	
T_Busy	PS	
T_NoA	PS	

22.3.5.3 Other interactions with FC

Table 219 provides other interactions with FC.

Table 219 Other interactions with FC

Description	Status	Interactions
Send_To_Resource	PS	Send_To_Resource remains unsupported when the non-interruptible parameter is present.
DisplayText	S	When AIN display text is received on a subsequent leg of a flex call, it is displayed on the terminator until the flex call is bridged. Once the flex call is bridged, the display is updated to 'CONFERENCE' (The display is NOT updated for RES agents.). Whenever the FC collapses back to a normal two-party call, previous AIN display text information can be restored depending on the parties that have left the call. When FC is used to transfer a call, AIN DisplayText that is received on the transfer call leg is displayed on the transfer-to station. Once the call is transferred, the AIN display text is replaced with the DN of the originator DN (that is, the station that placed the call to the flex call subscriber).
ExtendedRinging	PS	Establishing a conference call during STR response processing deactivates ExtendedRinging functionality

22.4 Billing features

This section addresses the following billing features:

- account codes
- customer dialed account recording (CDAR)

- special billing (SPB)
- station message detail recording (SMDR)
- terminating billing option (TBO)

22.4.1 Account codes

The account codes feature allows a user to enter a billing number into a station message detail recording (SMDR) record for charge-back purposes. The account code can range from 2 to 14 digits. Within the customer group, the length of the code is fixed.

22.4.1.1 Trigger interactions with account codes

Table 220 provides trigger interactions with account codes.

Table 220 Trigger interactions with AC

Trigger	Status	Interactions
AFR	S	Calls originated using account codes can encounter this trigger. Once the call progresses to a stable talking state, the user is able to flash and dial the feature access code (FAC) for the Account Code First (Voluntary) feature without the occurrence of a trigger.
CDP	S	When the account code last (ACR) feature user dials a number, this trigger is not encountered until after the account code has been collected. Once the call progresses to a stable talking state, the user is able to flash and dial the FAC for the account code first (voluntary) feature without the occurrence of a trigger. When the account code feature user goes offhook to originate a call, and then dials the switch-based FAC that corresponds to the activation of account codes first feature, the call escapes this trigger. After the user enters in the account code and the called number, this trigger is encountered (when applicable to this call). When the account code feature user flashes during an active call, and then dials the switch-based FAC that corresponds to the activation of account codes first feature, the call escapes this trigger. After the user enters in the account code, this trigger is not encountered. The user can then hookflash back to the active call.
International	S	
N11	S	
O_CPB	S	Calls originated using account codes can encounter this trigger. Once the call progresses to a stable talking state, the user is able to flash and dial the FAC for the account code first (voluntary) feature without the occurrence of a trigger.
O_NoA	S	

Table 220 Trigger interactions with AC

Trigger	Status	Interactions
OHD	S	Once the call progresses to a stable talking state, the user is able to flash and dial the FAC for the account code first (voluntary) feature without the occurrence of a trigger. When the account code feature user goes offhook to originate a call, and then dials the switch-based FAC that corresponds to the activation of account codes first feature, the call escapes the this trigger. After the user enters in the account code and the called number, this trigger is encountered (when applicable to this call). When the account code feature user flashes during an active call, and then dials the switch-based FAC that corresponds to the activation of account codes first feature, the call escapes this trigger. After the user enters in the account code, this trigger is not encountered. The user can then hookflash back to the active call. When an OFFHKDEL subscriber makes a call with the account code first (voluntary) feature and the call encounters this trigger with an Analyze_Route response returned from the SCP, the “CLD NO” field in the SMDR record (when applicable) has the digits contained in parameter CalledPartyID. However, when the ACR feature is used in the above scenario, then the “CLD NO” field in the SMDR record (when applicable) contains the user dialed digits. When the account code last ACR feature user dials a number, this trigger is not encountered until after the account code has been collected.
OHI	S	When this trigger is assigned to a line that is also assigned the account code feature, the account code feature is bypassed for any originations from this line. This includes account codes first features, as the origination of a new call, or a hookflash from a call in the talking state results in the encountering of this trigger.

Table 220 Trigger interactions with AC

Trigger	Status	Interactions
One_Plus_Prefix	S	Once the call progresses to a stable talking state, the user is able to flash and dial the feature access code (FAC) for the Account Code First (Voluntary) feature without the occurrence of a trigger. When the account code feature user goes offhook to originate a call, and then dials the switch-based feature access code (FAC) that corresponds to the activation of account codes first feature, the call escapes the this trigger. After the user enters in the account code, and then the called number, this trigger is encountered, when applicable to this call. When the account code feature user flashes during an active call, and then dials the switch-based feature access code (FAC) that corresponds to the activation of account codes first feature, the call escapes this trigger. After the user enters in the account code, this trigger is not encountered. The user can then hookflash back to the active call.
Operator_Services	S	
PFC	S	When the account code last (ACR) feature user dials a number, trigger PFC does not apply. The trigger does not occur, since the user dialed a regular number. When the ACR feature user dials a public feature code, this trigger is encountered. No account codes are collected. Once the call progresses to a stable talking state, the user is able to flash and dial the feature access code (FAC) for the Account Code First (Voluntary) feature without the occurrence of a trigger. When the account code feature user goes offhook to originate a call, and then dials the switch-based feature access code (FAC) that corresponds to the activation of account codes first feature, the call escapes the this trigger. After the user enters in the account code, and then the called number, this trigger is encountered, when applicable to this call. When the account code feature user flashes during an active call, and then dials the switch-based feature access code (FAC) that corresponds to the activation of account codes first feature, the call escapes this trigger. After the user enters in the account code, this trigger is not encountered. The user can then hookflash back to the active call.
PRIB	NA	Account codes are not supported on PRI agents.

Table 220 Trigger interactions with AC

Trigger	Status	Interactions
SDS	S	When the ACR feature user dials a number, this trigger is not encountered until after the account code has been collected. Once the call progresses to a stable talking state, the user is able to flash and dial the feature access code (FAC) for the Account Code First (Voluntary) feature without the occurrence of a trigger. When the account code feature user goes offhook to originate a call, and then dials the switch-based feature access code (FAC) that corresponds to the activation of account codes first feature, the call escapes the this trigger. After the user enters in the account code, and then the called number, this trigger is encountered, when applicable to this call. When the account code feature user flashes during an active call, and then dials the switch-based feature access code (FAC) that corresponds to the activation of account codes first feature, the call escapes this trigger. After the user enters in the account code, this trigger is not encountered. The user can then hookflash back to the active call.
SFC	S	When the account code last (ACR) feature user dials a number, trigger SFC does not apply. The trigger does not occur, since the user dialed a regular number. When the ACR feature user dials a public feature code, this trigger is encountered. No account codes are collected. Once the call progresses to a stable talking state, the user is able to flash and dial the feature access code (FAC) for the Account Code First (Voluntary) feature without the occurrence of a trigger. When the account code feature user goes offhook to originate a call, and then dials the switch-based feature access code (FAC) that corresponds to the activation of account codes first feature, the call escapes the this trigger. After the user enters in the account code, and then the called number, this trigger is encountered, when applicable to this call. When the account code feature user flashes during an active call, and then dials the switch-based feature access code (FAC) that corresponds to the activation of account codes first feature, the call escapes this trigger. After the user enters in the account code, this trigger is not encountered. The user can then hookflash back to the active call.
SIT	NA	Account codes are not supported on trunk agents.

Table 220 Trigger interactions with AC

Trigger	Status	Interactions
Specified_Carrier	S	Calls originated using account codes can encounter this trigger. Once the call progresses to a stable talking state, the user is able to flash and dial the feature access code (FAC) for the account code first (voluntary) feature without the occurrence of a trigger. When the account code feature user flashes during an active call, and then dials the switch-based feature access code (FAC) that corresponds to the activation of account codes first feature, the call escapes this trigger. After the user enters in the account code, this trigger is not encountered. The user can then hookflash back to the active call.
T_Busy	S	Calls originated using account codes can encounter this trigger. Once the call progresses to a stable talking state, the user is able to flash and dial the FAC for the account code first (voluntary) feature without the occurrence of a trigger.
T_NoA	S	
TAT	S	
TRA	S	Calls originated using account codes can encounter trigger TRA.
TKTERM	N/A	

22.4.1.2 Event interactions with account codes

Table 221 provides event interactions with account codes.

Table 221 Event interactions with account codes

Event	Status	Interactions
Network_Busy	UU	Not applicable
O_Answer	UU	
O_CPB	UU	
O_NoA	UU	
T_Answer	UU	
T_Busy	UU	
T_NoA	UU	

22.4.1.3 Other interactions with account codes

Table 222 provides other interactions with account codes.

Table 222 Other interactions with Account codes

Description	Status	Interactions
Collect_Information	U	Account codes (first or last) cannot be activated through a Collect_Information message. The call goes to FNAL treatment.
AIN trigger criteria checking	S	The digits of the account code are not sent to the SCP. AIN trigger criteria checking uses the Called_Party DN dialed, not the account code dialed.
Create_Call	PS	The originator can not activate account codes until the CalledParty answers. When a Create_Call is requested to originate from a line that requires an account code, the account code feature at the Collect_Info PIC is bypassed and the call routes to the called party without the input of the account code. The Account Code Voluntary feature can activate after flashing during an active call established through the Create_Call functionality.

22.4.2 Customer dialed account recording

Customer dialed account recording (CDAR) allows variable length account codes to be entered on a per-call basis, along with predefined prefix digits to be prefixed to the called number.

CDAR has the same interactions as account codes.

22.4.3 Special billing

A special billing number can be datafilled against a line using the special billing (SPB) option.

22.4.3.1 Trigger interactions with SPB

Table 223 provides trigger interactions with SPB.

Table 223 Trigger interactions with SPB

Trigger	Status	Interactions
AFR	S	Calls to and from a line with SPB can hit these triggers.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	NA	SPB is not supported on PRI agents.
SDS	S	Calls to and from a line with SPB can hit these triggers.
SFC	S	
SIT	NA	SPB is not supported on trunk agents.
Specified_Carrier	S	Calls to and from a line with SPB can hit these triggers.
T_Busy	S	
T_NoA	S	
TAT	S	

Table 223 Trigger interactions with SPB (Continued)

Trigger	Status	Interactions
TRA	S	Calls to and from a line with SPB can encounter trigger TRA. For an AIN call originated by a line with the SPB option, the special billing number datafilled will be used for populating the ChargeNumber in the query message, when it exists. When a seven digit SPB number is datafilled, the numbering plan area (NPA) of the originating facility will be used to obtain a ten-digit charge number.
TKTERM	N/A	

22.4.3.2 Event interactions with special billing

Table 224 provides event interactions with special billing.

Table 224 Event interactions with special billing

Event	Status	Interactions
Network_Busy	S	Calls to and from a line with SPB can arm and detect this event.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

22.4.3.3 Other interactions with special billing

Table 225 provides other interactions with special billing.

Table 225 Other interactions with special billing

Description	Status	Interactions
ChargeNumber	S	For an AIN call originated by a line with the SPB option, the ChargeNumber in the query message is populated with the special billing number datafill, when it exists. When a seven digit SPB number is datafilled, then the numbering plan area (NPA) of the originating facility is used to obtain a ten-digit charge number. When the SPB option is not present, then the calling DN is used to populate the ChargeNumber.

22.4.4 Station message detail recording

When a centrex line or trunk originates a call that requires a station message detail recording (SMDR) call record, based on the originating line or trunk group data or IBN translation datafill, the SMDR record is generated regardless of whether or not the call is an AIN call.

22.4.4.1 Trigger interactions with SMDR

Table 226 provides trigger interactions with SMDR.

Table 226 Trigger interactions with SMDR

Trigger	Status	Interactions
AFR	S	A SMDR record is generated for each call leg and DF04 extension record provided for each trigger encountered containing billing parameters from the SCP response. The SDMR call record generated is a result of the dialed digits. The “CLD NO” field of the SMDR call record contains the number dialed by the originator, not the routing number returned by the SCP.
CDP	S	A SMDR record is generated for each call leg and DF04 extension record provided for each trigger encountered containing billing parameters from the SCP response. The “CLD NO” field of the SMDR call record is overwritten by the 10-digit number returned in the SCP response.
International	UU	Not applicable
N11	S	A SMDR record is generated for each call leg and DF04 extension record provided for each trigger encountered containing billing parameters from the SCP response. The SDMR call record generated is a result of the dialed digits. The “CLD NO” field of the SMDR call record contains the number dialed by the originator, not the routing number returned by the SCP.
O_CPB	UU	Not applicable
O_NoA	UU	Not applicable
OHD	S	A SMDR record is generated for each call leg and DF04 extension record provided for each trigger encountered containing billing parameters from the SCP response. The “CLD NO” field of the SMDR call record is overwritten by the 10-digit number returned in the SCP response.
OHI	S	
One_Plus_Prefix	UU	Not applicable

Table 226 Trigger interactions with SMDR (Continued)

Trigger	Status	Interactions
Operator_Services	UU	Not applicable
PFC	S	A SMDR record is generated for each call leg and DF04 extension record provided for each trigger encountered containing billing parameters from the SCP response. The “CLD NO” field of the SMDR call record is overwritten by the 10-digit number returned in the SCP response.
PRIB	UU	Not applicable
SDS	S	A SMDR record is generated for each call leg and DF04 extension record provided for each trigger encountered containing billing parameters from the SCP response. The SDMR call record generated is a result of the dialed digits. The “CLD NO” field of the SMDR call record contains the number dialed by the originator, not the routing number returned by the SCP.
SFC	UU	Not applicable
SIT	S	A SMDR record is generated for each call leg and DF04 extension record provided for each trigger encountered containing billing parameters from the SCP response. The SDMR call record generated is a result of the dialed digits. The “CLD NO” field of the SMDR call record contains the number dialed by the originator, not the routing number returned by the SCP.
Specified_Carrier	UU	Not applicable
T_Busy	UU	Not applicable
T_NoA	UU	Not applicable

Table 226 Trigger interactions with SMDR (Continued)

Trigger	Status	Interactions
TAT	S	A SMDR record is generated for each call leg and DF04 extension record provided for each trigger encountered containing billing parameters from the SCP response. The SDMR call record generated is a result of the dialed digits. The “CLD NO” field of the SMDR call record contains the number dialed by the originator, not the routing number returned by the SCP. In the case of a virtual DN TERMATT trigger with a forward call response, the CLD NO field of the SMDR records (dialed digit) is always overwritten by the ten digits of the virtual DN. In other words, when the originating agent in the same customer group dials the extension number, it is not the extension number that is filled in the “CLD NO” field, it is the full ten-digit DN.
TRA	UU	SMDR is not affected when this feature encounters trigger TRA.
TKTERM	N/A	

22.4.4.2 Event interactions with SMDR

Table 227 provides event interactions with SMDR.

Table 227 Event interactions with SMDR

Event	Status	Interactions
Network_Busy	UU	Not applicable
O_Answer	UU	
O_CPB	UU	
O_NoA	UU	
T_Answer	UU	
T_Busy	UU	
T_NoA	UU	

22.4.4.3 Other interactions with SMDR

Table 228 provides other interactions with SMDR.

Table 228 Other interactions with SMDR

Description	Status	Interactions
AMAslpID	S	A DF04 extension record is generated for AIN calls through the AIN01 option in customer group datafill, in table CUSTSMDR. This SMDR extension is only generated when the SCP response message contains an AMAslpID and at least one of the following items: • AMAAlternateBillingNumber • AMABusinessCustomerID • AMADigitsDialedWC
AMAAlternateBillingNumber	S	
AMABusinessCustomerID	S	
AMADigitsDialedWC	S	
Create_Call	S	When Create_Call creates a call, calls that generate SMDR records continue to do so.

22.4.4.4 Miscellaneous information for SMDR

Figure 117 on page 789 illustrates AIN and SMDR interworking.

The following list describes the decision box contents:

- **SMDR Req'd:** TRUE when the SMDR option is set in IBNXLA (IBNXL.SMDR) or when the originating IBN line has the SMDR option datafilled.

  Note: Parameter SMDR_OFFICE must to be set to YES.

- **Specific Trigger:** TRUE when any of the AIN triggers (and their associated response message) is hit. See Table 229.

Table 229 AIN triggers and responses

Trigger name	Response message
Off-Hook_Immediate	Analyze_Route
Off-Hook_Delay	Analyze_Route
Shared_Interoffice_Trunk	Analyze_Route
Specified_Carrier	Analyze_Route, Continue
One_Plus_Prefix	Analyze_Route, Continue
International	Analyze_Route, Continue
Operator_Services	Analyze_Route, Continue

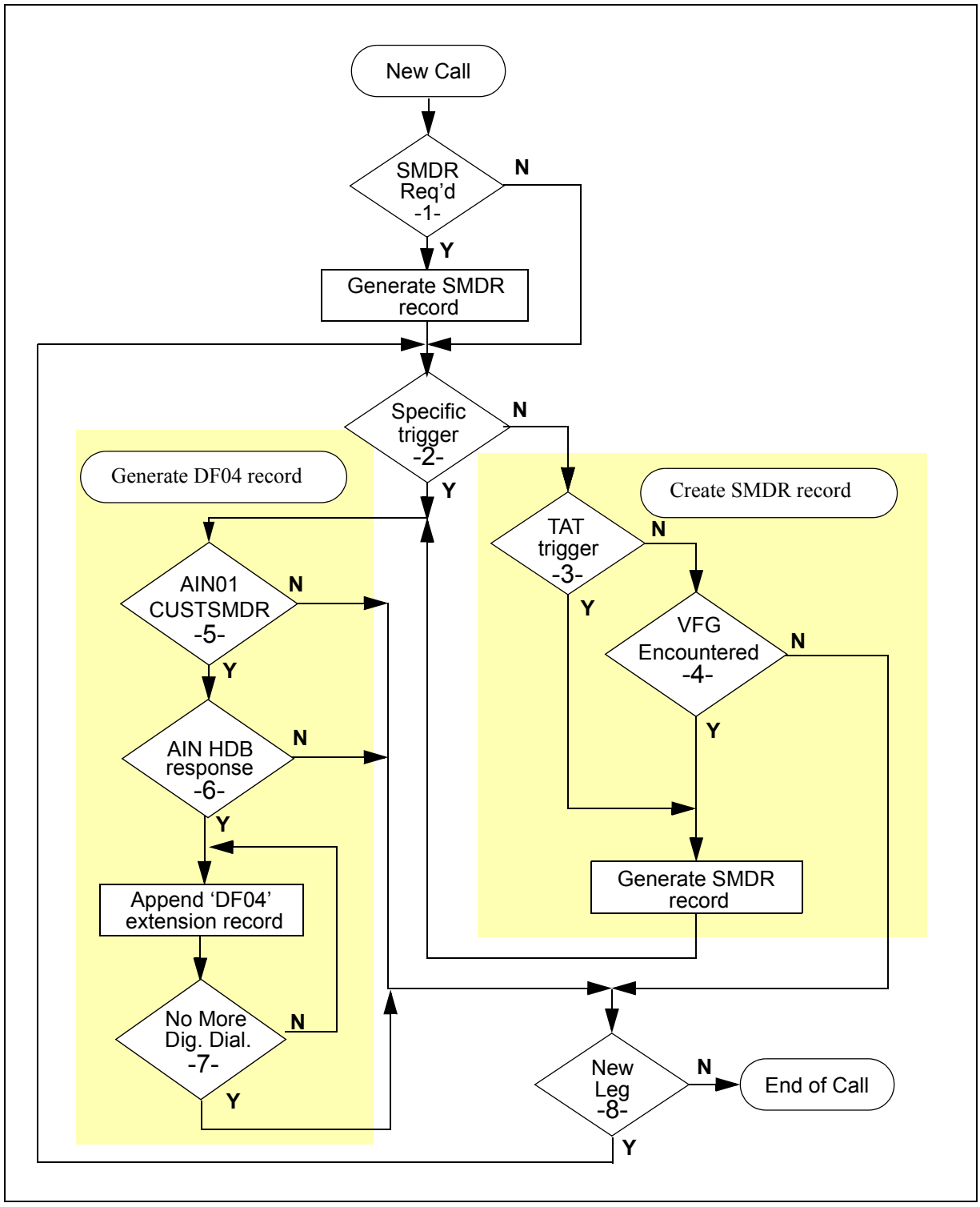
Table 229 AIN triggers and responses (Continued)

Trigger name	Response message
SDS	Analyze_Route, Continue
Customized_Dialing_Plan	Analyze_Route, Continue
PFC	Analyze_Route
N11	Analyze_Route, Continue
Automatic_Flexible_Routing	Analyze_Route
Terminating_Attempt	Authorize_Termination
OTHER TRIGGERS	Not applicable

- **AIN Forward Call:** TRUE when the call terminates on a TAT trigger that has the SMDR option and a Forward_Call response is received.
- **VFG Encountered:** TRUE when the call is routed through a VFG and when the SMDR option is datafilled for that VFG.
- **AIN01 CUSTSMDR:** TRUE when the AIN01 option is datafilled in table CUSTSMDR for the originating MDC customer group.
- **AIN HDB response:** TRUE when an AIN Response HDB can be found on the call and that there is at least one billing indicator.
- **No More Dig. Dial.:** TRUE when all the DIGITS_DIALED digit register are stored in a DF04 extension record.
- **New Leg:** TRUE when the call is retranslated in any way (VFG, Call forward, Re-Route, AIN routing).

Note: Parameter SMDR_OFFICE must be set to YES.

Figure 117 AIN and SMDR interworking



22.4.5 Terminating billing option

The terminating billing option (TBO) feature allows the operating company to generate AMA records for calls terminating to lines.

22.4.5.1 Trigger interactions with TBO

Table 230 provides trigger interactions with TBO.

Table 230 Trigger interactions with TBO

Trigger	Status	Interactions
AFR	S	After a call hits these triggers, the call can encounter TBO. When this occurs, the TBO functions correctly.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	UU	Not applicable
T_NoA	UU	Not applicable
TAT	S	TBO interacts properly with trigger TAT. Trigger TAT is hit and processed properly on lines with TBO. On lines with the AINDN option, the AMA call code is datafilled when adding TBO (for the TBO AMA record).

Table 230 Trigger interactions with TBO (Continued)

Trigger	Status	Interactions
TRA	UU	Not applicable
TKTERM	N/A	

22.4.5.2 Event interactions with TBO

Table 231 provides event interactions with TBO.

Table 231 Event interactions with Terminating billing option

Event	Status	Interactions
Network_Busy	UU	Not applicable
O_Answer	UU	
O_CPB	UU	
O_NoA	UU	
T_Answer	UU	
T_Busy	UU	
T_NoA	UU	

22.4.5.3 Other interactions with TBO

Table 232 provides other interactions with TBO.

Table 232 Other interactions with TBO

Description	Status	Interactions
AIN Billing	S	The presence of TBO does not affect AIN AMA.

22.5 Busy override features

This section addresses the executive busy override (EBO) feature.

22.5.1 EBO

EBO is a customer group-based feature, therefore, any calls going outside the customer group cannot be barged-in on. Any calls that are not considered INTRAGROUP as defined in IBN translations, cannot be barged-in on even when the originator and terminator are in the same customer group.

22.5.1.1 Trigger interactions with EBO

Table 233 provides trigger interactions with EBO.

Table 233 Trigger interactions with EBO

Trigger	Status	Interactions
AFR	S	Originating call model TDPs all trigger and respond properly. They do not affect the functionality of EBO. No triggers are hit on the EBO call.
CDP	S	
International	S	
N11	S	
O_CPB	UU	Not applicable
O_NoA	UU	Not applicable
OHD	S	Originating call model TDPs all trigger and respond properly. They do not affect the functionality of EBO. No triggers are hit on the EBO call.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	NA	EBO is not supported on PRI agents.
SDS	S	Originating call model TDPs all trigger and respond properly. They do not affect the functionality of EBO. No triggers are hit on the EBO call.
SFC	S	
SIT	NA	EBO is not supported on trunk agents.
Specified_Carrier	S	Originating call model TDPs all trigger and respond properly. They do not affect the functionality of EBO. No triggers are hit on the EBO call.
T_Busy	S	T_Busy can be hit prior to activating EBO. No triggers are hit on the EBO call.
T_NoA	UU	Not applicable
TAT	S	TAT can be hit before activating EBO. No triggers are hit on the EBO call.
TRA	UU	Not applicable
TKTERM	N/A	

22.5.1.2 Event interactions with EBO

Table 234 provides event interactions with EBO.

Table 234 Event interactions with EBO

Event	Status	Interactions
O_Disconnect	S	Any CPH event can be detected after call is being barged in by EBO. EBO cannot be established if a CPH event is armed in the first leg and NACK treatment is given. CPH Events armed in the call that barges in will be closed.
O_Disconnect_Called	S	
Timeout	S	
Network_Busy	S	The call can detect events prior to being able to activate EBO. The EBO feature can only be activated after the call is routed and the terminator is busy. Therefore, the NEL transaction is closed or detected before the EBO feature is started. Because no triggers are hit on the EBO call, no events can be armed on the EBO call.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

22.5.1.3 Other interactions with EBO

Table 235 provides other interactions with EBO.

Table 235 Other interactions with EBO

Description	Status	Interactions
Send_To_Resource	PS	EBO only barges in on stable calls. STR conversation with an announcement cannot be barged in on.
CallingPartyID	PS	When a new CallingPartyID is returned in a response, the terminating agent displays the new CallingPartyID returned. This behavior is also true when using the EBO feature. The display of the bargee and the other party is updated to display this new CallingPartyID after EBO successfully barged in. The other party is the agent who is talking with the bargee when the barger activates the EBO feature to barge in the call. Later, when the other party drops from the EBO call, the display of the bargee is re-updated and still shows the same new CallingPartyID.

Table 235 Other interactions with EBO

Description	Status	Interactions
CallingPartyBGID	S	On the terminating switch, the caller can barge in on the terminating party when he/she is in the same customer group as specified in parameter CallingPartyBGID. On the triggering switch, the caller can barge in on the originating party when they are in the same customer group.
Forward_Call	S	When a Forward_Call response is received on a call EBO cannot be used to barge in on the call. This is similar to EBO interactions with switch-based call forwarding. EBO is not allowed to barge in on a call that has encountered switch-based call forwarding.
DisplayText	S	When the call encounters AIN, and parameter DisplayText is received in an Authorize_Termination or Offer_Call message, the display text information is displayed on the called party's customer premises equipment (CPE). When a third party barges in on a call using this feature, a three party call is created. Later, when the third party drops off the call, one of the following scenarios occurs: • when the called party is a non-ISDN agent, the previous AIN display text information is restored to the called party's CPE • when the called party is an ISDN BRI agent, only the calling address provided by the previous AIN display text is restored to the called party's CPE When the calling party drops from the three party call rather than the third party, no AIN display text information is updated on the called party's CPE.
Create_Call	S	The SSP does not Barge-in on a call while attempting to service a Create_Call request. When the originator is alerted for a Create_Call request, Barge-In features (for example, EBO) cannot activate.

23 AIN/DMS-100 interactions (C)

WARNING
Limited information source
The status of each feature (documented in the interactions chapters) is provided as an indicator. Please read all information associated with each feature.

AIN interacts with many DMS-100 switch features. The purpose of this chapter is to document interactions between various AIN functionalities (for example, intra-AIN interactions). The feature interactions chapters are arranged alphabetically into five chapters. This chapter describes the interactions for features that begin with the letters C.

Note: See Chapter 21: "AIN interactions introduction" on page 717 to learn how to use this information.

23.1 Call-by-Call

Call-by-Call (CBC) is a service provided to incoming PRI trunks that uses VFGs to throttle calls on a calltype basis. The calltype is determined by the NSF Information Element in the PRI Setup, as well as, the Numbering Plan Indicator (NPI) in the CalledPartyID. There are no requirements in GR-1298 regarding translation based on the NSF.

23.1.1 Trigger interactions with CBC

Table 236 provides trigger interactions with CBC.

Table 236 Trigger interactions with CBC

Trigger	Status	Interactions
AFR	UU	
CDP	UU	
International	UU	

Table 236 Trigger interactions with CBC (Continued)

Trigger	Status	Interactions
N11	UU	
O_CPB	UU	
O_NoA	UU	
OHD	UU	
OHI	UU	
One_Plus_Prefix	UU	
Operator_Services	UU	
PFC	UU	
PRIB	UU	
SDS	UU	
SFC	UU	
SIT	UU	
Specified_Carrier	UU	
T_Busy	UU	
T_NoA	UU	
TAT	UU	
TRA	UU	
TKTERM	N/A	

23.1.2 Event interactions with CBC

Table 237 provides event interactions with CBC.

Table 237 Event interactions with CBC

Event	Status	Interactions
Network_Busy	UU	
O_Answer	UU	
O_CPB	UU	
O_NoA	UU	
T_Answer	UU	
T_Busy	UU	
T_NoA	UU	

23.1.3 Other interactions with CBC

Table 238 provides other interactions with CBC.

Table 238 Other interactions with CBC

Description	Status	Interactions
Analyze_Route	UU	When the Call-by-Call (CBC) feature is active, incoming PRI calls route directly to VFGs through an RTEREF selector in table LTCALLS. AIN cannot translate the Analyze_Route CalledPartyID for O_CPB, O_NoA, and the Info Collected triggers or NELs, when NELs are armed in response to one of these triggers **when the LTCALLs routeref selector is encountered during AIN response translations.** A call goes to treatment **AINF** when all of the following conditions apply: - The trigger is OCPB, ON_A, or InforCol and is subscribed to the PRI trunk. - Table LTCALLS for the PRI trunk uses RTEREF selector for the relevant call type. - The Analyze_Route response to such a trigger (or to the NEL armed at such a trigger) is received. - The Analyze_Route response contains a CalledPartyID with no trunk group parameter.
Analyze_Route	S	When the Call-by-Call (CBC) feature is active, incoming PRI calls route directly to VFGs through an RTEREF selector in table LTCALLS. AIN translates the Analyze_Route CalledPartyID for O_CPB, O_NoA, and the Info Collected triggers or NELs, when NELs are armed in response to one of these triggers **when the LTCALLs routeref selector is encountered during AIN response translations.** Note: Whenever a call gets routed via PRI to VFG, due to the RTEREF selector, the response simplification and other related PXLAMAP tuples are not encountered.
Collect_Info	UU	

23.2 Call forwarding features

This section describes interactions with call forwarding (CFX) features. See Table 180 “DMS-100 features” on page 720 for a complete list of call forwarding features.

23.2.1 Call forwarding

Call forwarding (CFW) is a service that allows a subscriber to have incoming calls to the directory number (DN) of a station forwarded to a predetermined DN.

This section describes interactions with all call forwarding features that are not based on the busy/noanswer condition of the base station and are not discussed elsewhere in Section 21.1.

Note: Usage sensitive call forwarding and normal call forwarding share the same interactions with AIN.

23.2.1.1 Trigger interactions with CFW

Table 239 provides trigger interactions with CFW.

Table 239 Trigger interactions with CFW

Trigger	Status	Interactions
AFR	PS	A call can hit trigger AFR on the forwarded call leg. Trigger AFR supports POTS, RES, IBN, and RCF DN forwarding agent types. RCF DN is only supported for the office-wide version of Network_Busy.
CDP	PS	The call can hit trigger CDP on the forwarded call leg. Trigger CDP supports RES, and IBN forwarding agent types.
International	PS	When the particular call forwarding feature allows forwarding to this type of number, then this trigger is hit on the forwarded call leg. This trigger supports the forwarding agent types that follow: POTS, RES, IBN
N11	PS	The call can hit this trigger on the forwarded call leg. This trigger supports the forwarding agent types that follow: POTS, RES, IBN, RCF DN.
O_CPB	PS	The call can hit this trigger only when O_CPB is applied to the originator of a redirected call. This trigger cannot be hit at the redirecting agent.
O_NoA	PS	The call can hit this trigger only when O_NoA is applied to the originator of a redirected call. This trigger cannot be hit at the redirecting agent.
OHD	PS	The call can hit this trigger on the forwarded call leg. The trigger supports the forwarding agent types that follow: POTS, RES, IBN.
OHI	S	This trigger cannot be hit on the forwarded call leg.
One_Plus_Prefix	PS	When the particular call forwarding feature allows forwarding to this type of number, then this trigger is hit on the forwarded call leg. This trigger supports the forwarding agent types that follow: POTS, RES, IBN
Operator_Services	PS	

Table 239 Trigger interactions with CFW (Continued)

Trigger	Status	Interactions
PFC	PS	Because validation is not done on the forward-to number, the non-programmable forms of call forwarding (for example, CFDA, CFBL and CFW) allow the datafilling of a feature access code as the call forwarding number. When call forwarding forwards a call to the PFC access code, call forwarding does not invoke AIN for this trigger. Call forwarded calls do not hit this trigger.
PRIB	NA	Call forwarding is not supported on PRI agents.
SDS	PS	The call can hit this trigger on the forwarded call leg. This trigger supports the forwarding agent types that follow: POTS, RES, IBN, RCF DN.
SFC	PS	Because validation is not done on the forward-to number, the non-programmable forms of call forwarding (for example, CFDA, CFBL and CFW) allow the datafilling of a feature access code as the call forwarding number. When call forwarding forwards a call to the SFC access code, call forwarding does not invoke AIN for this trigger. Call forwarded calls do not hit this trigger.
SIT	NA	Call forwarding is not supported on trunk agents.
Specified_Carrier	PS	When the particular call forwarding feature allows forwarding to this type of number, then this trigger is hit on the forwarded call leg. This trigger supports the forwarding agent types that follow: POTS, RES, IBN
T_Busy	S	Call forwarding variants that are not based on Busy/No_Answer conditions have precedence over T_Busy.
T_NoA	S	Call forwarding variants that are not based on Busy/No_Answer conditions have precedence over T_NoA.
TAT	S	The call can hit this trigger on the forwarded call leg. TAT supports the agent types that follow: POTS, RES, IBN, RCF DN. TAT has precedence over call forwarding.
TRA	S	Call forwarding variants that are not based on Busy/No_Answer conditions take precedence over trigger TRA. The call can encounter trigger TRA on the forwarded call leg.
TKTERM	N/A	

23.2.1.2 Event interactions with CFW

Table 240 provides event interactions with CFW.

Table 240 Event interactions with CFW

Event	Status	Interactions
Network_Busy	PS	For calls involving the attendant console, the NEL event is closed when the call encounters call forwarding variants. A close message with CloseCause of EDPs-completed is sent to the SCP. Call forwarding has precedence over T_Busy, T_Answer, and T_NoA events.
O_Answer	PS	
O_CPB	PS	
O_NoA	PS	
T_Answer	PS	
T_Busy	PS	
T_NoA	PS	
O_Disconnect	S	O_Disconnect cannot be armed after the call has been redirected by call forwarding features. O_Disconnect events that are armed before the call has been redirected will be detected when the Originator disconnects.
O_Disconnect_Called	S	O_Disconnect_Called can be armed and detected after the call has been redirected by call forwarding features.
Timeout	NA	

23.2.1.3 Other interactions with CFW

Table 241 provides other interactions with CFW.

Table 241 Other interactions with CFW

Other	Status	Interactions
Analyze Route	S	After call forwarding takes place, for AIN response messages, the call routes according to the response message parameters.
Cancel Resource Event	S	After call forwarding takes place, the processing of the previous Send to Resource message is terminated. A Resource Clear message is sent and the call is given AIN Final treatment (AINF).
ChargePartyStationType	S	

Table 241 Other interactions with CFW (Continued)

Other	Status	Interactions
ChargeNumber	S	For trunk-originated calls without FGD signaling, the RedirectingPartyID or the original called number are used to populate the ChargeNumber, when they are included in the IAM or the PRI setup message. When this information is not provided in the IAM or PRI setup message, the CallingPartyID is used to populate the ChargeNumber For more information, see Section 23.2.9 , “Miscellaneous,” on page 825.
Continue	S	After call forwarding takes place, when subsequent triggering at the Info_Analyzed TDP or Termination_Attempt occurs, the call is forwarded based on the final response. When no subsequent triggering takes place, the call continues to terminate to the remote station.
Disconnect	S	The call is given AIN disconnect treatment. ***Note:*** For CFD, the caller hears ringing followed by disconnect treatment.
DisplayText	S	For any call forwarding feature, the SSP does not forward DisplayText information to the forwarded-to party.
Extended Ringing	S	ER can be applied to the forwarded DN, when applicable
Forward Call	S	
LATA	S	
Maximum Serial Triggers	S	The maximum serial triggers set by the local operating company applies to each call leg. For example, when the maximum serial triggers is set to 6, calls can trigger up to 6 times on the first call leg (that is, originator to base station) and up to 6 times again on each forwarded call leg (that is, base station to remote station). For more information, see Section 21.5.6 , “Serial triggering,” on page 740.
OriginalCalledPartyID	S	
PrimaryCarrier	S	

Table 241 Other interactions with CFW (Continued)

Other	Status	Interactions
Query message parameters	S	Because originating triggers take place on behalf of the base station, certain query message parameters are populated on the basis of the base station, not the originating station. Call forwarding redirection takes place at the beginning of the call forwarding feature.
Redirection counters	S	Redirection only occurs when one of the following scenarios occurs: • switch-based call forwarding takes place • an AIN Forward_Call response is received • an Analyze_Route response with a RedirectingPartyID is received Section 23.2.9 , “Miscellaneous,” on page 825 summarizes how these different routing methods impact the switch-based redirection counter and the redirection counter encoded in AIN query messages. If SOC option AIN00310 is OFF, or value of office parameter REDIRECTION_FRAMEWORK is N, the redirection counter value within the redirection information parameter overrides the current switch-based value, when the value returned by the SCP is greater than or equal to the value sent up in the query message. If SOC option AIN00310 is ON and value of office parameter REDIRECTION_FRAMEWORK is Y, the redirection counter value within the redirection information parameter overrides the current switch-based value, when the value returned by the SCP is greater than or equal to the value sent up in the query message, or the redirection count sent by SCP in response message is '0'.
RedirectionInformation	S	
RedirectingPartyID	S	
RedirectingReason	S	For more information, see Section 23.2.9 , “Miscellaneous,” on page 825.

Table 241 Other interactions with CFW (Continued)

Other	Status	Interactions
Send to Resource	S	Any collected digits are translated using the numbering plan of the forwarding base station.
Update message	S	An Update message with “Change Status of MWI” on an agent overrides all types of call forward on the agent. The Update MWI functionality turns ON and OFF the MWI on the agent, not on the call forwarded DNs.
Create_Call	S	When alerting the originator, CFW is not activated.
UserID	S	For more information, see Section 23.2.9 , “Miscellaneous,” on page 825.

23.2.2 Call forward busy features

Call forward busy features (CFBL/CFB) allow incoming calls to a busy DN to be forwarded to a designated DN.

23.2.2.1 Trigger interactions with CFBL/CFB

Table 242 provides trigger interactions with CFBL/CFB.

Table 242 Trigger interactions with CFBL/CFB

Trigger	Status	Interactions
AFR	These triggers have the same interactions as call forwarding. Section 23.2 “Call forwarding features” on page 800.	
CDP		
International		
N11		
O_CPB	S	All call forward busy features take precedence over O_CPB.
O_NoA	These triggers have the same interactions as call forwarding. Section 23.2 “Call forwarding features” on page 800.	
OHD		
OHI		
One_Plus_Prefix		
Operator_Services		

Table 242 Trigger interactions with CFBL/CFB (Continued)

Trigger	Status	Interactions
PFC	S	Because validation is not done on the forward-to number, the non-programmable forms of call forwarding (for example, CFBL) allow the datafilling of a feature access code as the call forwarding number. Call forward busy features (CFBL/CFB) apply busy treatment to the call and the trigger is not hit.
PRIB	These triggers have the same interactions as call forwarding. Section 23.2 “Call forwarding features” on page 800.	
SDS		
SFC	S	Because validation is not done on the forward-to number, the non-programmable forms of call forwarding (for example, CFBL) allow the datafilling of a feature access code. as the call forwarding number. Call forward busy features (CFBL/CFB) apply busy treatment to the call and the trigger is not hit.
SIT	These triggers have the same interactions as call forwarding. Section 23.2 “Call forwarding features” on page 800.	
Specified_Carrier		
T_Busy	S	T_Busy has precedence over call forwarding busy features. When a Continue or an Offer_Call response is received, call forwarding can be encountered.
T_NoA	These triggers have the same interactions as call forwarding. Section 23.2 “Call forwarding features” on page 800.	
TAT		
TRA	S	No interaction
TKTERM	N/A	

23.2.2.2 Event interactions with CFBL/CFB

Table 243 provides event interactions with CFBL/CFB.

Table 243 Event interactions with CFBL/CFB

Event	Status	Interactions
Network_Busy	This event has the same interactions as call forwarding. See Section 23.2 “Call forwarding features” on page 800.	
O_Answer		
O_CPB	S	Call forwarding busy takes precedence over O_CPB.

Table 243 Event interactions with CFBL/CFB (Continued)

Event	Status	Interactions
O_NoA	This event has the same interactions as call forwarding. See Section 23.2 “Call forwarding features” on page 800.	
T_Answer		
T_Busy	S	The T_Busy event takes precedence over call forward busy features. When a Continue or an Offer_Call response is received, call forwarding can be encountered.
T_NoA	This event has the same interactions as call forwarding. See Section 23.2 “Call forwarding features” on page 800.	
O_Disconnect	S	O_Disconnect cannot be armed after the call has been redirected by call forwarding features. O_Disconnect events that are armed before the call has been redirected will be detected when the Originator disconnects.
O_Disconnect_Called	S	O_Disconnect_Called can be armed and detected after the call has been redirected by call forwarding features.
Timeout	NA	

23.2.2.3 Other interactions with CFBL/CFB

Table 244 provides other interactions with CFBL/CFB.

Table 244 Other interactions with CFBL/CFB

Description	Status	Interactions
See Table 241 “Other interactions with CFW” on page 803.		
Offer_Call	S	When this response is returned from the SCP, and call waiting on the terminating line is active, call forward busy is encountered when provisioned.
Continue	S	
Authorization_Termination	S	
Create_Call	S	When alerting the originator, CFBL/CFB is not activated.

23.2.3 Call forward don’t answer features

Call forward don’t answer features (CFDA/CFD) forward unanswered incoming calls to a designated DN.

Note: This section also applies to subscriber programmable ringing for CFDA on RES.

CAUTION
Possible call regression
For all variants of call forward don't answer on POTS, RES, and IBN sets: when an agent with an active call forwarding don't answer feature is in conference on a three-way call while ringing, the call regresses to the base station when an AIN trigger is encountered on the forwarding leg, except for SDS and CDPCODE triggers.

Only SDS and CDPCODE triggers are encountered. In response to the SDS and CDPCODE triggers, if an AR response is sent arming a NEL, a close message is sent by the SSP with no parameters in the message. The valid responses after this trigger are AnalyzeRoute, Continue and Disconnect. STR is not supported.

Option call forward don't answer continue existing treatment (CFDCET) is used to determine how to handle call forward don't answer (CFD) calls that forward over an SS7 trunk to a busy remote station. When CFDCET is set to either CLEAR_BASE or ALERT_BASE and a CFD over an SS7 trunk to a busy remote station occurs, the originator hears ringing and the call does not forward. When CLEAR_BASE is specified, station ringing is stopped at the base station and the originator continues to hear audible ringing. When ALERT_BASE is specified, the CFD base station continues to ring and the call is not forwarded.

23.2.3.1 Trigger interactions with CFDA/CFD

Table 245 provides trigger interactions with CFDA/CFD.

Table 245 Trigger interactions with CFDA/CFD

Trigger	Status	Interactions
AFR	These triggers have the same interactions as call forwarding. Section 23.2 "Call forwarding features" on page 800.	
CDP		
International		
N11		
O_CPB		

Table 245 Trigger interactions with CFDA/CFD (Continued)

Trigger	Status	Interactions
O_NoA (Intra-switch)	PS	When the AIN ExtendedRinging SOC option is turned ON, the interaction between O_NoA and CFDA/CFD is modified to ensure that O_NoA occurs after call forwarding occurs. The interaction follows. When CFDA/CFD is detected on the terminator's line, both O_NoA and CFDA/CFD timers are compared. When the CFDA/CFD timer is less than the O_NoA timer (by at least two seconds) the CFDA/CFD feature is invoked. After call forwarding has occurred, O_NoA is invoked. However, when the CFDA/CFD timer is greater than or equal to the O_NoA timer, the O_NoA timer is set to the value of the CFDA/CFD timer + 2 seconds. When O_NoA timers have already started because of a previous allocation, the comparison of the already started (and not expired) O_NoA timers and CFDA/CFD timer, is still done with the original value of (the already started) O_NoA timers, the delay between allocations is not taken into account. When a call arming O_NoA events lands on an agent subscribed to CFD/CFDA after multiple allocations and if the call has encountered any AIN redirection or has been forwarded due to CFD/CFDA feature, the O_NoA timers are restarted with CFDA/CFD timer + 2 seconds, even if the O_NoA timers are greater than CFDA/CFD timer + 2 seconds. When O_NoA NELs are armed in a call involving multiple allocations, any O_NoA events/trigger with already expired timers (that were started at a previous allocations) will occur before CFDA/CFD is encountered. When T_NoA trigger or event is encountered on the terminator with its timer value smaller than or equal to the CFDA/CFD timer, O_NoA trigger’s (if subscribed on the originator) timer is not compared with CFDA/CFD timer. Hence even if O_NoA trigger timer value is less than CFDA/CFD timer, it is not altered to CFDA/CFD timer + 2 seconds. When option CFDCET is set to ALERT_BASE or CLEAR_BASE and the CFD timer is shorter than the O_NoA timer, trigger O_NoA is still hit. It is as though CFD never occurred.
O_NoA (Inter-switch)	PS	Since the trunk to the terminating party is seized, any forwarding that occurs at the terminating side is transparent, and as such, extended ringing is provided.

Table 245 Trigger interactions with CFDA/CFD (Continued)

Trigger	Status	Interactions
OHD	These triggers have the same interactions as call forwarding. Section 23.2 “Call forwarding features” on page 800.	
OHI		
One_Plus_Prefix		
Operator_Services		
PFC	S	Because validation is not done on the forward-to number, the non-programmable forms of call forwarding (for example, CFDA,) allow the datafilling of a feature access code as the call forwarding number. Call forward don’t answer features (CFDA/CFD), continues to ring the station. This trigger is not hit.
PRIB	These triggers have the same interactions as call forwarding. Section 23.2 “Call forwarding features” on page 800.	
SDS	These triggers have the same interactions as call forwarding. Section 23.2 “Call forwarding features” on page 800.	
SFC	S	Because validation is not done on the forward-to number, the non-programmable forms of call forwarding (for example, CFDA,) allow the datafilling of a feature access code as the call forwarding number. Call forward don’t answer features (CFDA/CFD), continues to ring the station. This trigger is not hit.
SIT	These triggers have the same interactions as call forwarding. Section 23.2 “Call forwarding features” on page 800.	
Specified_Carrier		
T_Busy		
T_NoA	S	When CFD/CFDA and T_NoA triggers are present at the terminating end, the feature that has the shortest no-answer timer has precedence. When a Continue response is received, in response to an T_NoA call forward don’t answer features are not encountered. When option CFDCET is set to ALERT_BASE or CLEAR_BASE, the call is forwarded over an ISUP trunk to a busy station. Although the CFD timer is shorter than the T_NoA timer, the T_NoA trigger is not hit.
TAT	These triggers have the same interactions as call forwarding. Section 23.2 “Call forwarding features” on page 800.	

Table 245 Trigger interactions with CFDA/CFD (Continued)

Trigger	Status	Interactions
TRA	S	TRA trigger has precedence over CFDA/CFD. The SSP allows a call that encounters trigger TRA the to encounter CFDA/CFD following the receipt of a Continue response message.
TKTERM	N/A	

23.2.3.2 Event interactions with CFDA/CFD

Table 246 provides event interactions with CFDA/CFD.

Table 246 Event interactions with CFDA/CFD

Event	Status	Interactions
Network_Busy	These triggers have the same interactions as call forwarding. Section 23.2 “Call forwarding features” on page 800.	
O_Answer		
O_CPB		
O_Disconnect	S	O_Disconnect cannot be armed after the call has been redirected by call forwarding features. O_Disconnect events that are armed before the call has been redirected will be detected when the Originator disconnect
O_Disconnect_Called	S	O_Disconnect_Called can be armed and detected after the call has been redirected by call forwarding features.
Timeout	NA	

Table 246 Event interactions with CFDA/CFD (Continued)

Event	Status	Interactions
O_NoA (Intra-switch)	PS	CFDA features have precedence over the O_NoA event. When the AIN ExtendedRinging SOC option is turned ON, the interaction between O_NoA and CFDA/CFD is modified to ensure that O_NoA occurs after call forwarding occurs. The interaction follows. When CFDA/CFD is detected on the terminator's line, both O_NoA and CFDA/CFD timers are compared. When the CFDA/CFD timer is less than the O_NoA timer (by at least two seconds) the CFDA/CFD feature is invoked. After call forwarding has occurred, O_NoA is invoked. However, when the CFDA/CFD timer is greater than or equal to the O_NoA timer, the O_NoA timer is set to the value of the CFDA/CFD timer + 2 seconds. When O_NoA timers have already started because of a previous allocation, the comparison of the already started (and not expired) O_NoA timers and CFDA/CFD timer, is still done with the original value of (the already started) O_NoA timers, the delay between allocations is not taken into account. When a call arming O_NoA events lands on an agent subscribed to CFD/CFDA after multiple allocations and if the call has encountered any AIN redirection or has been forwarded due to CFD/CFDA feature, the O_NoA timers are restarted with CFDA/CFD timer + 2 seconds, even if the O_NoA timers are greater than CFDA/CFD timer + 2 seconds. When O_NoA NELs are armed in a call involving multiple allocations, any O_NoA events/trigger with already expired timers (that were started at a previous allocations) will occur before CFDA/CFD is encountered. When option CFDCET is set to ALERT_BASE or CLEAR_BASE, the call is forwarded over an ISUP trunk to a busy station. Although the CFD timer is shorter than the O_NoA timer, the O_NoA event is still detected. It is as though CFD never occurred.
O_NoA (Inter-switch)	PS	Since the trunk to the terminating party is seized, any forwarding that occurs at the terminating side is transparent, and as such, extended ringing is provided.
T_Answer	This event has the same interactions as call forwarding. Section 23.2 “Call forwarding features” on page 800.	
T_Busy		

Table 246 Event interactions with CFDA/CFD (Continued)

Event	Status	Interactions
T_NoA	S	The feature with the shortest no-answer timer has precedence. When a Continue response is received in response to a T_NoA event, call forward don't answer features are not encountered. When option CFDCET is set to ALERT_BASE or CLEAR_BASE, the call is forwarded over an ISUP trunk to a busy station. Although the CFD timer is shorter than the T_NoA timer, the T_NoA event is closed when CFD activates. The close cause is set to EDPs Completed.
TKTERM	N/A	

23.2.3.3 Other interactions with CFDA/CFD

Table 247 provides other interactions with CFDA/CFD.

Table 247 Other interactions with CFDA/CFD

Description	Status	Interactions
See Table 241 "Other interactions with CFW" on page 803.		
Offer_Call	S	When this response is received and the call remains unanswered, the T_NoA trigger and event or call forward don't answer features, when provisioned, is encountered. When both are provisioned, the feature with the shortest No_answer timer takes precedence, and the feature with the longer timer is never activated.
Continue	S	
Authorize_Termination	S	
Create_Call	S	When alerting the originator, CFDA/CFD is not activated.
Extended Ringing	S	Inter-switch: Because the trunk to the terminating party is seized, any forwarding that occurs at the terminating side is transparent, and as such Extended Ringing is provided. Intra-switch: When either SOC AIN00263 or SOC AIN00291 is ON, If CFD/CFDA is detected on the terminator's line, both O_NoA and CFD/CFDA timers are compared. If the call forwarding timer is less than the O_NoA timer (by at least 2 seconds) the CFD/CFDA feature will be invoked followed by O_NoA, and ER would be applied. However, if the call forwarding timer is greater than or equal to the O_NoA timer, then the O_NoA timer would be delayed by the CFD/CFDA timer + 2 seconds. This would allow the CFD/CFDA feature to be invoked first, followed by ER.

23.2.4 Call forwarding group don't answer for POTS, IBN, and RES lines

Call forwarding group don't answer for POTS, IBN, and RES lines (CFGD/CFGDA) allows a call to hunt for an idle group member and to be forwarded when the call is not answered within a certain amount of time.

CAUTION
Possible call regression
For all variants of call forwarding group don't answer on POTS, RES, and IBN sets: when an agent with an active call forwarding don't answer feature is in conference on a three-way call while ringing, the call regresses to the base station when an AIN trigger is encountered on the forwarding leg, except for SDS and CDPCODE triggers.

Only SDS and CDPCODE triggers are encountered. In response to the SDS and CDPCODE triggers, if an AR response is sent arming a NEL, a close message is sent by the SSP with no parameters in the message. The valid responses after this trigger are AnalyzeRoute, Continue and Disconnect. STR is not supported.

23.2.4.1 Trigger interactions with CFGD/CFGDA

Table 248 provides trigger interactions with CFGD/CFGDA.

Table 248 Trigger interactions with CFGD/CFGDA

Trigger	Status	Interactions
AFR	S	During translation of the forwarding call leg, the call can hit these triggers. IBN internal CFGD takes place within the hunting facility PIC. While forwarding in the IBN internal CFGD feature, the call does not hit AIN triggers.
CDP	S	
International	UU	Not applicable
N11	S	During translation of the forwarding call leg, the call can hit this trigger. IBN internal CFGD takes place within the hunting facility PIC. While forwarding in the IBN internal CFGD feature, the call does not hit AIN triggers.
O_CPB	UU	Not applicable
O_NoA	UU	Not applicable

Table 248 Trigger interactions with CFGD/CFGDA (Continued)

Trigger	Status	Interactions
OHD	S	During translation of the forwarding call leg, the call can hit this trigger IBN internal CFGD takes place within the hunting facility PIC. While forwarding in the IBN internal CFGD feature, the call does not hit an AIN trigger.
OHI	S	The forwarded call leg does not hit this trigger.
One_Plus_Prefix	UU	Not applicable
Operator_Services	UU	Not applicable
PFC	UU	Not applicable
PRIB	NA	Call forwarding is not supported on PRI agents.
SDS	S	During translation of the forwarding call leg, the call can hit this trigger. IBN internal CFGD takes place within the hunting facility PIC. While forwarding in the IBN internal CFGD feature, the call does not hit AIN triggers.
SFC	UU	Not applicable
SIT	NA	Call forwarding is not supported on trunk agents.
Specified_Carrier	UU	Not applicable
T_Busy	UU	Not applicable
T_NoA	UU	Not applicable
TAT	S	During translation of the forwarding call leg, the call can hit this trigger. IBN internal CFGD takes place within the hunting facility PIC. While forwarding in the IBN internal CFGD feature, the call does not hit AIN triggers.
TRA	S	Trigger TRA has precedence over CFGDA/CFGD. The SSP allows a call that encounters trigger TRA to encounter CFGDA/CFGD following the receipt of a Continue response message.
TKTERM	N/A	

23.2.4.2 Event interactions with CFGD/CFGDA

Table 249 provides event interactions with CFGD/CFGDA.

Table 249 Event interactions with CFGD/CFGDA

Event	Status	Interactions
Network_Busy	PS	For calls that involve the attendant console, the NEL event is closed when the call encounters CFGD/CFGDA. A Close message with a CloseCause of EDPs completed is sent to the SCP. This event can be encountered after being forwarded by CFGD/CFGDA.
O_Answer	PS	
O_CPB	PS	
O_NoA	PS	
O_Disconnect	S	O_Disconnect cannot be armed after the call has been redirected by call forwarding features. O_Disconnect events that are armed before the call has been redirected will be detected when the Originator disconnects.
O_Disconnect_Called	S	O_Disconnect_Called can be armed and detected after the call has been redirected by call forwarding features.
Timeout	NA	
T_Answer	UU	Not applicable
T_Busy	UU	
T_NoA	UU	
ExtendedRinging	PS	When internal = NO, the interaction of CFGDA/CFGD with ER is supported in the same way as CFDA/CFD. When internal = YES and CFGDA/CFGD has forwarded the call, when the ER parameter is received in an STR response it is ignored.

23.2.4.3 Other interactions with CFGD/CFGDA

Table 250 provides other interactions with CFGD/CFGDA.

Table 250 Other interactions with CFGD/CFGDA

Other	Status	Interactions
See Table 241 “Other interactions with CFW” on page 803.		
Offer_Call	S	When an offered call remains unanswered, the CFGD/CFGDA feature is encountered when provisioned.

Table 250 Other interactions with CFGD/CFGDA (Continued)

Other	Status	Interactions
DisplayText	S	AIN display text information is displayed on the base station before the CFGDA/CFGD timer expires and the call is forwarded.
Create_Call	S	When alerting the originator, CFW is not activated.

23.2.5 Call forward programming

Call forward programming (CFWP) allows subscribers to enter the DN where the calls are to be forwarded. Validation is performed on the forwarded-to number to ensure that the call can be routed and/or terminated, and that the number does not invoke a feature such as AIN.

Note 1: When call forwarding is not activated because the call is not answered, or a disconnect or send to resource (response) message is received, call forwarding to the dialed DN can be activated by repeating the call within the CFWP time-out period.

Note 2: Information in this section applies to POTS CFWP.

23.2.5.1 Trigger interactions with CFWP

Table 251 provides trigger interactions with CFWP.

Table 251 Trigger interactions with CFWP

Trigger	Status	Interactions
AFR	S	These triggers can be hit during CFWP.
CDP	S	
International	UU	Not applicable
N11	S	This trigger can be hit during CFWP.
O_CPB	UU	Not applicable
O_NoA	UU	Not applicable
OHD	S	When the originator goes offhook and dials the CFWP access code. When the originator subscribes to this trigger, no triggering takes place because feature access codes escape this trigger. A second dial tone is received and the user dials the remote DN. The call attempts to set up a connection with the remote DN, at this point the OHD trigger can be hit.
OHI	S	OHI takes precedence over CFWP. When the call hits this trigger, the call does not encounter CFWP.

Table 251 Trigger interactions with CFWP

Trigger	Status	Interactions
One_Plus_Prefix	UU	Not applicable
Operator_Services	UU	Not applicable
PFC	S	The PFC VSC or FAC cannot be stored as the forwarded-to party for CFWP features. A user receives negative acknowledgment (NACK) treatment when trying to program an AIN feature access code during CFWP.
PRIB	NA	CFWP is not supported on PRI agents.
SDS	S	This trigger can be hit during CFWP
SFC	S	The SFC VSC or FAC cannot be stored as the forwarded-to party for CFWP features. Attempts to program the call forward number to an SFC access code result in negative acknowledge (NACK) treatment being applied without the forward-to number being updated.
SIT	NA	CFWP is not supported on trunk agents.
Specified_Carrier	UU	Not applicable
T_Busy	UU	Not applicable
T_NoA	UU	Not applicable
TAT	S	This trigger can be hit during CFWP.
TRA	S	The call can encounter trigger TRA during CFWP.
TKTERM	N/A	

23.2.5.2 Event interactions with CFWP

Table 252 provides event interactions with CFWP.

Table 252 Event interactions with CFWP

Event	Status	Interactions
Network_Busy	S	These events can be armed and detected during CFWP.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

23.2.5.3 Other interactions with CFWP

Table 253 provides other interactions with CFWP.

Table 253 Other interactions with CFWP

Other	Status	Interactions
Analyze_Route	S	Call forwarding activates when one of these responses is received from the SCP and the call is answered.
Forward_Call		
Authorize_Termination		
Continue		
disconnect	S	Call forwarding does not activate when the call is not answered or when this SCP response is received.
cancel resource event		
send to resource (response)		
Collect_Information	U	When parameter CollectedDigits contains the CFWP (with or without courtesy call) feature activation code, the SSP sends the call to FNAL treatment.
DisplayText	S	AIN DisplayText is displayed when the courtesy call is made.
ExtendedRinging	S	O_NoA can be encountered and ER applied, while the forwarded DN is ringing during CFWP. CFWP behavior is not affected by ER.

23.2.6 Call forwarding remote access

Call forwarding remote access (CFRA) allows a user with call forwarding universal (CFU), call forwarding intragroup (CFI) or call forwarding fixed (CFF) to activate CFU, CFI or CFF from a remote line through DISA. CFRA is activated when a user dials a DISA DN with the CFRA option, followed by the particular DN, an authorization code, an activation or deactivation code and, when required, the DN that calls are to be forwarded. However, unlike station-based invocation of call forwarding, CFRA does not make courtesy calls (that test the availability of the station or DN that calls are to be forwarded).

Interaction with AIN is as for DISA, with OCM triggers supported before termination to the DISA-CFRA DN.

For more information, see Section 24.5.1 , “Direct Inward System Access (DISA) features,” on page 967.

23.2.7 Call forwarding timed

The call forwarding timed (CFT) feature enhances CFB and CFD features for MDC lines, by routing unanswered forwarded calls to treatment after a predetermined time-out period. Treatment can consist of a tone or an announcement.

23.2.7.1 Trigger interactions with CFT

Table 254 provides trigger interactions with CFT.

Table 254 Trigger interactions with CFT

Trigger	Status	Interactions
AFR	These triggers have the same interactions as call forwarding. See Section 23.2 , “Call forwarding features,” on page 800.	
CDP		
International		
N11		
O_CPB	UU	Not applicable
O_NoA	UU	Not applicable

Table 254 Trigger interactions with CFT (Continued)

Trigger	Status	Interactions
OHD	These triggers have the same interactions as call forwarding. See Section 23.2 , “Call forwarding features,” on page 800.	
OHI		
One_Plus_Prefix		
Operator_Services		
PFC		
PRIB		
SDS		
SFC		
SIT		
Specified_Carrier		
T_Busy	UU	Not applicable
T_NoA	UU	Not applicable
TAT	These triggers have the same interactions as call forwarding. See Section 23.2 , “Call forwarding features,” on page 800.	
TRA	S	CFTD has the same interaction as CFD. See CFTD. CFTB has the same interaction as CFB. See CFB.
TKTERM	N/A	

23.2.7.2 Event interactions with CFT

Table 255 provides event interactions with CFT.

Table 255 Event interactions with CFT

Event	Status	Interactions
Network_Busy	These events have the same interactions as call forwarding. See Section 23.2 , “Call forwarding features,” on page 800.	
O_Answer		
O_CPB	UU	Not applicable
O_NoA	UU	Not applicable
T_Answer	These events have the same interactions as call forwarding. See Section 23.2 , “Call forwarding features,” on page 800.	

Table 255 Event interactions with CFT

Event	Status	Interactions
T_Busy	UU	Not applicable
T_NoA	UU	Not applicable

23.2.7.3 Other interactions with CFT

Table 256 provides other interactions with CFT.

Table 256 Other interactions with CFT

Description	Status	Interactions
This feature has the same interactions as call forwarding. See Section 23.2 , “Call forwarding features,” on page 800.		

23.2.8 Call forwarding validation for RES and IBN

Call forwarding validation (CFWVAL) provides a means of verifying that a line successfully forwards when a user activates call forwarding. The two types of CFWVAL follow:

- Termination validation - when termination validation is used, a call completes to the forward number.
- Routing validation - when routing validation is used, a confirmation tone is heard when the system determines that the call routes successfully and call forwarding is activated.

> ***Note:*** When AIN trigger criteria is met during routing validation, no further routing is performed, and no query is sent to the SCP. Call forwarding is activated and a confirmation tone is heard. When AIN criteria is not met, routing validation continues.

23.2.8.1 Trigger interactions with CFWVAL

Table 257 provides trigger interactions with CFWVAL.

Table 257 Trigger interactions with CFWVAL

Trigger	Status	Interactions for routing validation	Interactions for termination validation
AFR	S	This trigger can be hit	This trigger can be hit
CDP	S	This trigger cannot be hit. Routing validation is unsuccessful.	This trigger cannot be hit. Termination validation is unsuccessful.
International	S	This trigger can be hit.	This trigger can be hit.

Table 257 Trigger interactions with CFWVAL (Continued)

Trigger	Status	Interactions for routing validation	Interactions for termination validation
N11	S	This trigger can be hit	This trigger can be hit
O_CPB	UU	Not applicable	Not applicable
O_NoA	UU	Not applicable	Not applicable
OHD	S	This trigger can be hit	This trigger can be hit
OHI	S	OHI has precedence over CFWVAL.	
One_Plus_Prefix	S	This trigger can be hit.	This trigger can be hit.
Operator_Services	S	This trigger can be hit.	This trigger can be hit.
PFC	S	This trigger cannot be hit. Routing validation is unsuccessful.	This trigger cannot be hit. Termination validation is unsuccessful.
PRIB	NA	PRI agents do not support call forwarding.	
SDS	S	This trigger can be hit	This trigger can be hit
SFC	S	This trigger cannot be hit. Routing validation is unsuccessful.	This trigger cannot be hit. Termination validation is unsuccessful.
SIT	NA	Trunk agents do not support call forwarding.	
Specified_Carrier	S	This trigger can be hit.	This trigger can be hit.
T_Busy	S	Not applicable	This trigger can be hit
T_NoA	S	Not applicable	This trigger can be hit
TAT	S	This trigger can be hit	This trigger can be hit
TRA	S	Trigger TRA cannot be encountered during call forward routing validation.	TRA trigger can be encountered during call forward termination validation.
TKTERM	N/A	Not applicable	Not applicable

23.2.8.2 Event interactions with CFWVAL

Table 258 provides event interactions with CFWVAL.

Table 258 Event interactions with CFWVAL

Event	Status	Interactions
Network_Busy	PS	For calls that involve the attendant console, the NEL event is closed. A Close message with the CloseCause parameter set to “EDPs_completed” is sent to the SCP.
O_Answer	PS	
O_CPB	PS	
O_NoA	PS	
T_Answer	S	Terminating events can be encountered during CFWVAL.
T_Busy	S	
T_NoA	S	

23.2.8.3 Other interactions with CFWVAL

Table 259 provides other interactions with CFWVAL.

Table 259 Other interactions with CFWVAL

Event	Status	Interactions
ExtendedRinging	S	For CFWVAL with termination validation, the call can encounter O_NoA and when a STR message is received with ER, ringing is provided to the called DN. When the called DN answers, the programming succeeds (for example, validation passes). The called DN is not programmed (for example, validation fails) when a STR message is received with no ER parameter.

23.2.9 Miscellaneous

The following section describes miscellaneous information associated with call forwarding features.

23.2.9.1 Redirecting features for triggers O_CPB and O_NoA

Figure 118 on page 826 illustrates the initial state where only the first leg of the call is established. This initial state does not present any specific interaction. After redirection, triggers O_Called_Party_Busy and O_No_Answer can be detected on party A and not on party B.

Figure 118 First leg established

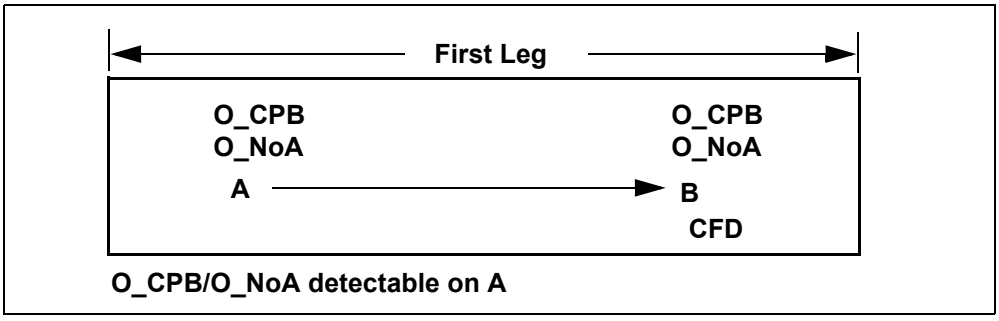


Figure 119 illustrates the establishment of the second leg of the call. Triggers OCPB and ONOA are detected on A after B redirects the call. Triggers OCPB and ONOA are not detected on B.

Figure 119 Second leg origination

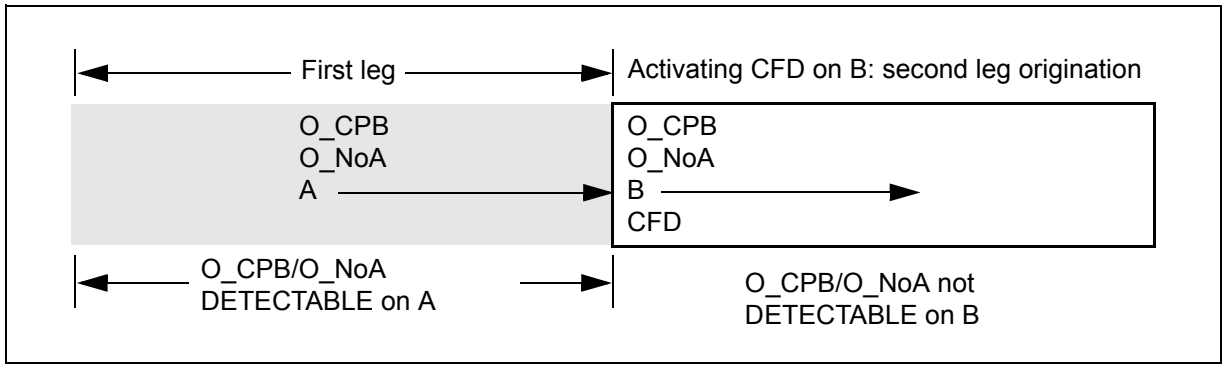


Table 260 illustrates parameters that are populated based on the forwarding station for originating and terminating triggers.

Table 260 Triggering after call forwarding—intra-switch

Parameter	Originating triggers	Terminating triggers
UserID	last forwarding station	terminating station
LATA	last forwarding station	terminating station
RedirectingPartyID (Note 1)	last forwarding station	last forwarding station
RedirectionInformation	last forwarding station	last forwarding station
Note 1: This parameter is only populated when the call has been forwarded more than once. When the call has been forwarded only once, only the OriginalCalledPartyID is populated with the forwarding station. ***Note 2:*** The population of parameter ChargeNumber is presented here for line-originated calls.The parameter population for trunk-originated calls is described previously in this section.		

Table 260 Triggering after call forwarding—intra-switch (Continued)

Parameter	Originating triggers	Terminating triggers
ChargeNumber (Note 2)	last forwarding station	last forwarding station
ChargePartyStationType	last forwarding station	last forwarding station
PrimaryCarrier	last forwarding station	not applicable
OriginalCalledPartyID	first forwarding station	first forwarding station
Note 1: This parameter is only populated when the call has been forwarded more than once. When the call has been forwarded only once, only the OriginalCalledPartyID is populated with the forwarding station. ***Note 2:*** The population of parameter ChargeNumber is presented here for line-originated calls.The parameter population for trunk-originated calls is described previously in this section.		

Table 261 illustrates the redirecting reason field population in parameter RedirectionInformation, based on the type of call forwarding feature encountered.

Table 261 Population of redirecting reason based on call forwarding type

Call forwarding type	Redirecting reason
CFU, CFI, CFF, CFW, CFK, SCF, RCF, CFXU	unconditional
CFB, CFBL, CBI, CBU, CBE, CBECBU, CFBL, CBICBU, IECFB, IECFBCBU	user busy
CFD, CFDA, CFGD, CFGDA, CFCW, CDECDU, CDI, CDE, CFDA, CDU, CDICDU, IECFD, IECFDCDU	no reply
CMCF, CFS, MULTICFA, MULTICFD, MULTICFB	dependent on the basic call forwarding feature used
Other	unknown or not available

Table 262 provides parameter population by station.

Table 262 Parameter population by station

Routing method	Does routing method affect the switch-based redirection counter?	Does routing method affect the redirection counter in the AIN query message?
AIN Forward_Call response	yes	yes
AIN Analyze_Route response	yes	yes
switch-based call forwarding feature	yes	yes

23.3 Call messenger features for RES

The call messenger feature allows an end user to access a messaging service after an unsuccessful local or 1+ toll call (call that was not answered or reached a busy destination). The call messenger feature routes the end user's call from the end office to either a traffic operator position system (TOPS) switch or an inter exchange carrier's (IEC) service gateway where the messaging service system is connected. The end user can then leave a message for a recipient with the messaging service. The call messenger feature can be invoked by two residence enhanced services (RES) access codes. This feature is also known as 1+ MDS and it compliments the 0+ MDS feature.

Call messenger does not provide the messaging service itself.

Two types of call messenger exist, they are as follows:

- intentional call messenger (ICMSG)
- standard call messenger (SCMSG)

23.3.1 Intentional call messenger

Intentional call messenger (ICMSG) automatically allows the caller to leave a message for the party of their choice. The caller does not have to attempt to reach the message recipient beforehand.

23.3.1.1 Trigger interactions with ICMSG

Table 263 provides trigger interactions with ICMSG.

Table 263 Trigger interactions with ICMSG

Trigger	Status	Interactions
AFR	PS	Originating triggers are not hit on ICMSG calls.
CDP	PS	
International	PS	
N11	PS	
O_CPB	UU	Not applicable
O_NoA	UU	Not applicable
OHD	PS	Originating triggers are not hit on ICMSG calls.
OHI	PS	
One_Plus_Prefix	PS	
Operator_Services	PS	
PFC	PS	
PRIB	PS	
SDS	PS	
SFC	PS	
SIT	PS	
Specified_Carrier	PS	
T_Busy	UU	Not applicable
T_NoA	UU	Not applicable
TAT	UU	Not applicable
TRA	UU	Not applicable
TKTERM	N/A	

23.3.1.2 Event interactions with ICMSG

Table 264 provides event interactions with ICMSG.

Table 264 Event interactions with ICMSG

Event	Status	Interactions
Network_Busy	UU	Not applicable
O_Answer	UU	
O_CPB	UU	
O_NoA	UU	
T_Answer	UU	
T_Busy	UU	
T_NoA	UU	

23.3.1.3 Other interactions with ICMSG

Table 265 provides other interactions with ICMSG.

Table 265 Other interactions with ICMSG

Description	Status	Interactions
Create_Call	S	When alerting the originator ICMSG does not activate.

23.3.2 Standard call messenger

Standard call messenger (SCMSG) automatically allows the caller to leave a message to the last party to whom the caller has tried to reach. SCMSG relies upon the contents of the outgoing call memory block.

Note: The SCMSG feature does not support AIN.

23.3.2.1 Trigger interactions with SCMSG

Table 266 provides trigger interactions with SCMSG.

Table 266 Trigger interactions with SCMSG

Trigger	Status	Interactions
AFR	PS	The original call made by the SCMSG subscriber can hit this trigger. This trigger is not hit on an SCMSG call leg.
CDP	PS	
International	PS	
N11	PS	

Table 266 Trigger interactions with SCMSG (Continued)

Trigger	Status	Interactions
O_CPB	UU	Not applicable
O_NoA	UU	Not applicable
OHD	PS	The original call made by the SCMSG subscriber can hit this trigger. This trigger is not hit on an SCMSG call leg.
OHI	PS	
One_Plus_Prefix	PS	
Operator_Services	PS	
PFC	PS	
PRIB	PS	
SDS	PS	
SFC	PS	
SIT	PS	
Specified_Carrier	PS	
T_Busy	UU	Not applicable
T_NoA	UU	Not applicable
TAT	UU	Not applicable
TRA	UU	Not applicable
TKTERM	N/A	

23.3.2.2 Event interactions with SCMSG

Table 267 provides event interactions with SCMSG.

Table 267 Event interactions with SCMSG

Event	Status	Interactions
Network_Busy	UU	Not applicable
O_Answer	UU	
O_CPB	UU	
O_NoA	UU	
T_Answer	UU	
T_Busy	UU	
T_NoA	UU	

23.3.2.3 Other interactions with SCMSG

Table 268 provides other interactions with SCMSG.

Table 268 Other interactions with SCMSG

Description	Status	Interactions
Analyze_Route	U	When a AIN query takes place and an Analyze_Route response is received, then the called party field of the OCM is marked as “DN UNUSABLE”. In this case, when standard call messenger is invoked, the call is sent to treatment or is provided with a new call messenger error announcement as specified in parameter CMSG.
Forward_Call	U	When a AIN query takes place and an Forward_Call response is received, then the called party field of the OCM is marked as “DN UNUSABLE”. In this case, when standard call messenger is invoked, the call is sent to treatment or is provided with a new call messenger error announcement as specified in parameter CMSG.
CallingPartyID	U	When an AIN query takes place and parameter CallingPartyID is received in the response message, this information is not taken into account by the standard call messenger feature. The calling number relayed to the messaging service does not reflect the calling number supplied by the SCP.
ChargePartyStationType	U	When an AIN query takes place and parameter ChargePartyStationType is received in the response message, this information is not taken into account by the standard call messenger feature.

Table 268 Other interactions with SCMSG

Description	Status	Interactions
Continue	U	SCMSG does not support the Continue response.
Create_Call	S	When alerting the originator SCMSG is not activated.

23.4 Call park and call pickup features

This section discusses call park and call pickup features. See Table 180 "DMS-100 features" on page 720 for a full list of call park and call pickup features.

23.4.1 Call park

Call park (CPK) allows a user to place an incoming call on hold. A held call is available to any station in the customer group.

23.4.1.1 Trigger interactions with CPK

Table 269 provides trigger interactions with CPK.

Table 269 Trigger interactions with CPK

Trigger	Status	Interactions
AFR	S	AIN triggers can be encountered until the CPK feature is activated. Once the CPK feature is activated, no AIN triggers can be encountered.
CDP	S	
International	S	
N11	S	
O_CPB	UU	Not applicable
O_NoA	UU	Not applicable

Table 269 Trigger interactions with CPK

Trigger	Status	Interactions
OHD	S	AIN triggers can be encountered until the CPK feature is activated. Once the CPK feature is activated, no AIN triggers can be encountered.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	UU	Not applicable
T_NoA	UU	Not applicable
TAT	S	Trigger Termination_Attempt takes precedence over the CPK feature. However, when routing continues (that is, the SCP returns an Authorize_Termination message), the call can encounter CPK.
TRA	UU	Not applicable
TKTERM	N/A	

23.4.1.2 Event interactions with CPK

Table 270 provides event interactions with CPK.

Table 270 Event interactions with CPK

Event	Status	Interactions
O_Disconnect	PS	AnyO_Disconnect event will be detected after the call is being parked, except when AIN controller and CPK controller are same. When any O_Disconnect event is armed in the call and the AIN controller tries to park the call, it will get FNAL treatment.
O_Disconnect_Called	PS	O_Disconnect_Called is not detected when the Call Parker (being the terminator) goes on-hook after parking the call. O_Disconnect_Called Event is detected when the final agent who picks up the parked call goes on-hook and suspend timer expires.
Timeout	PS	Any Timeout event will be detected after the call is being parked, except when AIN controller and CPK controller are same. When any Timeout event is armed in the call and the AIN controller tries to park the call, it will get FNAL treatment.
Network_Busy	UU	Not applicable
O_Answer	UU	
O_CPB	UU	
O_NoA	UU	
T_Answer	UU	
T_Busy	UU	
T_NoA	UU	

23.4.1.3 Other interactions with CPK

Table 271 provides other interactions with CPK.

Table 271 Other interactions with CPK

Description	Status	Interactions
CallingPartyBGID	S	On the terminating switch, an MBG call can be parked against the called party (CPK) or another station in the called party's customer group (DCPK). The call can then be retrieved (with call park retrieve) by any station in the same customer group. The customer group of the MBG call is specified in parameter BGID and corresponds to parameter CallingPartyBGID returned by the SCP.
DisplayText	S	When the call is unparked by the same agent who parked the call, the initial AIN display text information is displayed (for ISDN BRI NI1/NI2 only, the AIN display text callingAddress parameter is displayed). When the call is unparked by a different agent, the initial AIN display text information is not displayed. During call park recall, the initial AIN display text information is displayed (for ISDN BRI NI1/NI2 only, the AIN display text callingAddress parameter is displayed).

23.4.2 Directed call park

The Directed call park (DCPK) feature allows a user to park calls against any valid directory number (DN). The call can later be retrieved by any station.

Directed call park has the same interactions as CPK. See Section 23.4.1 on page 833.

23.4.3 Security code (directed call park)

The security code (SEC) is an option of DCPK. DCPK offers the user the flexibility of assigning an SEC so that only subscribers with knowledge of the valid SEC can retrieve the parked call.

Security code (directed call park) has the same interactions as CPK. See Section 23.4.1 on page 833.

23.4.4 Call park recall identification

Call park recall identification has the same interactions as CPK. See Section 23.4.1 "Call park" on page 833.

23.4.5 Call pickup

Call pickup (CPU) permits a station to answer incoming calls for another station in the same pickup group.

23.4.5.1 Trigger interactions with CPU

Table 272 provides trigger interactions with CPU.

Table 272 Trigger interactions with CPU

Trigger	Status	Interactions
AFR	S	These triggers can be hit on a call before it is picked up by CPU.
CDP	S	
International	S	
N11	S	
O_CPB	S	OCPB trigger that is subscribed to pickup station will not be hit when it goes offhook to pick up the call.
O_NoA	S	For intraswitch and interswitch calls, CPU is similar to an answer (but from a different terminating agent) that is transparent to the originator. On CPU this trigger is deactivated.
OHD	S	The trigger can be hit on a call before it is picked up by CPU. OHD trigger that is subscribed to the picked up station cannot be hit after activates CPU. CPU takes precedence over OHD. Note: OHD shows up in the traver even though OHD was not hit.
OHI	S	The trigger can be hit on a call before it is picked up by CPU OHI trigger that is subscribed to the picked up station takes precedence over CPU. The call cannot be picked up by the pickup station.
One_Plus_Prefix	S	These triggers can be hit on a call before it is picked up by CPU.
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	

Table 272 Trigger interactions with CPU (Continued)

Trigger	Status	Interactions
T_Busy	S	Trigger T_Busy does not apply to CPU.
T_NoA	S	When a call is answered using CPU, the call is treated as answered, and this trigger is not hit. The agent activating CPU will not encounter any terminating triggers. B is subscribed to T_NoA trigger. A calls B and T-TNOAnswer timer expires. T_No_Answer query is sent to the SCP. C picks up the call before the response is received from the SCP. This is treated as an answer and the response is ignored.
TAT	S	Trigger Termination_Attempt takes precedence over the switch-based CPU feature. However, when routing continues (that is, the SCP returns an Authorize_Termination message), the call can encounter CPU. The agent activating CPU will not encounter any terminating triggers.
TRA	S	The agent activating CPU does not encounter terminating triggers.
TKTERM	N/A	

23.4.5.2 Event interactions with CPU

Table 273 provides event interactions with CPU.

Table 273 Event interactions with CPU

Event	Status	Interactions
O_Disconnect	S	A call pickup on a call with an O_Disconnect event armed will be considered as an answer.
O_Disconnect_Called	S	A call pickup on a call with an O_Disconnect_Called event armed will be considered as an answer.
Timeout	S	A call pickup on a call with a Timeout event armed will be considered as an answer and corresponding timer is started.
Network_Busy	S	When a NEL is active on the call, and the call routes to a line that has the CPU option and is busy, the call will encounter the event. The CPU feature will proceed as normal.
O_Answer	S	The event is detected when the call is picked up. A notification and a ‘Close’ message are sent to the SCP.
O_CPB	S	When a NEL is active on the call, and the call routes to a line that has the CPU option and is busy, the call will encounter the event. The CPU feature will proceed as normal.

Table 273 Event interactions with CPU

Event	Status	Interactions
O_NoA	S	After the ONOA event is hit and before the SCP response is received, the call can be picked up. The event is closed with close cause eDPs completed when pickup station picks up the call before the ONOA timer expired.
T_Answer	S	The event is detected when the call is picked up. A notification and a 'Close' message are sent to the SCP.
T_Busy	S	When a NEL is active on the call, and the call routes to a line that has the CPU option and is busy, the call will encounter the event. The CPU feature will proceed as normal.
T_NoA	S	TNOA event is closed with close cause eDPs completed when pickup station picks up the call before the TNOA timer expired.

23.4.5.3 Other interactions with CPU

Table 274 provides other interactions with CPU.

Table 274 Other interactions with CPU

Description	Status	Interactions
Collect_Information	U	When the CollectedDigits parameter contains the CPU feature access code, the SSP sends the call to FNAL treatment.
CallingPartyBGID	S	On the terminating switch, an MBG call can be picked up by another station in the same customer group with DCBI option.The customer group of the MBG call is specified in the parameter BGID and corresponds to the parameter CallingPartyBGID returned by the SCP. The CallingPartyBGID in a response does not make a difference in allowing or disallowing CPU.
CallingPartyID	S	The CallingPartyID on the response will be displayed on the picked up station.
Offer_Call	NA	The T_Busy trigger cannot be encountered when the terminating line has CPU.
DisplayText	S	The party that performs the pickup will not receive any AIN DisplayText information.
Extended Ringing	S	CPU can be successfully invoked during ER.

Table 274 Other interactions with CPU

Description	Status	Interactions
Create_Call	S	When Create_Call alerts the originator, CPU can not retrieve the call.
DPConverter	PS	The Call pickup will be treated like an answer. If the Collect_Information message received from the SCP/Adjunct contains the DPConverter parameter, then the SSP will provide DP-to-DTMF conversion after the call has been picked up.

23.4.6 Directed call pickup

The directed call pickup (DCPU) option is the same as CPU, in that it allows a station to answer incoming calls to another station in the same pickup group. The difference with the DPCU option is that the pickup station must dial both the pickup code and the extension of the called/ringing station.

DCPU has the same interactions with AIN as CPU. See Section 23.4.5 “Call pickup” on page 836.

23.4.7 Directed call pickup with barge in

Other than as specified below, directed call pick up with barge in (DCBI) has the same interactions as CPU. See Section 23.4.5 “Call pickup” on page 836.

23.4.7.1 Other interactions with DCBI

Table 276 provides event interactions with DCBI.

Table 275 Event interactions with DCBI

Description	Status	Interactions
O_Disconnect	U	AIN is not in the supported features of DCBI. When any call which involves AIN tries to barge-in, it gets NACK treatment.
O_Disconnect_Called	U	
Timeout	U	

23.4.7.2 Other interactions with DCBI

Table 276 provides other interactions with DCBI.

Table 276 Other interactions with DCBI

Description	Status	Interactions
DPConverter	PS	The Call pickup will be treated like an answer. If the Collect_Information message received from the SCP/Adjunct contains the DPConverter parameter, then the SSP will provide DP-to-DTMF conversion after the call has been picked up.

23.4.8 Directed call pick up with non-barge in

Directed call pick up with non barge in (DCBU) allows an IBN station to use directed call pickup (DCPU) to answer a ringing line in the same customer group. The DCBU does not allow the station to barge-in on a line when DCPU answers a call.

DCBU has the same interactions as CPU. See Section 23.4.5 on page 836.

23.4.9 Trunk answer from any station

The trunk answer from any station (TAFAS) option allows answering of incoming attendant seeking calls from any station, when all attendant positions are unattended, by dialing an answer code in response to a common audible ringing device (bell or buzzer).

23.4.9.1 Trigger interactions with TAFAS

Table 277 provides trigger interactions with TAFAS.

Table 277 Trigger interactions with TAFAS

Trigger	Status	Interactions
AFR	S	When the TAFAS line is used as a terminating feature, AIN originating triggers do no apply. However, when the TAFAS line is a member of a MADN group, then the customer can use it as an originating agent and, in this case, the originating triggers can be encountered.
CDP	S	
BCM	S	
International	S	
N11	S	
O_CPB	UU	Not applicable
O_NoA	UU	Not applicable

Table 277 Trigger interactions with TAFAS

Trigger	Status	Interactions
OHD	S	When the TAFAS line is used as a terminating feature, AIN originating triggers do no apply. However, when the TAFAS line is a member of a MADN group, then the customer can use it as an originating agent and, in this case, the originating triggers can be encountered.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	UU	Not applicable
T_NoA	UU	Not applicable
TAT	S	Trigger TAT can be assigned to a TAFAS line so that any incoming call can encounter this trigger. When the TAFAS access code is dialed to pick up this call, no AIN triggers are encountered.
TRA	UU	Not applicable
TKTERM	N/A	

23.4.9.2 Event interactions with TAFAS

Table 278 provides event interactions with TAFAS.

Table 278 Event interactions with TAFAS

Event	Status	Interactions
Network_Busy	UU	Not applicable
O_Answer	UU	
O_CPB	UU	
O_NoA	UU	
T_Answer	UU	
T_Busy	UU	
T_NoA	UU	

23.5 Call transfer features

This section addresses the following call transfer features:

- blind transfer recall or identification
- call redirect (CRT)
- call transfer (CXR)
- MBS single button transfer (QCK)

23.5.1 Blind transfer recall or identification

Note: See Section 23.5.3 on page 850 for a description of call transfer and its effects.

23.5.1.1 Trigger interactions with blind transfer recall or identification

Table 279 provides trigger interactions with blind transfer recall or identification.

Table 279 Trigger interactions with blind transfer recall or identification

Trigger	Status	Interactions
AFR	S	Calls that have encountered AIN triggers can subsequently be transferred using call transfer. While being transferred, the new leg of the call can hit these triggers. On the recall leg, no AIN TDPs are hit, and no previous AIN response parameters are used or preserved.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	Calls that have encountered AIN triggers can subsequently be transferred using call transfer. On the recall leg, no AIN TDPs are hit, and no previous AIN response parameters are used or preserved.
One_Plus_Prefix	S	Calls that have encountered AIN triggers can subsequently be transferred using call transfer. While being transferred, the new leg of the call can hit these triggers. On the recall leg, no AIN TDPs are hit, and no previous AIN response parameters are used or preserved.
Operator_Services	S	
PFC	S	
PRIB	NA	Call transfer is not supported on PRI agents.
SDS	S	Calls that have encountered AIN triggers can subsequently be transferred using call transfer. While being transferred, the new leg of the call can hit these triggers. On the recall leg, no AIN TDPs are hit, and no previous AIN response parameters are used or preserved.
SFC	S	
SIT	NA	Call transfer is not supported on trunk agents.
Specified_Carrier	S	Calls that have encountered AIN triggers can subsequently be transferred using call transfer. While being transferred, the new leg of the call can hit this trigger. On the recall leg, no AIN TDPs are hit, and no previous AIN response parameters are used or preserved.
T_Busy	S	
T_NoA	S	
TAT	S	

Table 279 Trigger interactions with blind transfer recall or identification (Continued)

Trigger	Status	Interactions
TRA	S	Calls that encounter AIN triggers can be transfer using call transfer. While being transferred, the new leg of the call can encounter trigger TRA. On the recall leg, no AIN triggers are hit, and no previous AIN response parameters are used or preserved.
TKTERM	N/A	

23.5.1.2 Event interactions with blind transfer recall or identification

Table 280 provides event interactions with Blind transfer recall or identification.

Table 280 Event interactions with blind transfer recall or identification

Event	Status	Interactions
O_Disconnect	PS	Any O_Disconnect event will be detected after call is being transferred using BTR, except when CXR controller and AIN controller are same. When the AIN controller is trying to invoke BTR, FNAL treatment will be given. When call is transferred using a switch based feature and O_Disconnect event armed in the first call, the O_Disconnect event will be transferred to the resulting call. Also if there is a CPH event armed in the second call, then the sequence of the events detected after the call is transferred will not be in the sequence in which they were armed.
O_Disconnect_Called	PS	Any O_Disconnect_Called event will be detected after call is being transferred using BTR, except when CXR controller and AIN controller are same. When the AIN controller is trying to invoke BTR, FNAL treatment will be given. When call is transferred using a switch based feature and O_Disconnect_Called event armed in the first call, the O_Disconnect_called event will be transferred to the resulting call. Also if there is a CPH event armed in the second call, then the sequence of the events detected after the call is transferred will not be in the sequence in which they were armed.
Timeout	PS	Any Timeout event will be detected after call is being transferred using BTR, except when CXR controller and AIN controller are same. When the AIN controller is trying to invoke BTR, FNAL treatment will be given.

Table 280 Event interactions with blind transfer recall or identification

Event	Status	Interactions
Network_Busy	S	Calls that have armed/detected AIN events can subsequently be transferred using call transfer. While being transferred, the new call leg can arm/detect AIN events. On the recall leg, no AIN events can be armed, since no AIN triggers can be hit
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

23.5.1.3 Other interactions with blind transfer recall or identification

Table 281 provides other interactions with Blind transfer recall or identification.

Table 281 Other interactions with blind transfer recall or identification

Description	Status	Interactions
CallingPartyID	S	When parameter CallingPartyID is returned in an AIN response, the display is updated accordingly on the terminating DN.
PassiveLegTreatment	S	When a PassiveLegTreatment is specified in an AIN response, it applies only while the transferring party is still part of the call. As soon as the transferring party goes on-hook, these treatments are no longer applied to the terminating DN.
ControllingLegTreatment	S	When a ControllingLegTreatment is specified in an AIN response, it applies only while the transferring party is still part of the call. As soon as the transferring party goes on-hook, these treatments are no longer applied to the terminating DN.
Billing	S	When a transferred call encounters a SDS trigger with an Analyze_Route or continue response with an AMASLPID, an AMA record is generated when the call is answered. This also occurs when the transferred call encounters Termination_Attempt with a forward call or authorize termination response. However, when the transferred call goes unanswered and the transferring party answers on recall, an erroneous AMA record with COMPLETION_IND set to ANSWERED is generated. send notification/termination notification (SN/TN) is affected similarly when the transferred call goes unanswered.

Table 281 Other interactions with blind transfer recall or identification

Description	Status	Interactions
DisplayText	S	On blind transfer calls to RES sets in which recall occurs to a set that had received AIN DisplayText, AIN DisplayText will be restored. The DisplayText will not be restored for any other set types.
Extended Ringing	S	Trigger O_NoA or T_NoA can only be hit before the controller transfers the call. These triggers cannot be hit once the call transfer subscriber leaves the call.

23.5.2 Call redirect

Call redirect (CRT) allows residential end users with the capability to transfer calls to a pre-defined routing directory number. The transfer is made when the end user flashes and dials an access code (for example, #9 or *9) during an established two-party call. Upon successful activation of the CRT feature, the end user routes to confirmation treatment. The operating company defines the confirmation treatment. Only the terminator in a two party call can activate CRT.

Note 1: No AIN interaction on the call occurs between the other party (the party talking to CRT controller when CRT is activated) and the routing DN.

Note 2: CRT does not allow the controller to redirect an incoming call to a voicemail system.

23.5.2.1 Trigger interactions with CRT

Table 282 provides trigger interactions with CRT.

Table 282 Trigger interactions with CRT

Trigger	Status	Interactions
AFR	S	The call cannot hit this trigger when the other party (party talking to CRT controller when CRT is activated) is talking to the CRT controller (the end user who activates the CRT feature).
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	

Table 282 Trigger interactions with CRT

Trigger	Status	Interactions
OHI	S	When the CRT controller subscribes to this trigger, OHI takes precedence and the CRT controller cannot activate the CRT feature.
One_Plus_Prefix	S	The call cannot hit this trigger when the other party (party talking to CRT controller when CRT is activated) is talking to the CRT controller (the end user who activates the CRT feature).
Operator_services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	UU	Not applicable
TKTERM	N/A	

23.5.2.2 Event interactions with CRT

Table 283 provides event interactions with CRT.

Table 283 Event interactions with CRT

Event	Status	Interactions
Network_Busy	UU	The call can arm and detect this event when the CRT controller subscribes to trigger OHI.
O_Answer	UU	
O_CPB	UU	
O_NoA	UU	
T_Answer	UU	
T_Busy	UU	
T_NoA	UU	

23.5.2.3 Other interactions with CRT

Table 284 provides other interactions with CRT.

Table 284 Other interactions with CRT

Description	Status	Interactions
Collect_Info	U	When this response contains the CRT access code in the Collected_Digits field, the response cannot activate CRT. The call goes to Feature Not Allowed (FNAL) treatment.

23.5.3 Call transfer

Call transfer allows a subscriber to connect an existing call with a new party.

Note: For call transfer scenarios where a conference is established between the three parties, see Section 2.11 “Three-way calling features” on page 236.

23.5.3.1 Trigger interactions with CXR

Table 285 provides trigger interactions with CXR.

Table 285 Trigger interactions with CXR

Trigger	Status	Interactions
AFR	S	During the 2nd leg of a call transfer, these trigger can be hit.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	PS	Trigger O_NoA can only be hit before the controller transfers the call. This trigger cannot be hit once the call transfer subscriber leaves the call.

Table 285 Trigger interactions with CXR

Trigger	Status	Interactions
OHD	S	During the 2nd leg of a call transfer, these trigger can be hit.
OHI	S	
One_Plus_Prefix	S	
Operator_services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	PS	Trigger T_NoA can be hit before or after the controller transfers the call.
TAT	S	During the 2nd leg of a call transfer, this trigger can be hit.
TRA	S	During the second leg of CXR, the call can encounter trigger TRA.
TKTERM	N/A	

23.5.3.2 Event interactions with CXR

Table 286 provides event interactions with CXR.

Table 286 Event interactions with CXR

Event	Status	Interactions
O_Disconnect	PS	Any O_Disconnect event will be detected after a call is being transferred using CXR, except when the CXR controller and AIN controller are the same. When the AIN controller is trying to invoke CXR, FNAL treatment will be given. When a CXR controller tries to arm an O_Disconnect event, AINF treatment will be given. When call is transferred using a switch based feature and O_Disconnect event armed in the first call, the O_Disconnect event will be transferred to the resulting call. Also if there is a CPH event armed in the second call, then the sequence of the events detected after the call is transferred will not be in the sequence in which they were armed.
O_Disconnect_Called	PS	Any O_Disconnect_Called event will be detected after a call is being transferred using CXR, except when the CXR controller and AIN controller are the same. When the AIN controller is trying to invoke CXR, FNAL treatment will be given. When a CXR controller tries to arm an O_Disconnect_Called event, AINF treatment will be given. When call is transferred using a switch based feature and O_Disconnect_Called event armed in the first call, the O_Disconnect_called event will be transferred to the resulting call. Also if there is a CPH event armed in the second call, then the sequence of the events detected after the call is transferred will not be in the sequence in which they were armed.
Timeout	PS	Any Timeout event will be detected after a call is being transferred using CXR, except when the CXR controller and AIN controller are the same. When the AIN controller is trying to invoke CXR, FNAL treatment will be given. When a CXR controller tries to arm a Timeout event, AINF treatment will be given. When Timeout in OCM is armed in an established CXR, and the Timeout timer expires, if an Analyze Route, Collect Information, or Send To Resource response is received in response to the timer expiry, and this response tries to tearforward the conference controller, an unexpected communication is sent from the SSP to the SCP.
Network_Busy	S	This event can be armed and detected during a CXR.
O_Answer	S	This event can only be detected before the controller transfers (or leaves) the call. When the controller transfers the call before the terminator answers, a close message with closecause=callTerminated is sent to the SCP.

Table 286 Event interactions with CXR (Continued)

Event	Status	Interactions
O_CPB	S	This event can be armed and detected by the controller during the second leg of a CXR.
O_NoA	PS	This event can be detected only before the controller transfers (or leaves) the call. When the controller transfers the call before the terminator answers, a close message with closecause=callTerminated will be sent to the SCP.
T_Answer	PS	When the controller of the call conferences the originator of the 1st leg of the call while this event is armed, it is closed with CloseCause = EDPs_completed immediately. When the controller of the call transfers the originator to the terminator while this event is armed, the event will close with CloseCause = callTerminated. This event can be detected when the terminator answers the call before the controller has left the call.
T_Busy	S	This event can be armed and detected during a Call Transfer.
T_NoA	PS	This event can only be detected before the controller transfers (or leaves) the call. When the controller transfers the call before the terminator answers, a close message with closecause=callTerminated will be sent to the SCP.

23.5.3.3 Other interactions with CXR

Table 287 provides other interactions with CXR.

Table 287 Other interactions with CXR

Description	Status	Interactions
CallingPartyId	S	The CallingPartyID (CPID) received during the 1st call leg is not used during the 2nd call leg. A CPID parameter received during the second call leg interacts as follows: • when the transferred-to agent is an IBN or RES set, the AIN CPID data is displayed, but can be changed when — the controller transfers (by bridging and hanging up) before the terminator answers, the terminator's display is updated with the controller's DN — the controller transfers (by hanging up) before the terminator answers, the terminator's display is not updated (still shows DT info) — the controller bridges or transfers the call after the terminator has answered, the terminator's display is not updated • when the transferred-to agent is an EBS set, the AIN CPID data is displayed, but can be changed when — the controller bridges, the terminator's display is updated with the word CONFERENCE — the controller leaves the call, the terminator's display is updated with the originator's DN

Table 287 Other interactions with CXR (Continued)

Description	Status	Interactions
DisplayText	PS	DisplayText received during the 1st call leg is not used during the 2nd call leg. A displaytext parameter received during the second call leg interacts as follows: • when the transferred-to agent is an IBN or RES set, the AIN displaytext data is displayed, but can be changed when — the controller transfers (by bridging and hanging up) before the terminator answers, the terminator's display is updated with the controller's DN — the controller transfers (by hanging up) before the terminator answers, the terminator's display is not updated (still shows DT info) — the controller bridges or transfers the call after the terminator has answered, the terminator's display is not updated • when the transferred-to agent is an EBS set, the AIN displaytext data is displayed, but can be changed when — the controller bridges, the terminator's display is updated with the word CONFERENCE — the controller leaves the call, the terminator's display is updated with the originator's DN
STR/IP	PS	While the call is connected to the IP, the call cannot be transferred. All transfer attempts are ignored.

23.5.4 MBS single button transfer

MBS single button transfer (QCK) applies a directory number

(DN) to a key. When the user presses this feature during a two-party call, a 3WC is established.

23.5.4.1 Trigger interactions with QCK

Table 288 provides trigger interactions with QCK.

Table 288 Trigger interactions with QCK

Trigger	Status	Interactions
AFR	UU	Not applicable
CDP	UU	
International	UU	
N11	UU	
O_CPB	UU	
O_NoA	UU	
OHD	S	Calls transferred using QCK can hit this trigger.
OHI	UU	Not applicable
One_Plus_Prefix	UU	
Operator_Services	UU	
PFC	UU	
PRIB	NA	QCK is not supported on PRI agents.
SDS	UU	Not applicable
SFC	UU	
SIT	NA	QCK is not supported on trunk agents.
Specified_Carrier	UU	Not applicable
T_Busy	UU	
T_NoA	UU	
TAT	UU	
TRA	UU	
TKTERM	N/A	

23.5.4.2 Event interactions with QCK

Table 289 provides event interactions with QCK.

Table 289 Event interactions with QCK

Event	Status	Interactions
Network_Busy	UU	Not applicable
O_Answer	UU	
O_CPB	UU	
O_NoA	UU	
T_Answer	UU	
T_Busy	UU	
T_NoA	UU	
O_Disconnect	PS	Any O_Disconnect event will be detected after call is being conferenced using QCK, except when the conference controller and the AIN controller are the same. If the AIN controller is trying to invoke QCK, FNAL treatment is given.
O_Disconnect_Called	PS	Any O_Disconnect_Called event will be detected after call is being conferenced using QCK, except when the conference controller and the AIN controller are the same. If the AIN controller is trying to invoke QCK, FNAL treatment is given.
Timeout	PS	Any Timeout event will be detected after call is being conferenced using QCK, except when the conference controller and the AIN controller are the same. If the AIN controller is trying to invoke QCK, FNAL treatment is given.

23.6 Call waiting features

This section describes interactions with switch-based call waiting features. Table 180 “DMS-100 features” on page 720 for a complete list of switch-based call waiting features.

23.6.1 Call waiting

The call waiting (CWT) feature is a terminating service that informs a busy station user, by a burst of tone, that another call is waiting.

23.6.1.1 Trigger interactions with CWT

Table 290 provides trigger interactions with CWT.

Table 290 Trigger interactions with CWT

Trigger	Status	Interactions
AFR	S	A call that hits these triggers can encounter CWT. A call placed from a line with CWT can hit these triggers.
CDP	S	
International	S	
N11	S	
O_CPB	S	For intraswitch and interswitch calls, this trigger supports CWT. During a call attempt, this trigger can be hit when the terminating agent is busy and has subscribed to the CWT option. A terminating line that has subscribed to the CWT option is considered busy when an attempt is made to call the terminating agent that has one party connected to the first line and a second party that is already on hold to the second line. During a call attempt, this trigger can be hit when the terminating agent is busy and has subscribed to the CWT option and has activated the CCW option. A terminating line that has subscribed to the CWT option is considered busy when an attempt is made to call the terminating agent while one party is connected and the CCW option is active. The call hits this trigger when a CWT subscriber receives a third call while busy on one call with another call on hold. A call hits this trigger when a CWT subscriber receives a call while busy on one call and CCW was activated prior to the call.
O_NoA	S	For intraswitch and interswitch calls, this trigger supports call waiting. During a call attempt, this trigger is detected when the terminating agent is already connected to another party and has subscribed to the CWT option. When, for the same call attempt the terminating agent has activated the CCW option, the originator receives a busy indication and the timer for this trigger does not start. A call hits this trigger when a CWT subscriber receives a call while busy on another call and does not flash to answer the second call.

Table 290 Trigger interactions with CWT (Continued)

Trigger	Status	Interactions
OHD	S	A call that hits these triggers can encounter CWT. A call placed from a line with CWT can hit these triggers.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	A call can encounter CWT following a Continue or Offer_Call response from a T_Busy.
T_NoA	S	When a terminating party is subscribed to CWT and to trigger T_NoA, the T_NoA timer is started when an incoming party is on the inactive leg of the call. When the called party flashes, one of the following activities occurs: • to answer the incoming call the T_No_Answer timer is deactivated and no query is sent • after the T_No_Answer timer has expired, but before the SCP's response is received, the response is discarded once it is received When the called party does not answer before the T_NoA timer expires, a query is sent to the SCP. When the called party does not respond before the SCP response is received, the response is processed. When the response received is anything other than Continue, the incoming call is disconnected and the Call Waiting tones are stopped.
TAT	S	Trigger TAT takes precedence over this feature. However, when the call triggers and the SCP responds with an Authorize_Termination message, the call can encounter Call waiting.

Table 290 Trigger interactions with CWT (Continued)

Trigger	Status	Interactions
TRA	S	A call can encounter trigger TRA when the terminator is subscribed to CWT and the call can be waited. TBusy takes precedence over trigger TRA when the terminator is subscribed to CWT, the terminator is busy, and the call can be waited The call will encounter trigger TRA upon receiving a Continue/Offercall response after a T_Busy trigger when the terminator subscribed to CWT is busy and the call can be offered.
TKTERM	N/A	

23.6.1.2 Event interactions with CWT

Table 291 provides event interactions with CWT.

Table 291 Event interactions with CWT

Event	Status	Interactions
Network_Busy	S	This event can be armed and detected on a call that encounters CWT.
O_Answer	S	
O_CPB	S	This event can be armed and detected on a call that encounters CWT. Note: O_CPB is detected only when a call is already waiting.
O_Disconnect	PS	When the Disconnect message is received in response to an O_Disconnect EDP-R message, AIND treatment is applied to the CPH Controller and then normal switch feature processing is allowed to control the disposition of the call. The functionality will be similar to Continue type processing. If CHD is present on a terminator which has CWT, then the interaction will be similar to CHD. The O_Disconnect event armed will be closed if the call lands on a busy agent who has CWT and CHD.

Table 291 Event interactions with CWT

Event	Status	Interactions
O_Disconnect_Called	PS	When the Disconnect message is received in response to an O_Disconnect_Called EDP-R message, AIND treatment is applied to the CPH Controller and then normal switch feature processing is allowed to control the disposition of the call. The functionality will be similar to Continue type processing. If CHD is present on a terminator which has CWT, then the interaction will be similar to CHD. The O_Disconnect_Called event armed will be closed if the call lands on a busy agent who has CWT and CHD.
Timeout	PS	When the Disconnect message is received in response to an Timeout EDP-R message, AIND treatment is applied to the CPH Controller and then normal switch feature processing is allowed to control the disposition of the call. The functionality will be similar to Continue type processing. If CHD is present on a terminator which has CWT, then the interaction will be similar to CHD. The Timeout event armed will be closed if the call lands on a busy agent who has CWT and CHD.
O_NoA	S	This event can be armed and detected on a call that encounters CWT.
T_Answer	S	
T_Busy	S	T_Busy event takes precedence over the CWT feature. Tbusy event is encountered before CWT. A call can encounter CWT following a Continue or Offer_Call response from a T_Busy.
T_NoA	S	This event can be armed and detected on a call that encounters CWT.

23.6.1.3 Other interactions with CWT

Table 292 provides other interactions with CWT.

Table 292 Other interactions with CWT

Description	Status	Interactions
Continue	S	CWT is encountered when all of the following conditions are met: • the called party is served by a non-ISDN line subscribed to CWT or the calling party is subscribed to CWO/CWD • the call waiting service is inactive (for example, no call is waiting) • the call waiting feature was not deactivated by the called party (CCW is not active)
ControllingLegTreatment & PassiveLegTreatment	PS	When one of these parameters is present in a response from the SCP, the tones specified in these parameters is used instead of the switch-based call waiting tones. See Section 21.4.1 “AIN distinctive alerting” on page 730 and Section 21.4.2 “AIN distinctive alerting and call waiting” on page 732. ***Note:*** When a call that provides parameter ControllingLegTreatment or PassiveLegTreatment is attempted to a busy party with call waiting (CWT), the ControllingLegTreatment or PassiveLegTreatment is applied only as a distinctive call waiting tone. When the called party goes on hook before answering the waiting call, then parameter ControllingLegTreatment or PassiveLegTreatment is no longer applied. Instead, the called party receives normal ringing or switch-based distinctive ringing when necessary, reminding the called party of the presence of an unanswered call.
DisplayText	S	When toggling back and forth between callers, the AIN DisplayText is updated each time to reflect the present caller’s DisplayText.
ExtendedRinging	S	When ER is applied to a call that terminates on an agent subscribed to CWT, the CWT subscriber hears the alerting tone and is able to hook-flash (placing the current call on hold) to accept the new call. When a CWT subscriber is the originator of a call and is in an audible ringing, play announcement or collect digit state, the subscriber is not alerted to other incoming calls and the incoming caller receives busy treatment.

Table 292 Other interactions with CWT (Continued)

Description	Status	Interactions
Offer_Call	S	CWT is encountered when all of the following conditions are met: • the called party is served by a non-ISDN line subscribed to CWT or the calling party is subscribed to CWO/CWD • the call waiting service is inactive (for example, no call is waiting) • the call waiting feature was not deactivated by the called party (CCW is not active)
Monitor_For_Change request for lines	S	See Table 82 “Interaction between MFC for lines and call waiting/cancel call waiting” on page 301.
Monitor_For_Change request for hunt groups	S	Call Waiting is subscribed on the pilot of the hunt group and the call waits on the last member of the hunt group. Monitor resources determines whether the hunt group is busy or idle based on the following conditions: • The hunt group is considered idle when no call is on hold on the last member and all members are in busy state. • The hunt group is considered busy when there is a call on hold on the last member of the hunt group and all the members are in busy state.
Create_Call	S	When Create_Call alerts the originator CWT can not activate on a subsequent incoming call. When Create_Call determines that the originator is busy, CWT can not activate.
DPConverter	S	When the call is waited on the originating line and a Collect_Information message received from the SCP/Adjunct contains the DPConverter parameter = TRUE, if the originating line flashes to accept the call, then the SSP will not perform DP-to-DTMF conversion for the second call leg. If the originator flashes again to re-connect to the original terminator, the SSP will restore the DP-to-DTMF conversion for this call leg.
Connect_To_Resource	S	AIN/CPH controller cannot invoke Callwait when connected to the resource. The agent attemping to call the AIN/CPH controller, when connected to resource, will hear a busy treatment. When an agent subscribed to CWT is connected to the resource and a call waiting call lands on the agent, busy treatment is given to the calling agent of the CWT call.

23.6.2 Call waiting intragroup

Call waiting intragroup (CWI) is similar to CWT, but is possible within customer groups only.

Call waiting intragroup has the same interactions as CWT. See Section 23.6.1 on page 857.

23.6.3 Call waiting chaining

Call waiting chaining (CWC) provides the capability to chain together CWT calls to non-controlling CWT parties. When two parties are talking, the party that is offered a second incoming call is the CWT controller and the other party of the established call and the waiting party of the second call are non-controllers.

CWC has the same interactions as CWT. See CWT.

23.6.4 Call waiting conference

The call waiting conference (CWTC) feature provides conference functionality to CWT users by providing the capability to join a calling party onto an existing two-party call.

23.6.4.1 Trigger interactions with CWCT

Table 293 provides trigger interactions with CWCT.

Table 293 Trigger interactions with CWCT

Trigger	Status	Interactions
AFR	S	When CWTC is active, calls do not hit triggers.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	See CWT.
TKTERM	N/A	

23.6.4.2 Event interactions with CWCT

Table 294 provides event interactions with CWCT.

Table 294 Event interactions with CWCT

Event	Status	Interactions
Network_Busy	S	When CWTC is active, calls do not hit events.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	
O_Disconnect	PS	Same as 3WC
O_Disconnect_Called	PS	Same as 3WC
Timeout	PS	Same as 3WC

23.6.4.3 Other interactions with CWCT

Table 295 provides other interactions with CWCT.

Table 295 Other interactions with CWCT

Event	Status	Interactions
DPConverter	S	When the Collect_Information message received from the SCP/Adjunct contains the DPConverter parameter, then the SSP will provide DP-to-DTMF conversion after the call has been placed into a conference.

23.6.5 Call waiting originating

The call waiting originating (CWO) feature allows the calling party to impose call waiting on a busy called station.

23.6.5.1 Trigger interactions with CWO

Table 296 provides trigger interactions with CWO.

Table 296 Trigger interactions with CWO

Trigger	Status	Interactions
AFR	S	When this trigger is hit CWO is still applicable.
CDP	S	
International	UU	Not applicable
N11	S	When this trigger is hit CWO is still applicable.
O_CPB	UU	Not applicable
O_NoA	UU	Not applicable
OHD	S	When this trigger is hit CWO is still applicable.
OHI	S	
One_Plus_Prefix	UU	Not applicable
Operator_Services	UU	
PFC	UU	
PRIB	NA	CWO is not supported on PRI agents.
SDS	S	When this trigger is hit CWO is still applicable.
SFC	UU	Not applicable
SIT	NA	CWO is not supported on trunk agents
Specified_Carrier	UU	Not applicable
T_Busy	PS	This trigger has precedence over the CWO feature. The T_Busy trigger is encountered before CWO. This is a non-compliancy towards GR1298 R-[763].
T_NoA	S	Any call to a terminator that subscribes to the Call Waiting Originating can encounter the T_No_Answer trigger when applicable.
TAT	S	Trigger TAT takes precedence over this feature. However, when the call triggers and the SCP responds with an TAT message, the call can encounter CWO.

Table 296 Trigger interactions with CWO

Trigger	Status	Interactions
TRA	PS	Calls originated with the CWO option can encounter trigger TRA when the terminating agent is idle. Calls originated with the CWO option will not encounter trigger TRA when the terminating agent is busy and a second call is not waiting on the terminating agent. When a terminator that subscribed to both triggers TRA and T_Busy is busy, and a second call is originated with the CWO option, T_Busy takes precedence over trigger TRA. A T_Busy query is sent to the SCP. Upon receiving a Continue response for the T_Busy query, the call does not encounter trigger TRA. The call encounters CWO and the terminator receives call waiting tones.
TKTERM	N/A	

23.6.5.2 Event interactions with CWO

Table 297 provides event interactions with CWO.

Table 297 Event interactions with CWO

Event	Status	Interactions
O_Disconnect	PS	Same as CWT
O_Disconnect_Called	PS	Same as CWT
Timeout	PS	Same as CWT
Network_Busy	S	Calls originated from a CWO subscriber, can encounter this event.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	UU	Not applicable

Table 297 Event interactions with CWO (Continued)

Event	Status	Interactions
T_Busy	PS	Calls originated from the party subscribing to the Call Waiting Origination (CWO) feature will encounter T_Busy when applicable. The T_Busy event takes precedence over the CWO feature. The T_Busy event is encountered before CWO. Since the T_Busy event has precedence over CWO and CWD, this is a non-compliancy towards requirement R-[763] of GR1298, Issue 3, revision 1.
T_NoA	S	Calls originated form a CWO subscriber, can encounter this event.

23.6.5.3 Other interactions with CWO

Table 298 provides other interactions with CWO.

Table 298 Other interactions with CWO

Description	Status	Interactions
Offer_Call	S	A call originated with CWO/CWD is handled in the same way as though the terminating agent has CWT.
DisplayText	PS	AIN DisplayText is not delivered to IBN agents but is delivered to MBS/EBS agents. AIN DisplayText information is only delivered to IBN agents on call waiting ringback.
DPConverter	S	When the call is waited on the originating line and a Collect_Information message received from the SCP/Adjunct contains the DPConverter parameter = TRUE, if the originating line flashes to accept the call, then the SSP will not perform DP-to-DTMF conversion for the second call leg. If the originator flashes again to re-connect to the original terminator, the SSP will restore the DP-to-DTMF conversion for this call leg.

23.6.6 Cancel call waiting

Cancel call waiting (CCW) is an addition to the CWT feature and provides the CWT subscriber with the ability to disable the CWT feature for the duration of the call. There are two ways of activating CCW, before establishing a call and while in talking state.

When activating CCW before establishing a call, the user goes offhook, dials the CCW access code, waits to receive a confirmation tone, and when received, dials the destination number. After the feature is activated, the call continues with normal call processing

When activating CCW while in a talking state, the end user flashes the switch hook, causing the current connection to be placed on hold. A special dial tone is returned and the end user dials the access code. After a 300 ms delay, the original connection is reestablished.

23.6.6.1 Trigger interactions with CCW

Table 299 provides trigger interactions with CCW.

Table 299 Trigger interactions with CCW

Trigger	Status	Interactions
AFR	S	A call that hits these triggers can encounter CCW. When activating CCW before a call, these triggers can subsequently be hit on that call.
CDP	S	
International	S	
N11	S	
O_CPB	S	For intraswitch and interswitch calls, it is possible for O_Called_Party_Busy trigger to be detected when originating agent has subscribed to O_CPB trigger and terminating agent has subscribed to CCW feature. A CWT line is busy (the O_Called_Party_Busy trigger is detected) when the originating agent calls a terminating agent that has one party connected and the second line is on hold or the terminating agent has Cancel Call Waiting activated on its line.
O_NoA	S	For intraswitch and interswitch calls, it is possible for O_No_Answer trigger to be detected when originating agent has subscribed to O_NoA trigger and terminating agent has subscribed to CCW feature.
OHD	S	The cancel call waiting feature access code is treated like any other switch-based feature access code. Calls with switch-based vertical service codes or feature access codes escape from the InformationCollected TDP. When activating CCW before a call, the CCW access code does not trigger at OHD, but the dialed digits can trigger at OHD. When activating CCW while in the talking state, the CCW feature access code does not trigger at OHD.
OHI	S	When activating CCW before a call, the OHI trigger takes precedence and the CCW feature is not encountered. When activating CCW during a call, the call does not encounter OHI, unless the originator subscribes to call transfer, 3-way calling, or other conference features. In the case where OHI is hit, the CCW feature is not encountered.

Table 299 Trigger interactions with CCW

Trigger	Status	Interactions
One_Plus_Prefix	S	A call that hits these triggers can encounter CCW. When activating CCW before a call, these triggers can subsequently be hit on that call.
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	Trigger T_Busy is detected when the terminating agent has subscribed to T_Busy trigger and the terminating agent has subscribed to the CCW feature. When CCW is detected at T_Busy query population time, the busy type parameter is populated with “CallCannotBeOffered”.
T_NoA	UU	Not applicable
TAT	S	Trigger TAT takes precedence over this feature. However, when the call triggers and the SCP responds with an Authorize_Termination message, the call can encounter CCW.
TRA	S	A call will not encounter trigger TRA when the terminator subscribed to CWT and CCW is active, and the terminator is busy. The call will not encounter trigger TRA upon receiving a Continue/Offercall response after a T_Busy trigger, when the terminator is subscribed to CWT and CCW and is active.
TKTERM	N/A	

23.6.6.2 Event interactions with CCW

Table 300 provides event interactions with CCW.

Table 300 Event interactions with CCW

Event	Status	Interactions
Network_Busy	S	A call that arms and detects this event can encounter CCW.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	The T_Busy event takes precedence over the CCW feature. The T_Busy event is encountered before CCW. When CCW is detected at T_Busy query population time, the busy type parameter is populated with “CallCannotBeOffered”.
T_NoA	S	A call that arms and detects this event can encounter CCW.

23.6.6.3 Other interactions with CCW

Table 301 provides other interactions with CCW.

Table 301 Other interactions with CCW

Description	Status	Interactions
Collect_information	U	When parameter CollectedDigits contains the CCW feature access code, the SSP sends the call to FNAL treatment.
Offer_Call	S	When CCW is detected after the receipt of the Offer_Call response, the CCW feature assigned to the terminating DN/CT will not be encountered.Therefore the call will not be offered to the called party.

23.6.7 Dial Call waiting

The dial call waiting (CWD) feature allows the calling party to impose call waiting on a busy called station. To impose call waiting, the calling party must dial a feature activation code and then the extension number of the called party.

CWD has the same interactions as CWO. See CWO.

23.6.8 Talking call waiting

Talking call waiting (TCW) is an enhancement to the existing CWT feature. TCW is a separate line option that must be assigned in conjunction with the CWT line option. The TCW feature replaces the tone of the first CWT alerting

with an announcement from an offboard platform (service node). Typically, the announcement is composed of the CWT alerting tone immediately followed by an audible announcement of the calling party's name.

Note: All AIN triggers, events and responses are supported on the original incoming call to the TCW controller. See Section 23.6.1 “Call waiting” on page 857. The following sections detail TCW and AIN interactions on the call to the service node.

23.6.8.1 Trigger interactions with TCW

Table 302 provides trigger interactions with TCW.

Table 302 Trigger interactions with TCW

Trigger	Status	Interactions
AFR	S	This trigger can be hit on the call to the service node.
CDP	S	
International	UU	This trigger is not supported on the call to the service node. The trigger is not hit, a TCW 600 information log report is generated, the TCWDNERR OM register increments, the call to the service node is blocked, and normal call waiting resumes.
N11	S	This trigger can be hit on the call to the service node.
O_CPB	S	This trigger is not hit on the call to the service node.
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	UU	This trigger is not supported on the call to the service node. The trigger is not hit, a TCW 600 information log report is generated, the TCWDNERR OM register increments, the call to the service node is blocked, and normal call waiting resumes.
PFC	S	This trigger is not hit on the call to the service node.
PRIB	NA	TCW is not supported on PRI agents.
SDS	S	This trigger can be hit on the call to the service node.
SFC	S	This trigger is not hit on the call to the service node.
SIT	NA	TCW is not supported on trunk agents.

Table 302 Trigger interactions with TCW (Continued)

Trigger	Status	Interactions
Specified_Carrier	S	This trigger can be hit on the call to the service node.
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	A call will encounter TRA trigger when the terminator is subscribed to CWT and TCW, and call can be waited. T_Busy will take precedence over TRA when the terminator is subscribed to CWT and TCW, and the terminator is busy, and call can be waited. TRA will be encountered on receiving a Continue/Offercall response after a T_Busy trigger when the terminator, subscribed to CWT and TCW, is busy and call can be offered.
TKTERM	N/A	

23.6.8.2 Event interactions with TCW

Table 303 provides event interactions with TCW.

Table 303 Event interactions with TCW

Event	Status	Interactions
Network_Busy	S	This event can be armed/detected on the call to the service node.
O_Answer	S	
O_Disconnect	PS	Same as CWT
O_Disconnect_Called	PS	Same as CWT
Timeout	PS	Same as CWT
O_CPB	PS	This event cannot be armed on a call to the service node. A Close message is sent to the SCP as soon as a request to arm this event is received.
O_NoA	PS	
T_Answer	S	This event can be armed/detected on the call to the service node.
T_Busy	S	
T_NoA	S	

23.6.8.3 Other interactions with TCW

Table 301 provides other interactions with TCW.

Table 304 Other interactions with TCW

Description	Status	Interactions
Analyze_Route	S	These responses are all supported on the call to the service node.
Continue	S	
Authorize_Termination	S	
Forward_Call	S	
Offer_Call	S	
Collect_Info	S	
Disconnect	UU	When one of these responses is received, the call to the service node is released. A TCW600 log report is generated, the TCWDNERR OM register increments, TCW terminates and reverts to regular CWT.
SendToResource	UU	
CancelResource	UU	
CallingPartyID	S	When parameter Callingpartyid is modified by an SCP response on the initial call, or the call to the service node, the DN returned from the SCP is the one used by TCW to obtain the name from the service node.
DisplayText	S	When AIN display text is returned on the call to the TCW controller, the display text information is not used by TCW to query the service node. When AIN display text is returned on the call to the service node, the name in parameter DisplayText is the one that is played to the TCW controller.
ControllingLegTreatment	S	When an AIN distinctive tone applies to a call, TCW uses the SN DN corresponding to AIN distinctive tone. When the SDN is not datafilled, the regular DN is used by default.
PassiveLegTreatment	S	
Create_Call	S	When Create_Call alerts the originator TCW can not activate on a subsequent incoming call. When Create_Call determines that the originator is busy, TCW can not activate.

Table 304 Other interactions with TCW (Continued)

Description	Status	Interactions
Billing	S	The parameters returned in the AIN response take precedence over existing billing values. In particular, the carrier and charge number in the billing record can vary from those specified in table SPINFO.
DPConverter	S	When the call is waited on the originating line and a Collect_Information message received from the SCP/Adjunct contains the DPConverter parameter set to TRUE, if the originating line flashes to accept the call, then the SSP will not perform DP-to-DTMF conversion for the second call leg. If the originator flashes again to re-connect to the original terminator, the SSP will restore the DP-to-DTMF conversion for this call leg.

23.7 CLASS features

This section describes interactions with custom local area signaling services (CLASS) features. See Table 180 “DMS-100 features” on page 720 for a complete list of CLASS features.

23.7.1 CLASS anonymous caller rejection

In general, anonymous caller rejection (ACRJ) uses the name and parameter PresentationRestriction, and the DN and parameter PresentationRestriction to determine the anonymity of a caller. Inter-switch calls over PTS trunks do not have the name and number information. In this case the name and DN are considered present and their parameter PresentationRestriction is allowed. On all other calls, both name, its parameter PresentationRestriction, and DN with its parameter PresentationRestriction are available.

Based on the information ACRJ receives, ACRJ logic decides to present or reject the call.

23.7.1.1 Trigger interactions with CLASS ACRJ

Table 305 provides trigger interactions with CLASS ACRJ.

Table 305 Trigger interactions with CLASS ACRJ

Trigger	Status	Interactions
AFR	S	Calls that hit these triggers work correctly with ACRJ
CDP	S	
International	S	
N11	S	

Table 305 Trigger interactions with CLASS ACRJ (Continued)

Trigger	Status	Interactions
O_CPB	S	For intraswitch and interswitch calls, ACRJ has precedence over trigger O_CPB. Trigger O_CPB can be hit after ACRJ.
O_NoA	S	For intraswitch and interswitch calls, ACRJ has precedence over trigger O_NoA. Trigger O_NoA can be hit after ACRJ.
OHD	S	Calls that hit these triggers work correctly with ACRJ
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	ACRJ feature activates before trigger T_Busy. Trigger T_Busy is not detected when the call is rejected by this feature.
T_NoA	S	ACRJ feature activates before trigger T_No_Answer. Trigger T_No_Answer is not detected when the call is rejected by this feature.
TAT	S	Trigger TAT has precedence over the ACRJ feature.
TRA	S	ACRJ takes precedence over trigger TRA.
TKTERM	N/A	

23.7.1.2 Event interactions with CLASS ACRJ

Table 306 provides event interactions with CLASS ACRJ.

Table 306 Event interactions with Trigger interactions with CLASS ACRJ

Event	Status	Interactions
Network_Busy	S	This event is closed with a ClosedCause of call terminated when ACRJ rejects the call.
O_Answer	S	

Table 306 Event interactions with Trigger interactions with CLASS ACRJ

Event	Status	Interactions
O_CPB	S	When a NEL feature is active on the call and the call is sent to a line where ACRJ rejects the call, the call encounters O_Called_Party_Busy EDP-R. When the call is allowed to proceed, terminating events can be encountered. The busy cause in the O_Called_Party_Busy message is Call Rejected.
O_NoA	S	ACRJ has precedence over the O_No_Answer event.
T_Answer	S	CLASS anonymous call rejection (ACRJ) has precedence over this event when the feature rejects the call.
T_Busy	S	
T_NoA	S	

23.7.1.3 Other interactions with CLASS ACRJ

Table 307 provides other interactions with CLASS ACRJ.

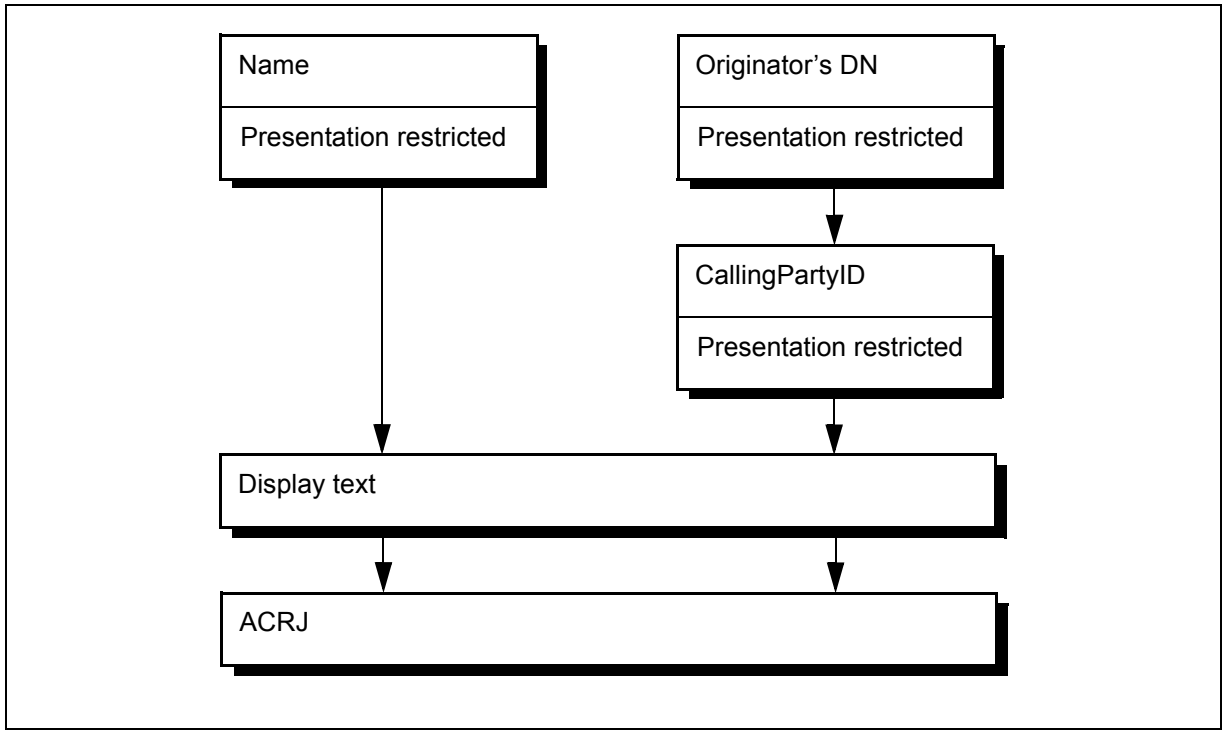
Table 307 Other interactions with CLASS ACRJ

Description	Status	Interactions
CallingPartyID	S	When the call encounters AIN, ACRJ uses the CallingPartyID in the SCP response as the originating DN. Assuming conformance to the protocol restrictions in GR-1298, when a CallingPartyID is received then the calling DN is considered present. The CallingPartyID's parameter, PresentationRestriction, is used by ACRJ to determine whether the presentation of the CallingPartyID is allowed. When a call encounters AIN, the CallingPartyID and the calling party presentation flag received in an AIN response is used to determine the calling number information. The calling name information can be updated depending on whether the CallingPartyID is the same as the originating DN. When the CallingPartyID is different from the originating DN, only the calling number is used to determine the anonymity of the call. In this case, the calling name is not used. When the calling party presentation is restricted in the AIN response, the call is considered anonymous and can be rejected by the ACRJ subscriber. For those cases where parameter CallingPartyID is received in a response message from the SCP database, parameter CallingPartyID replaces the original calling number for custom local area signaling service (CLASS) features.
Display Text	S	The display text parameter does not affect the ACRJ feature. Although the REASON field of the display text parameter can mark the call as Private or Unknown, this marking will not cause ACRJ to reject the call.
Offer_Call	NA	ACRJ has precedence over the T_Busy terminating event when the feature rejects the call. Therefore, there is no interaction with Offer_Call.
ExtendedRinging	S	Detection of O_NoA is based on the state of the line after the processing of ACRJ. When the state is ringing, O_NoA is encountered, the STR response message is processed, and ER is invoked (when applicable). The T_NoA trigger is not detected when the call is rejected by this feature.
Create_Call	S	When alerting the originator, terminating features do not activate. See "other inter with ACRJ - CallingPartyID

23.7.1.4 Miscellaneous information for ACRJ

Figure 120 demonstrates the flow of information into ACRJ.

Figure 120 Inputs to ACRJ logic



23.7.2 CLASS automatic callback

CLASS automatic callback (ACB) is an originating service that allows a user to "redial" the last call dialed. When the called station is busy, the user can queue against that station and be recalled when it becomes idle. ACB permits the subscriber to place a call to the last station called by the subscriber. It does not matter whether the last station called was busy or idle, answered or unanswered.

For an ACB activation to be allowed, both the trigger and the response, plus the content of the responses, encountered during the initial call must be allowed. ACB activation is dependent on the state of SOC option AIN00018.

Note 1: No triggers are hit during the ACB activation check and monitoring of the busy/idle status.

Note 2: Internodal ACB can yield inconsistent results. For example, when an Analyze_Route message was received in another node. This information is not transferred over TCAP, so the originating office does not know to block the call. In this scenario, it is likely that the wrong agent is checked for busy or idle status. When this agent becomes idle, the ACB originator attempts to call back the original destination, that can be busy or not.

23.7.2.1 Trigger interactions with CLASS ACB

Table 308 provides trigger interactions with CLASS ACB.

Table 308 Trigger interactions with CLASS ACB

Trigger	Status	Interactions
AFR	S	See tables that follow for a description of interactions.
CDP	S	
International	S	
N11	S	
O_CPB	S	In the case where trigger O_CPB is used as a means to offer in-call access to the ACB feature, the ESCFI ACBFAIL trigger escape criterion can be used to ensure that trigger O_CPB is only activated when the current call is eligible to ACB. When the ESCFI ACBFAIL escape criterion is datafilled in table TRIGITM, the SCP is queried only when the following criteria is satisfied: • ACB is accessible to the end user through a line option or customer group subscription • the DN in the OCM of the originating agent is valid • the originator receives a release cause other than User Busy. This assumes that the calls is intra-office or inter-office with full SS7 connectivity When the ESCFI ACBFAIL escape criterion is not datafilled in table TRIGITM, the OCPB trigger behaves independently of the eligibility to ACB on the subscriber's line. See tables that follow for a description of interactions.
O_NoA	S	In the case where trigger O_NoA is used as a means to offer in-call access to the ACB feature, the ESCFI ACBFAIL trigger escape criterion can be used to ensure that trigger O_NoA is only activated when the current call is eligible to ACB. When the ESCFI ACBFAIL escape criterion is datafilled in table TRIGITM, the SCP is queried only when the following criteria is satisfied: • ACB is accessible to the end user through a line option or customer group subscription • the DN in the OCM of the originating agent is valid When the ESCFI ACBFAIL escape criterion is not datafilled in table TRIGITM, the O_NoA trigger behaves independently of the eligibility to ACB on the subscriber's line.

Table 308 Trigger interactions with CLASS ACB (Continued)

Trigger	Status	Interactions
OHD	S	ACB calls use the originator's group translation, so trigger OHD is escaped when calls made with ACB are translated into an intercom call. See tables that follow for a description of interactions.
OHI	S	When the ACB subscriber is subscribed to OHI, then OHI takes precedence and ACB activation does not occur.
One_Plus_Prefix	S	See tables that follow for a description of interactions.
Operator_Services	S	
PFC	S	
PRIB	NA	ACB is not supported on PRI agents.
SDS	S	See tables that follow for a description of interactions.
SFC	S	
SIT	NA	ACB is not supported on trunk agents.
Specified_Carrier	S	See tables that follow for a description of interactions.
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	Trigger TRA will be encountered during the call back leg of the call when ACB is activated.
TKTERM	N/A	

23.7.2.2 Event interactions with CLASS ACB

Table 309 provides event interactions with CLASS ACB.

Table 309 Event interactions with CLASS ACB

Event	Status	Interactions
Network_Busy	S	See tables that follow for a description of interactions.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

23.7.2.3 Other interactions with CLASS ACB

Table 310 provides other interactions with CLASS ACB.

Table 310 Other interactions with CLASS ACB

Description	Status	Interactions
Offer_Call	S	ACB calls complete when the final terminator is busy or idle. When the terminator is busy, the call is queued and no triggers are hit. Therefore, there is no interaction with Offer_Call and ACB.
CallingPartyID	S	For those cases where parameter CallingPartyID is received in a response message from the SCP database, parameter CallingPartyID replaces the original calling number for custom local area signaling service (CLASS) features.
DisplayText	S	AIN DisplayText information is not provided to the ACB originator upon the ACB special ringback. AIN DisplayText information is delivered to the terminator during the ACB call.
Collect_Information	S	When the CollectedDigits parameter contains the ACB activation code, then the ACB feature is requested to activate on behalf of the triggering agent. The triggering agent must have previously been subscribed to the ACB feature.
Analyze_Route	S	See tables below for more information.

Table 310 Other interactions with CLASS ACB (Continued)

Description	Status	Interactions
Forward Call	PS	Although ACB activation will not be blocked after a Forward Call response, the agent that is being monitored for busy/idle status is the original triggering agent, and not the agent specified in the CalledPartyId parameter of the Forward Call response. For example when B is subscribed to a TAT trigger, and the response from the SCP is a Forward_Call to C, then B is monitored by ACB and not C. ACB activation (by the subscriber or the Collect_Information message) is blocked when the initial call was sent to treatment by the Disconnect or SendToResource response messages. See tables below for more information.
Disconnect	S	ACB activation (by the subscriber or the Collect_Information message) is blocked when the initial call was sent to treatment by the Disconnect or SendToResource response messages. See tables below for more information.
SendtoResource	S	
CalledPartyID	PS	For 950-XXXX calls, ACB cannot be invoked, no matter the value of the Nature of Number field in the CalledPartyID parameter in the response message. Attempts to invoke ACB on a call that resulted in a CalledPartyID with the nature of number field set to “950 + Call” in a response are sent to an announcement or, when the announcement is not available to No Service Circuits (NOSC) treatment. See tables below for more information.
Create_Call	S	Create_Call does not update the outgoing memory slot (OMS). When the call is established using the Create_Call message and the originator activates the ACB feature, the ACB feature applies to the last number dialed by the originator.

23.7.2.4 Miscellaneous information for CLASS ACB

Table 311 provides additional interactions for CLASS ACB.

Table 311 Trigger table - ACB interactions with AIN00018 SOC

Trigger	AIN00018 IDLE	AIN00018 ON
AFR	allowed/skipped	allowed/encountered
CDP (Note 2)	allowed/skipped	allowed/skipped (except CDPINT)
International	blocked	allowed/encountered

Table 311 Trigger table - ACB interactions with AIN00018 SOC (Continued)

Trigger	AIN00018 IDLE	AIN00018 ON
N11 (Note 1)	blocked	allowed/skipped
O_CPB	allowed/skipped	allowed/encountered
O_NoA	allowed/skipped	allowed/encountered
OHD	allowed/skipped	allowed/encountered
OHI	Not applicable	Not applicable
One_Plus_Prefix	blocked	allowed/encountered
Operator_services	blocked	allowed/encountered
PFC (Note 2)	allowed/skipped	allowed/skipped
PRIB	Not applicable	Not applicable
SDS	blocked	allowed/encountered
SFC (Note 2)	allowed/skipped	allowed/skipped
SIT	Not applicable	Not applicable
Specified_Carrier	blocked	allowed/encountered
T_Busy	allowed/encountered	allowed/encountered
T_NoA	allowed/encountered	allowed/encountered
TAT	allowed/encountered	allowed/encountered

Legend:

allowed--ACB activation is allowed when the corresponding trigger is hit on the initial call

skipped--an ACB originated call skips the corresponding trigger

blocked--ACB activation is blocked when the corresponding trigger is hit on the initial call

encountered--an ACB originated call hits the corresponding trigger

Note 1: The N11 trigger is not blocked by AIN software. It is blocked by the ACB feature software.

Note 2: The CDP (except CDPINT), SFC, or PFC triggers are not encountered during ACB calls because they require a vertical service code. When SFC trigger was encountered on the initial call, ACB activation will also depend on the subsequent digit collection pattern used by the SFC access code (for example, NORM).

Table 312 Response table - ACB interactions with AIN00018 SOC

Response	AIN00018 IDLE	AIN00018 ON
Analyze_Route diverting	blocked	blocked (except LNP calls)
Analyze_Route not diverting	blocked	Not applicable
Disconnect	blocked	blocked
Offer_Call	allowed	allowed
SendToResource conversation	allowed	allowed
SendToResource unidirectional	blocked	blocked
Forward_Call	allowed	allowed
Collect__Information	blocked	blocked
Other responses	allowed	allowed

Legend:

allowed--ACB activation is allowed when the corresponding response is received on the initial call

blocked--ACB activation is blocked when the corresponding response is received on the initial call

diverting--when the Analyze_Route response has a different called number, the call is diverted and marked as “diverting”

not diverting--when the Analyze_Route response has the same called number, the call is not diverted and is marked as “not diverting

Table 313 Event table - ACB interactions with AIN00018 SOC

Event	AIN00018 IDLE	AIN00018 ON
Network_Busy	allowed/not applicable	allowed/encountered
O_Answer	allowed/not applicable	allowed/encountered
O_CPB	allowed/not applicable	allowed/encountered
O_NoA	allowed/not applicable	allowed/encountered
T_Answer	allowed/encountered	allowed/encountered
T_Busy	allowed/encountered	allowed/encountered
T_NoA	allowed/encountered	allowed/encountered

Legend:

allowed--ACB activation is allowed when the corresponding trigger is hit on the initial call

encountered--an ACB originated call hits the corresponding trigger

not applicable--event cannot be armed on an ACB call, because no originating triggers can be hit on ACB call

23.7.3 CLASS automatic recall

CLASS automatic recall (AR) is an originating service that permits a user to recall the last station that called, and to be queued against that station when it is busy in the same manner as ACB. It does not matter whether the last call received by the subscriber was answered or unanswered. The subscriber completes the AR activation procedure and both the busy and idle status and class of service of the destination line are checked. When both stations are idle, the calling station is given special ringing and when the calling party answers, the call is set up and the called station is given regular ringing. Reverse translations are used to convert the CallingPartyID to a number dialable from the AR subscriber. Reverse translations are done using the netname PUBLIC.

The tables in this section are used together to determine AR originated call behavior, based on the triggers associated with a Calling Party DN or Called Party DN and responses plus the response content encountered on the initial call.

Note: No AIN triggers are hit during an AR activation check or during AR special ringing.

23.7.3.1 Trigger interactions with CLASS AR

Table 314 provides trigger interactions with CLASS AR.

Table 314 Trigger interactions with CLASS AR

Trigger	Status	Interactions
AFR	S	See tables below to learn how these triggers interact with AR.
CDP	S	
International	S	
N11	S	
O_CPB	S	The AR call completes only when the final terminator is idle.When the terminator is busy, the call is queued and no triggers are hit. In order to hit the O_CPB trigger on the AR leg, the AR line must change from IDLE to busy state during the placement of the AR call. When trigger O_CPB is hit during the initial call, the called party is able to activate AR, but is connected to the previous incoming caller, not the caller who encountered the O_CPB trigger. See tables below to understand how this trigger interacts with AR.
O_NoA	S	When the O_NoA trigger is hit or not, the O_NoA subscriber can still perform AR on the O_NoA call, even when the call was rerouted to another DN via AIN. See tables below for more information.

Table 314 Trigger interactions with CLASS AR (Continued)

Trigger	Status	Interactions
OHD	S	When a intercom call uses AR it escapes trigger Off-Hook_Delay. See tables below for more information.
OHI	S	OHI has precedence over AR activation. A subscriber with OHI, will not be able to activate AR.
One_Plus_Prefix	S	See tables below for more information.
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	The AR call completes only when the final terminator is idle.When the terminator is busy, the call is queued and no triggers are hit. In order to hit the T_Busy trigger on the AR leg, the AR'd line must change from IDLE to busy state during the placement of the AR call. When the T_Busy trigger is hit during the initial call, the T_Busy subscriber is able to activate AR, but is connected to the previous incoming caller, not the caller who encountered the T_Busy trigger. See tables below to understand how this trigger interacts with AR.
T_NoA	S	When the T_NoA trigger is hit or not, the T_NoA subscriber can still perform AR on the T_NoA call, even when the call was rerouted to another DN via AIN. See tables that follow for more information.
TAT	S	See tables that follow for more information.
TRA	S	A call can encounter trigger TRA during the recall leg.
TKTERM	N/A	

23.7.3.2 Event interactions with CLASS AR

Table 315 provides event interactions with CLASS AR.

Table 315 Event interactions with CLASS AR

Event	Status	Interactions
Network_Busy	S	See tables that follow for more information.
O_Answer	S	
O_CPB	S	The AR call completes only when the final terminator is idle.When the terminator is busy, the call is queued and no triggers are hit. In order to detect the O_CPB event on the AR leg, the AR'd line must change from IDLE to busy state during the placement of the AR call. When O_CPB event is detected during the initial call, the called party is able to activate AR, but is connected to the previous incoming caller, not the caller who encountered the O_CPB event.
O_NoA	S	O_NoA event is detected when terminator does not answer the AR call. When the O_NoA event is detected or not, the O_NoA agent can still perform AR on the O_NoA call, even when the call was rerouted to another DN via AIN.
T_Answer	S	See tables below to understand how this event interacts with AR.
T_Busy	S	The AR call completes only when the final terminator is idle.When the terminator is busy, the call is queued and no triggers are hit. In order to detect the T_Busy event on the AR leg, the AR'd line must change from IDLE to busy state during the placement of the AR call. When T_Busy event is detected during the initial call, the T_Busy subscriber is able to activate AR, but is connected to the previous incoming caller, not the caller who encountered the T_Busy event.
T_NoA	S	T_NoA event is detected when terminator does not answer the AR call. When the T_NoA event is detected or not, the T_NoA agent can still perform AR on the T_NoA call, even when the call was rerouted to another DN using AIN. See tables below to understand how this event interacts with AR.

23.7.3.3 Other interactions with CLASS AR

Table 316 provides other interactions with CLASS AR.

Table 316 Other interactions with CLASS AR

Description	Status	Interactions
Analyze _Route Response	S	AR activation is allowed when the initial call was routed to the AR subscriber through these responses.
Authorize termination Response	S	
Offer Call Response	S	When A and B are talking and C calls B, trigger T_Busy with an Offer_Call response is hit. After B completes call with A and C, it activates AR to recall last number. The last number is the DN that receives the Offer_Call. In this case it is C. The calling partyid can be 10 or 7 digits in the Offer_Call response. In both cases, the AR is allowed. AR requires the calling partyid in the response, but not the display text.
Forward Call Response	S	AR activation is allowed when the initial call was routed to the AR subscriber via the Forward Call response.
Other responses	S	Allowed (as long as the initial call was able to ring the AR subscriber).
CallingPartyID parameter	PS	The CallingPartyId received in the response must be equal to 10 digits or AR activation is blocked. When the AR feature is activated and the callingpartyid is received in an SCP response, it is the DN to recall.
CalledPartyID parameter	S	When a CalledPartyId parameter is returned in a response during the AR call, then the AR call terminates on the DN received in the response rather than the DN being monitored for idle.
DisplayText parameter	S	The Displaytext parameter is NOT used to determine the DN to perform AR upon.
Collect_Information	S	AR activation is allowed when the initial call was routed to the AR subscriber via the Collect Info response. When the CollectedDigits parameter contains the Automatic Recall feature activation code then the AR feature is requested to activate on behalf of the triggering agent. The triggering agent must be subscribed to the Automatic Recall feature.
Note: For 950-XXXX calls, AR cannot be invoked in the response message (regardless of the nature of number field value in parameter CalledPartyID).		

23.7.3.4 Miscellaneous

Table 317 provides AR interactions between AIN triggers and SOC AIN00018. The state of SOC option AIN00018 (in addition to other documented factors) is used to determine the behavior of AR originated calls.

Table 317 AR interactions with AIN triggers and SOC AIN000018

AIN TRIGGER	AIN00018 IDLE	AIN00018 ON
AFR	allowed/skipped	allowed/encountered
CDP	allowed/skipped	allowed/encountered
International	blocked	allowed/encountered
N11 (Note 1)	blocked	allowed/encountered
O_CPB (Note 2)	allowed/skipped	allowed/encountered
O_NoA	allowed/skipped	allowed/encountered
OHD	allowed/skipped	allowed/encountered
OHI	allowed/encountered	allowe/encountered
One_Plus_Prefix	blocked	allowed/encountered
Operator_services	blocked	allowed/encountered
PFC	allowed/NA	allowed/NA
PRIB	allowed/NA	allowed/NA
SDS	blocked	allowed/encountered
SFC	allowed/NA	allowed/NA

Legend:

allowed--origination of an AR call is allowed when the corresponding trigger was hit on the initial call

skipped--an AR originated call skips the corresponding trigger and in some cases this occurs because the trigger is not applicable to agents that AR can be provisioned on

blocked--origination of an AR call is blocked when the corresponding trigger was hi on the initial call

encountered--an AR originated call encounters the corresponding trigger

NA--not applicable

Note 1: The N11 trigger is not blocked by AIN software. It is blocked by the AR feature software.

Note 2: AR cannot be activated after O_CPB or T_Busy triggers when the call did not actually get to the ringing stage (for example, AR activation is disallowed for T_Busy/Continue trigger/response pair; AR activation is allowed for T_busy/Forward Call to DN X trigger/response pair, from DN X when DN X is not busy.)

Table 317 AR interactions with AIN triggers and SOC AIN000018 (Continued)

AIN TRIGGER	AIN00018 IDLE	AIN00018 ON
SIT	allowed/NA	allowed/NA
Specified_Carrier	blocked	allowed/encountered
T_BUSY (Note 2)	allowed/encountered	allowed/encountered
T_NoA	allowed/encountered	allowed/encountered
TAT	allowed/encountered	allowed/encountered
TKTERM	allowed/NA	allowed/NA

Legend:

allowed--origination of an AR call is allowed when the corresponding trigger was hit on the initial call

skipped--an AR originated call skips the corresponding trigger and in some cases this occurs because the trigger is not applicable to agents that AR can be provisioned on

blocked--origination of an AR call is blocked when the corresponding trigger was hi on the initial call

encountered--an AR originated call encounters the corresponding trigger

NA--not applicable

Note 1: The N11 trigger is not blocked by AIN software. It is blocked by the AR feature software.

Note 2: AR cannot be activated after O_CPB or T_Busy triggers when the call did not actually get to the ringing stage (for example, AR activation is disallowed for T_Busy/Continue trigger/response pair; AR activation is allowed for T_busy/Forward Call to DN X trigger/response pair, from DN X when DN X is not busy.)

Table 318 AR Interaction with AIN events and SOC AIN00018

EVENTS	AIN00018 IDLE	AIN00018 ON
Network_Busy	allowed/na	allowed/encountered
O_Answer	allowed/na	allowed/encountered
O_CPB (see Note)	allowed/na	allowed/encountered
O_NoA	allowed/na	allowed/encountered
T_Answer	allowed/encountered	allowed/encountered
T_Busy (see Note)	allowed/encountered	allowed/encountered
T_NoA	allowed/encountered	allowed/encountered

Legend:

allowed--origination of an AR call is allowed when the corresponding event was received on the initial call

skipped--an AR originated call skips the corresponding event

NA--OCM trigger are not encountered when SOC is IDLE so OCM events cannot be armed/detected

blocked--origination of an AR call is blocked when the corresponding event was detected on the initial call

encountered--an AR originated call can detect the corresponding event

Note: AR cannot be activated after O_CPB or T_Busy events when the call did not actually get to the ringing stage (e.g. AR activation is disallowed for T_Busy/Continue event/response pair; AR activation is allowed for T_busy/Forward Call to DN X event/response pair, from DN X when DN X is not busy.)

23.7.4 CLASS automatic recall limited to one

This feature resulted from regional regulations aimed at protecting subscribers from phone harassment related to AR. Operating companies can activate automatic recall limited to one (AROO) to limit to one the number of times AR can be against received phone calls.

23.7.4.1 Trigger interactions with CLASS automatic recall limited to one

AROO interacts with AIN in the same manner as automatic recall (AR). See Section 23.7.3.1 “Trigger interactions with CLASS AR” on page 887.

23.7.4.2 Event interactions with CLASS automatic recall limited to one

AROO interacts with AIN in the same manner as automatic recall (AR). See Section 23.7.3.2 “Event interactions with CLASS AR” on page 889.

23.7.4.3 Other interactions with CLASS automatic recall limited to one

AROO interacts with AIN in the same manner as automatic recall (AR). See Section 23.7.3.3 “Other interactions with CLASS AR” on page 890.

23.7.5 CLASS auto recall blocking of private calls

The CLASS auto recall blocking of private calls (CABOP) feature gives the functionality to prevent the disclosure of a “private” directory number (DN) upon an automatic recall (AR) activation attempt. A private call is considered to be a call originated from a station that disallows the disclosure of the calling number to a connected party. All AR activated calls that could generate a record of the private number on the AR subscriber’s AMA billing record are blocked and sent to treatment.

Note: All AR interactions in AR section still apply to CABOP.

23.7.5.1 Trigger interactions with CABOP

Table 319 provides trigger interactions with CABOP.

Table 319 Trigger interactions with CABOP

Trigger	Status	Interactions
AFR	S	CABOP functions correctly after hitting these triggers.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	A call encountering trigger TRA can encounter CABOP when receiving a Continue response from the SCP. CABOP functions correctly after hitting trigger TRA.
TKTERM	N/A	

23.7.5.2 Event interactions with CABOP

Table 320 provides event interactions with CABOP.

Table 320 Event interactions with CABOP

Event	Status	Interactions
Network_Busy	S	CABOP functions properly after detecting this event.
O_Answer		
O_CPB		
O_NoA		
T_Answer		
T_Busy		
T_NoA		

23.7.5.3 Other interactions with CABOP

Table 321 provides other interactions with CABOP.

Table 321 Other interactions with CABOP

Description	Status	Interactions
CallingPartyID	S	When CallingPartyID is present, CABOP will use the presentation status in the CallingPartyID parameter instead of the originator's presentation status.
DisplayText	S	CABOP does not use the information in parameter DisplayText.

23.7.6 CLASS bulk calling line identification

CLASS bulk calling line identification (BCLID) allows the operating company to deliver key information about incoming calls to the premises of individuals or groups of subscribers for immediate use, or for storage and later analysis. Available information includes the date and time the call was received, the calling and called directory numbers (DN), the busy or idle status of the called line, the calling line type, and a call forward indicator. The information is sent to the subscriber's printer, computer, or other subscriber premises equipment on a bulk calling line identification (BCLID) data link that uses CLASS modem resource (CMR) technology

23.7.6.1 Trigger interactions with CLASS BCLID

Table 322 provides trigger interactions with CLASS BCLID.

Table 322 Trigger interactions with CLASS BCLID

Trigger	Status	Interactions
AFR	S	BCLID functions correctly after hitting these triggers.
CDP	S	
International	S	
N11	S	
O_CPB	UU	Not applicable.
O_NoA	UU	Not applicable
OHD	S	BCLID functions correctly after hitting these triggers.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	UU	Not applicable.
T_NoA	UU	Not applicable.
TAT	S	BCLID functions correctly after hitting this trigger.
TRA	UU	Not applicable
TKTERM	N/A	

23.7.6.2 Event interactions with CLASS BCLID

Table 323 provides event interactions with CLASS BCLID.

Table 323 Event interactions with CLASS BCLID

Event	Status	Interactions
Network_Busy	UU	Not applicable
O_Answer	UU	
O_CPB	UU	
O_NoA	UU	
T_Answer	UU	
T_Busy	UU	
T_NoA	UU	

23.7.6.3 Other interactions with CLASS BCLID

Table 324 provides other interactions with CLASS BCLID.

Table 324 Other interactions with CLASS BCLID

Description	Status	Interactions
CallingPartyID	PS	When the SCP database includes the CallingPartyID parameter in a message, and the call encounters the Bulk Calling Line Identification (BCLID) feature, the number provided by the SCP database is used, provided it is 10 digits in length. When the CallingPartyID is other than 10 digits in length, the CallingPartyID is treated as out of range by the BCLID feature.
DisplayText	S	AIN displaytext information is not delivered to the bulk calling line identification (BCLID) data link when a originator calls a line with the BCLID option assigned.

23.7.7 CLASS calling name and number blocking

The CLASS calling name and number blocking (CNNB) option allows the subscriber to block the delivery of their NAME and DN on a per-call basis by first dialing the Feature access code before dialing the DN.

The CNNB access code for this feature is processed in the Analyzing Information PIC of the originating basic call model. Call processing then

returns to the CollectingInformation PIC with the additional dialed digits and without the feature access code, in order to initiate a call.

CAUTION
Possible feature override
CallingPartyID overrides CNNB even when CNNB is activated after CallingPartyID is received.

23.7.7.1 Trigger interactions with CLASS CNNB

Table 325 provides trigger interactions with CLASS CNNB.

Table 325 Trigger interactions with CLASS CNNB

Trigger	Status	Interactions
AFR	S	These triggers can be hit when CNNB is active.
CDP	S	
International	S	
N11	S	
O_CPB	S	For intraswitch and interswitch calls, these triggers do not have any impact on the delivery of display information on the originating and terminating agents.
O_NoA	S	
OHD	S	The CNNB feature access code is treated like any other switch-based feature access code. Calls with switch-based feature access codes escape from the information collected TDP. When the feature initiates a call, call processing moves to the collecting information PIC with the additional dialed digits and without the vertical service code digits. Calls of this nature can encounter trigger OHD.
OHI	S	OHI takes precedence over CNNB. CNNB is not encountered after OHI.
One_Plus_Prefix	S	These triggers can be hit when CNNB is active.
Operator_Services	S	
PFC	S	
PRIB	S	CNNB is not supported on PRI agents.
SDS	S	These triggers can be hit when CNNB is active.
SFC	S	

Table 325 Trigger interactions with CLASS CNNB (Continued)

Trigger	Status	Interactions
SIT	S	CNND is not supported on trunk agents.
Specified_Carrier	S	These triggers can be hit when CNNB is active.
T_Busy	S	
T_NoA	S	For intraswitch and interswitch calls, this trigger does not have any impact on the delivery of display information on the originating and terminating agents.
TAT	S	This trigger can be hit when CNNB is active.
TRA	S	CNNB is unaffected a call encounters trigger TRA.
TKTERM	N/A	

23.7.7.2 Event interactions with CLASS CNNB

Table 326 provides event interactions with CLASS CNNB.

Table 326 Event interactions with CLASS CNNB

Event	Status	Interactions
Network_Busy	S	This event can be armed or detected when CNNB is active.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

23.7.7.3 Other interactions with CLASS CNNB

Table 327 provides other interactions with CLASS CNNB.

Table 327 Other interactions with CLASS CNNB

Other	Status	Interactions
CallingPartyID	S	Dialing a feature access code to activate Calling Name Number Blocking (CNNB) affects the encoding of the CallingPartyID Presentation-Restriction indicator in the AIN query message. It is one of several factors used to determine whether to encode the field as “presentation restricted” or “presentation allowed”. For AIN responses, the value of the presentation restriction indicator received in the CallingPartyID parameter is used to determine whether to display the CallingLineID on residential CLASS sets only. AIN CallingPartyID presentation status always overrides switch based display features regardless of whether or not the switch based feature is activated before or after the AIN CallingPartyID is received. This is true even for the case when the Collect_Information message activates the calling name and number delivery blocking features and an AIN CallingPartyID parameter was received in the Collect_Information message. For example, when a CallingPartyID with presentation status of allowed is received with Analyze_Route and the Collect_Information message that activates Calling Number Delivery Blocking is received in response to a trigger after the Analyze_Route, the number specified in the CallingPartyID is displayed to the terminator
Collect_Information	S	AIN CallingPartyID presentation status always overrides switch-based display features regardless of whether or not the switch-based feature was activated before or after the AIN CallingPartyID is received. This still holds true regardless when the switch-based display feature was activated by the subscriber or via the Collect_Information message.
DisplayText	S	When the AIN DisplayText parameter is received at the SSP, the information is delivered to the terminating party irrespective of the blocking or unblocking features activated.

23.7.8 CLASS calling name and number display

CLASS calling name and number display (CNND) is a feature activated by the user that indicates that the user’s name and directory number can be displayed at the terminating set.

The CNND feature acts like a toggle for the presentation indicator.

23.7.8.1 Trigger interactions with CLASS CNND

Table 328 provides trigger interactions with CLASS CNND.

Table 328 Trigger interactions with CNND

Trigger	Status	Interactions
AFR	S	A call can hit these triggers when CNND is active.
CDP	S	
International	S	
N11	S	
O_CPB	S	For intraswitch and interswitch calls, these triggers do not have any impact on the delivery of display information on the originating and terminating agents.
O_NoA	S	
OHD	S	The CNND feature access code is treated like any other switch-based feature access code. Calls with feature access codes escape from the InformationCollected TDP. When the feature initiates a call, call processing moves to the collecting information pic with the additional dialed digits, and without the access code digits. Calls of this nature can encounter the OHD trigger.
OHI	S	OHI takes precedence over CNND. CNND is not encountered after OHI.
One_Plus_Prefix	S	These triggers can be hit when CNND is active.
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	N/A	CNND is not supported on trunk agents.
Specified_Carrier	S	These triggers can be hit when CNND is active.
T_Busy	S	
T_NoA	S	For intraswitch and interswitch calls, this trigger does not have any impact on the delivery of display information on the originating and terminating agents.
TAT	S	This trigger can be hit when CNND is active.

Table 328 Trigger interactions with CNND (Continued)

Trigger	Status	Interactions
TRA	S	CNND is unaffected when a call encounters trigger TRA.
TKTERM	N/A	

23.7.8.2 Event interactions with CLASS CNND

Table 329 provides event interactions with CLASS CNND.

Table 329 Event interactions with CLASS CNND

Event	Status	Interactions
Network_Busy	S	This event can be armed and detected when CNND is active.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

23.7.8.3 Other interactions with CLASS CNND

Table 330 provides other interactions with CLASS CNND.

Table 330 Other interactions with CLASS CNND

Other	Status	Interactions
CallingPartyID	S	Dialing a feature access code to activate Calling Name Number Display (CNND) affects the encoding of the CallingPartyID Presentation-Restriction indicator in the AIN query message. It is one of several factors used to determine whether to encode the field as “presentation restricted” or “presentation allowed”. For responses, the value of the presentation restriction indicator received in the CallingPartyID parameter is used to determine whether to display the CallingLineID on residential CLASS sets only.
DisplayText	S	When the AIN DisplayText parameter is received at the SSP, the information is delivered to the terminating party irrespective of the blocking or unblocking features activated.

23.7.9 CLASS calling name delivery - TR1188 TCAPNM

With TR-1188 calling name delivery (CNAMD), a user's name and related information are stored in a Residential centralized data base for display purposes at a terminating CLASS set.

For details regarding proprietary name display, see Section 23.7.10 “CLASS calling name delivery - nodal - RES” on page 906.

23.7.9.1 Trigger interactions with CNAMD

Table 331 provides trigger interactions with CNAMD.

Table 331 Trigger interactions with CNAMD

Trigger	Status	Interactions
AFR	S	A call that hits these triggers can encounter CNAMD
CDP	S	
International	S	
N11	S	
O_CPB	S	For intraswitch and interswitch calls, this trigger does not have any impact on the delivery of display information on the originating and terminating agents.
O_NoA	S	
OHD	S	A call that hits these triggers can encounter CNAMD
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	When a call routes to a line subscribing to a CNAMD, feature, the call encounters the T_Busy trigger when applicable.The T_Busy trigger does not have any impact on the delivery of display information on the terminating agents.

Table 331 Trigger interactions with CNAMD (Continued)

Trigger	Status	Interactions
T_NoA	S	When a call routes to a line subscribing to a CNAMD, feature, the call encounters the T_No_Answer trigger when applicable.The T_No_Answer trigger does not have any impact on the delivery of display information on the terminating agents.
TAT	S	A call that hits these triggers can encounter CNAMD.
TRA	S	CNAMD is unaffected when a call encounters trigger TRA.
TKTERM	N/A	

23.7.9.2 Event interactions with CNAMD

Table 332 provides event interactions with CNAMD.

Table 332 Event interactions with CNAMD

Event	Status	Interactions
Network_Busy	S	This event can be armed or detected on a call with CNAMD.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

23.7.9.3 Other interactions with CNAMD

Table 333 provides other interactions with CNAMD.

Table 333 Other interactions with CNAMD

Description	Status	Interactions
CallingPartyID	S	Parameter CallingPartyID in the AIN response is used to retrieve the calling party name and related information from the database.
DisplayText	S	AIN DisplayText takes precedence over the TCAPNM feature. The TCAPNM query is prevented when the AIN DisplayText information is received on a terminating agent subscribed to both TCAPNM and AIN DisplayText.

23.7.10 CLASS calling name delivery - nodal - RES

The CLASS calling name delivery (CNAMD) feature is a terminating RES CPE display call service that allows the called party subscribed to CNAMD to receive the calling party name, date and time during the first silent interval in the ringing cycle.

23.7.10.1 Trigger interactions with CNAMD

Table 334 provides trigger interactions with CNAMD.

Table 334 Trigger interactions with CNAMD

Trigger	Status	Interactions
AFR	S	A call that hits these triggers can encounter CNAMD.
CDP	S	
International	S	
N11	S	
O_CPB	S	For intraswitch and interswitch calls, this trigger does not have any impact on the delivery of display information on the originating and terminating agents.
O_NoA	S	
OHD	S	A call that hits these triggers can encounter CNAMD.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	When a call routes to a line subscribing to a CNAMD, feature, the call encounters the T_Busy trigger when applicable.The T_Busy trigger does not have any impact on the delivery of display information on the terminating agents.

Table 334 Trigger interactions with CNAMD

Trigger	Status	Interactions
T_NoA	S	When a call routes to a line subscribing to a CNAMD, feature, the call encounters the T_No_Answer trigger when applicable.The T_No_Answer trigger does not have any impact on the delivery of display information on the terminating agents.
TAT	S	A call that hits this trigger can encounter CNAMD.
TRA	S	CNAMD-RES is unaffected when a call encounters trigger TRA.
TKTERM	N/A	

23.7.10.2 Event interactions with CNAMD

Table 335 provides event interactions with CNAMD.

Table 335 Event interactions with CNAMD

Event	Status	Interactions
Network_Busy	S	This event can be armed or detected on a call with CNAMD.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

23.7.10.3 Other interactions with CNAMD

Table 336 provides other interactions with CNAMD.

Table 336 Other interactions with CNAMD

Description	Status	Interactions
CallingPartyID	S	For those cases where parameter CallingPartyID is received in a response message from the SCP database, parameter CallingPartyID replaces the original calling number for custom local area signaling service (CLASS) features.
DisplayText	S	DisplayText name information takes precedence over proprietary name information. The name information provided by DisplayText is used when provided. When DisplayText information is not provided, then proprietary name display is unaffected and can be used to complement other display information provided by DisplayText.

23.7.10.4 Miscellaneous information for CNAMD

Miscellaneous information for CNAMD follows.

Table 337 provides a summary of the functionality of CNAMD.

Table 337 CallingPartyID interaction with proprietary CNAMD

CallingPartyID parameter	Name display with NA005 functionality
Present and same as originating calling party DN	Calling name is displayed when available
Present and different from originating calling party DN	Blocked
Not present	Calling name is displayed when available

Table 338 summarizes the name and number display interactions of proprietary CNAMD with AIN. These are subject to switch-based datafilled presentation restriction options.

Table 338 Proprietary CNAMD and AIN interactions

AIN CallingPartyID	Parm	Switch-based resultant presentation restriction (Note 1)	Number display (Note 2)	Name display (Note 3)	
DN	Presentation restriction indicator			Switch-based resultant presentation restricted	Switch-based resultant presentation allowed
Not present or invalid	NA	presentation allowed	Calling DN	Private name	Calling name, when available
Present and different from originating Calling Party DN	presentation allowed	presentation restricted	CallingParty ID DN	Unknown name	Unknown name
Present and different from originating Calling Party DN	presentation allowed	presentation allowed	CallingParty ID DN	Unknown name	Unknown name
Present and different from originating Calling Party DN	presentation restricted	presentation restricted	Unknown number	Unknown name	Unknown name
Present and different from originating Calling Party DN	presentation restricted	presentation allowed	Private number	Unknown name	Unknown name
Present and same as originating Calling Party DN	presentation restricted	presentation restricted	Unknown number	Private name	Calling name, when available
Present and same as originating Calling Party DN	presentation restricted	presentation allowed	Private number	Private name	Calling name, when available

Table 338 Proprietary CNAMD and AIN interactions (Continued)

AIN CallingPartyID	Parm	Switch-based resultant presentation restriction (Note 1)	Number display (Note 2)	Name display (Note 3)	
DN	**Presentation restriction indicator**			**Switch-based resultant presentation restricted**	**Switch-based resultant presentation allowed**
Present and same as originating Calling Party DN	presentation allowed	presentation restricted	Calling DN	Private name	Calling name, when available
Present and same as originating Calling Party DN	presentation allowed	presentation allowed	Calling DN	Private name	Calling name, when available

Table 338 Proprietary CNAMD and AIN interactions (Continued)

AIN CallingPartyID	Parm	Switch-based resultant presentation restriction (Note 1)	Number display (Note 2)	Name display (Note 3)	
DN	Presentation restriction indicator			Switch-based resultant presentation restricted	Switch-based resultant presentation allowed

Legend:

Upper case letters— information displayed on the CPE

Lower case letters— data

Note 1: Resultant switch-based presentation restriction for number display is calculated according to the following precedence, where the highest precedence is at the top of the list. The resultant value is determined using switch-based options only, that is, the CallingPartyID Presentation Restriction Indicator value returned in the SCP response is not used in the calculations. Although CNAMD addresses RES lines only, EBS precedence is included for clarity.

- For RES lines
  - — CallingPartyID Presentation Restriction field in the SCP response message
  - — per-call invoked switch-based options
  - — per-line assigned switch-based options, for example, CND
- For EBS sets:
  - — network restrictions
  - — customer or feature group restrictions
  - — CallingPartyID parameter presentation restriction field in the SCP response message
  - — per-call invoked switch-based options
  - — per-line assigned switch-based options (for example, CND)

Note 2: Number display is dependent upon the SCP CallingPartyID DN, CallingPartyID presentation restriction indicator fields in the CallingPartyID parameter, as well as the switch-based resultant presentation restriction (see note 1).

Note 3: Name display is only dependent upon CallingPartyID DN and switch-based resultant name restrictions in columns 5 and 6.

23.7.11 CLASS calling number blocking

The following sections describe interactions with CLASS calling number blocking (CNB).

CAUTION
Possible feature override
CallingPartyID overrides CNB even when CNB is activated after CallingPartyID is received.

23.7.11.1 Trigger interactions with CNB

Table 339 provides trigger interactions with CNB.

Table 339 Trigger interactions with CNB

Trigger	Status	Interactions
AFR	S	These triggers can be hit when CNB is active.
CDP	S	
International	S	
N11	S	
O_CPB	S	For intraswitch and interswitch calls, the this trigger does not have any impact on the delivery of display information on the originating and terminating agents.
O_NoA	S	
OHD	S	The CNB feature access code is treated like any other switch-based feature access code. Calls with feature access codes escape from the InformationCollected TDP. When the feature initiates a call, call processing move to the collecting information PIC with the additional dialed digits, and without the feature access code digits. Calls of this nature can encounter trigger OHD.
OHI	S	OHI takes precedence over CNB. CNB is not encountered after OHI.

Table 339 Trigger interactions with CNB (Continued)

Trigger	Status	Interactions
One_Plus_Prefix	S	These triggers can be hit when CNB is active.
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	Trigger T_Busy does not have any impact on the delivery of display information on the terminating agents
T_NoA	S	Trigger T_No_Answer does not have any impact on the delivery of display information on the terminating agents
TAT	S	This trigger can be hit when CNB is active.
TRA	S	CNB is unaffected when a call encounters trigger TRA.
TKTERM	N/A	

23.7.11.2 Event interactions with CNB

Table 340 provides event interactions with CNB.

Table 340 Event interactions with CNB

Event	Status	Interactions
Network_Busy	S	This event can be armed or detected when CNB is active.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

23.7.11.3 Other interactions with CNB

Table 341 provides other interactions with CNB.

Table 341 Other interactions with CNB

Description	Status	Interactions
CallingPartyID	S	Dialing a feature access code to activate CNB affects the encoding of the CallingPartyID Presentation-Restriction indicator in the AIN query message. It is one of several factors used to determine whether to encode the field as “presentation restricted” or “presentation allowed”. For AIN responses, the value of the presentation restriction indicator received in the CallingPartyID parameter is used to determine whether to display the CallingLineID on residential CLASS sets only.
Offer_Call	S	Offer_Call supports CNB.
DisplayText	S	When the AIN DisplayText parameter is received at the SSP, the information is delivered to the terminating party irrespective of the blocking or unblocking features activated.

23.7.12 CLASS calling number delivery

CLASS calling number delivery (CND).

23.7.12.1 Trigger interactions with CND

Table 342 provides trigger interactions with CND.

Table 342 Trigger interactions with CND

Trigger	Status	Interactions
AFR	S	These triggers and CND can occur on the same call.
CDP	S	
International	S	
N11	S	
O_CPB	S	For intraswitch and interswitch calls, this trigger does not have any impact on the delivery of display information on the originating and terminating agents.
O_NoA	S	

Table 342 Trigger interactions with CND (Continued)

Trigger	Status	Interactions
OHD	S	These triggers and CND can occur on the same call.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	When a call routes to a line subscribing to a CND, feature, the call encounters the T_Busy trigger when applicable.The T_Busy trigger does not have any impact on the delivery of display information on the terminating agents.
T_NoA	S	When a call routes to a line subscribing to a CND, feature, the call encounters the T_No_Answer trigger when applicable.The T_No_Answer trigger does not have any impact on the delivery of display information on the terminating agents.
TAT	S	This trigger and CND can occur on the same call.
TRA	S	CND is unaffected when a call encounters trigger TRA.
TKTERM	N/A	

23.7.12.2 Event interactions with CND

Table 343 provides event interactions with CND.

Table 343 Event interactions with CND

Event	Status	Interactions
Network_Busy	S	This event can be armed or detected on a call with CND.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

23.7.12.3 Other interactions with CND

Table 344 provides other interactions with CND.

Table 344 Other interactions with CND

Description	Status	Interactions
CallingPartyID	PS	The CND feature can be used to display the calling number of an AIN call. When a CallingPartyID has been received from an SCP database, it is used to override the original calling number for display purposes. An exception to this occurs when the CallingPartyID parameter received is not 10 digits in length. It is not displayed using CLASS CND. The display is shown as unknown number in such a case.
DisplayText	S	When DisplayText provides the calling number information, the number information provided by CND is ignored and the number information provided by DisplayText is used.

23.7.13 CLASS calling number delivery blocking

The feature access code for the calling number deliver blocking (CNDB) feature is processed in the analyzing information PIC of the originating basic call model. Call processing then returns to the CollectingInformation PIC with

the additional dialed digits, and without the feature access code, in order to initiate a call.

CAUTION
Possible feature override
CallingPartyID overrides CNDB even when CNDB is activated after CallingPartyID is received.

23.7.13.1 Trigger interactions with CNDB

Table 345 provides trigger interactions with CNDB.

Table 345 Trigger interactions with CNDB

Trigger	Status	Interactions
AFR	S	These triggers can be hit when CNDB is active.
CDP	S	
International	S	
N11	S	
O_CPB	S	For intraswitch and interswitch calls this trigger does not have any impact on the delivery of display information on the originating and terminating agents.
O_NoA	S	
OHD	S	The CNDB feature access code is treated like any other switch-based feature access code. Calls with feature access codes escape from the InformationCollected TDP. When the feature initiates a call, call processing move to the collecting information pic with the additional dialed digits, and without the feature access code digits. Calls of this nature can encounter the OHD trigger.
OHI	S	OHI takes precedence over CNDB. CNDB will not be encountered after OHI.
One_Plus_Prefix	S	These triggers can be hit when CNDB is active.
Operator_Services	S	
PFC	S	
PRIB	NA	CNDB is not supported on PRI agents.

Table 345 Trigger interactions with CNDB (Continued)

Trigger	Status	Interactions
SDS	S	These triggers can be hit when CNDB is active.
SFC	S	
SIT	S	
Specified_Carrier	NA	CNDB is not supported on trunk agents.
T_Busy	S	The T_Busy trigger does not have any impact on the delivery of display information on the terminating agents
T_NoA	S	The T_No_Answer triggers does not have any impact on the delivery of display information on the terminating agents
TAT	S	These triggers can be hit when CNDB is active.
TRA	S	CNDB is unaffected when a call encounters trigger TRA.
TKTERM	N/A	

23.7.13.2 Event interactions with CNDB

Table 346 provides event interactions with CNDB.

Table 346 Event interactions with CNDB

Event	Status	Interactions
Network_Busy	S	This event can be armed or detected on calls with CNDB.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

23.7.13.3 Other interactions with CNDB

Table 347 provides other interactions with CNDB.

Table 347 Other interactions with CNDB

Other	Status	Interactions
CallingPartyID	S	Dialing a feature access code to activate CNDB affects the encoding of the CallingPartyID Presentation-Restriction indicator in the AIN query message. It is one of several factors used to determine whether to encode the field as “presentation restricted” or “presentation allowed”. For AIN responses, the value of the presentation restriction indicator received in the CallingPartyID parameter is used to determine whether to display the CallingLineID on residential CLASS sets only.This trigger and CND can occur on the same call.
DisplayText	S	When the AIN DisplayText parameter is received at the SSP, the information is delivered to the terminating party irrespective of the blocking or unblocking features activated.
Collect_Information	S	When parameter collected digits contains a calling name/number delivery blocking feature activation code, that feature is requested to activate on behalf of the triggering agent. The triggering agent must have previously been subscribed to the per-call calling name/number delivery blocking feature. AIN CallingPartyID presentation status always overrides switch-based display features regardless of whether or not the switch-based feature was activated before or after the AIN CallingPartyID is received. This still holds true regardless when the switch-based display feature was activated by the subscriber or via the Collect_Information message.

23.7.14 CLASS customer originated trace

CLASS customer originated trace (COT) enables a subscriber to activate a trace of the last incoming call. The call must be disconnected before COT is activated. The trace results in a report that is generated by the DMS log system and is available to the operating company, but not to the subscriber. The traced call includes the calling DN and DN suppression status. The trace also provides information on whether or not the call was out-of-area and the time the call was received. COT uses the ICM to retrieve information on the last incoming call.

23.7.14.1 Trigger interactions with COT

Table 348 provides trigger interactions with COT.

Table 348 Trigger interactions with COT

Trigger	Status	Interactions
AFR	S	When these triggers are hit, COT can be encountered. Calls placed from a line with COT can hit these triggers.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	OHI has precedence over COT activation. COT will not be activated after OHI.
One_Plus_Prefix	S	When these triggers are hit, COT can be encountered. Calls placed from a line with COT can hit these triggers.
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	COT is unaffected when the call encounters trigger TRA.
TKTERM	N/A	

23.7.14.2 Event interactions with COT

Table 349 provides event interactions with COT.

Table 349 Event interactions with COT

Event	Status	Interactions
Network_Busy	S	COT can be activated on calls that armed/detected these events
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

23.7.14.3 Other interactions with COT

Table 350 provides other interactions with COT.

Table 350 Other interactions with COT

Other	Status	Interactions
CallingPartyID	PS	When a CallingPartyID parameter is received in a response message from an SCP database, it is used in any Customer Originated Trace (COT) log that is generated. The contents of the COT log to be generated are taken from the incoming call memory block. For those cases where parameter CallingPartyID is received in a response message from the SCP database, parameter CallingPartyID replaces the original calling number for custom local area signaling service (CLASS) features. When the CallingPartyID received is not 10 digits in length, a LINE151 log is generated instead of a LINE150 log. When the CallingPartyID is less than 10 digits in length, the reason indicated in the LINE151 log is *Traced dn not 7 or 10 digits.* When the CallingPartyID is greater than 10 digits in length, the reason indicated in the LINE 151 log is *Calling party address not available.*
DisplayText	S	AIN DisplayText information is not displayed in the COT line 150 log.

23.7.15 CLASS dialable directory number

Dialable directory number (DDN) is an enhancement to the CND feature. DDN allows the calling number to be displayed in a format for the user to easily recall the caller.

23.7.15.1 Trigger interactions with DDN

Table 351 provides trigger interactions with DDN.

Table 351 Trigger interactions with DDN

Trigger	Status	Interactions
AFR	S	These triggers and DDN can occur on the same call.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	When a call routes to a line subscribing to a DDN, feature, the call encounters the T_Busy trigger when applicable.The T_Busy trigger does not have any impact on the delivery of display information on the terminating agents.
T_NoA	S	When a call routes to a line subscribing to a DDN, feature, the call encounters the T_No_Answer trigger when applicable.The T_No_Answer trigger does not have any impact on the delivery of display information on the terminating agents.

Table 351 Trigger interactions with DDN (Continued)

Trigger	Status	Interactions
TAT	S	This trigger and DDN can occur on the same call.
TRA	S	DDN is unaffected when the call encounters trigger TRA.
TKTERM	N/A	

23.7.15.2 Event interactions with DDN

Table 352 provides event interactions with DDN.

Table 352 Event interactions with DDN

Event	Status	Interactions
Network_Busy	S	This event can be armed or detected on calls with DDN.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

23.7.15.3 Other interactions with DDN

Table 353 provides other interactions with DDN.

Table 353 Other interactions with DDN

Other	Status	Interactions
CallingPartyID	S	When a CallingPartyID has been received from an SCP database, it is used as the basis for deriving the dialable directory number displayed. Table DNREVXLA is used to derive the dialable number.
DisplayText	S	The AIN DisplayText number is reverse translated according to table DNREVXLA. and the number is delivered in DDN format. When the translation of the DisplayText number fails, that number is delivered in calling number display (CND) format.

23.7.16 CLASS distinctive ringing and call waiting

CLASS distinctive ringing and call waiting (DRCW) is a call management feature that enables a subscriber to select a group of directory numbers where

incoming calls are identified at the called station by a distinctive ring or tone. Distinctive alerting is given when the subscriber receives a call from a directory number (DN) that is on the DRCW list. The screening list editing (SLE) feature can be used to update the DRCW list. When the subscriber makes a call to a DRCW subscriber¨s line and it is busy, the distinctive call waiting tone is given.

23.7.16.1 Trigger interactions with CLASS DRCW

Table 354 provides trigger interactions with CLASS DRCW.

Table 354 Trigger interactions with CLASS DRCW

Trigger	Status	Interactions
AFR	S	DRCW can be activated after hitting these triggers. Calls placed from a line with DRCW can hit these triggers.
CDP	S	
International	S	
N11	S	
O_CPB	S	DRCW takes precedence over trigger OCPB. Calls placed from a line with DRCW can hit trigger OCPB.
O_NoA	S	DRCW can be activated after hitting these triggers. Calls placed from a line with DRCW can hit these triggers.
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	Trigger T_Busy takes precedence over DRCW. DRCW can be encountered after a Continue or Offer_Call response for trigger T_Busy. Calls placed from lines with DRCW can hit trigger T_Busy.

Table 354 Trigger interactions with CLASS DRCW (Continued)

Trigger	Status	Interactions
T_NoA	S	DRCW can be activated after encountering these triggers. Calls placed from lines with DRCW can hit these triggers.
TAT	S	
TRA	S	DRCW is unaffected when the call encounters trigger TRA.
TKTERM	N/A	

23.7.16.2 Event interactions with CLASS DRCW

Table 355 provides event interactions with CLASS DRCW.

Table 355 Event interactions with CLASS DRCW

Event	Status	Interactions
Network_Busy	S	DRCW can be received after detecting a network busy event. Calls placed from lines with DRCW can arm/detect the Network_Busy event.
O_Answer	S	O_Answer event is detected after DRCW is encountered. Calls placed from lines with DRCW can arm/detect O_Answer event.
O_CPB	S	DRCW call waiting takes precedence over the OCPB event (for example, the event is not detected when DRCW is encountered). Calls placed from lines with DRCW can arm/detect the O_CPB event.
O_NoA	S	The O_NoA event is detected after DRCW has been encountered. Calls placed from lines with DRCW can arm/detect O_NoA event.
T_Answer	S	The T_Answer event is detected after DRCW has been encountered. Calls placed from lines with DRCW can arm/detect T_Answer event.
T_Busy	S	The T_Busy event takes precedence over DRCW. DRCW can be encountered after a Continue or Offer_Call response for T_Busy event.
T_NoA	S	The T_NoA event is detected after DRCW has been encountered. Calls placed from lines with DRCW can arm/detect T_NoA event.

23.7.16.3 Other interactions with CLASS DRCW

Table 356 provides other interactions with CLASS DRCW.

Table 356 Other interactions with CLASS DRCW

Other	Status	Interactions
DisplayText	S	When both DisplayText and DRCW are subscribed to by a user, DisplayText information can only be delivered when the silent interval of the distinctive ring pattern is equal to or greater than three seconds.
CallingPartyID	PS	The CallingPartyID received from the SCP is used to determine whether to apply DRCW. When the CallingPartyID is not a 10-digit number, DRCW does not apply. The calling number is treated as unavailable.
Forward Call	PS	A line assigned DRCW will get distinctive ringing based on the original calling number, irrespective of AIN redirection due to forward call.
ControllingLegTreatment	S	DRCW is applicable to AIN calls that do not activate AIN distinctive alerting or AIN distinctive call waiting. AIN ControllingLegTreatment and PassiveLegTreatment take precedence over DRCW. See Section 21.4.1 “AIN distinctive alerting” on page 730 and Section 21.4.2 “AIN distinctive alerting and call waiting” on page 732.
PassiveLegTreatment	S	
ExtendedRinging	S	ER functionality can be invoked when applicable. ER does not affect the distinctive alerting or tone being applied to the call.
Create_Call	S	When Create_Call alerts the originator, DRCW can not activate on a subsequent incoming call. When Create_Call determines that the originator is busy, DRCW can not activate.

23.7.17 CLASS long distance indicator

CLASS long distance indicator (LDI) indicates when an incoming call is long distance. LDI relies upon the “Long Distance Indicator” field of the incoming call memory block to determine when the call is long distance. The LDI is displayed on the set as the character L.

The LDI field of the incoming call memory block is determined using reverse translations from the called party to the CallingPartyID digits. When it is necessary to dial 1+7 digits or 1+10 digits to reach this CallingPartyID, then the call is marked as long distance.The incoming call memory block is updated when a CallingPartyID is received in a response message from the SCP.

23.7.17.1 Trigger interactions with CLASS LDI

Table 357 provides trigger interactions with CLASS LDI.

Table 357 Trigger interactions with CLASS LDI

Trigger	Status	Interactions
AFR	S	Call to and from lines with LDI can encounter these triggers and LDI functionality is not affected.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	Calls to and from lines with LDI will encounter trigger TRA; LDI functionality is not affected.
TKTERM	N/A	

23.7.17.2 Event interactions with CLASS LDI

Table 358 provides event interactions with CLASS LDI.

Table 358 Event interactions with CLASS LDI

Event	Status	Interactions
Network_Busy	S	Call to and from lines with LDI can arm/detect these events and LDI functionality is not affected.
O_Answer	S	
O_CPB	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

23.7.17.3 Other interactions with CLASS LDI

Table 359 provides other interactions with CLASS LDI.

Table 359 Other interactions with CLASS LDI

Other	Status	Interactions
CallingPartyID	S	When the CallingPartyID is sent in a response from the SCP, it is used to set the LDI status. For those cases where parameter CallingPartyID is received in a response message from the SCP database, parameter CallingPartyID replaces the original calling number for custom local area signaling service (CLASS) features.
DisplayText	S	When the DisplayText parameter is sent in a response from the SCP, evaluation of the LDI is not done based on the number provided by DisplayText.

23.7.18 CLASS message waiting indicator

CLASS message waiting indicator (CMWI) provides a means of controlling the MWI on a CLASS set. CMWI is invoked when a message waiting (MWT) subscriber with the CMWI options requires notification of the presence or absence of messages. Notification to the set does not take place unless the set is on-hook.

23.7.18.1 Trigger interactions with CMWI

Table 360 provides trigger interactions with CMWI.

Table 360 Trigger interactions with CMWI

Trigger	Status	Interactions
AFR	S	CMWI only occurs while the subscriber is on-hook, therefore, there are is no interactions with AIN triggers.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	UU	No applicable
TKTERM	N/A	

23.7.18.2 Event interactions with CMWI

Table 361 provides event interactions with CMWI.

Table 361 Event interactions with CMWI

Event	Status	Interactions
Network_Busy	S	CMWI only occurs while the subscriber is on-hook, therefore, there are no interactions with AIN events.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

23.7.18.3 Other interactions with CMWI

Table 362 provides other interactions with CMWI.

Table 362 Other interactions with CMWI

Description	Status	Interactions
CallingPartyID	S	For those cases where parameter CallingPartyID is received in a response message from the SCP database, parameter CallingPartyID replaces the original calling number for custom local area signaling service (CLASS) features.
Update message	See Section 1.9.8 “Station message waiting” on page 77.	

23.7.19 CLASS selective call acceptance

The selective call acceptance feature (SCA) allows a subscribe to selectively accept calls arriving from a limited set of previously identified directory numbers (DNs). The DNs to be accepted are built into a list via the screening list editing (SLE) facility. Calls that are not accepted (rejected) are given SCA treatment.

23.7.19.1 Trigger interactions with SCA

Table 363 provides trigger interactions with SCA.

Table 363 Trigger interactions with SCA

Trigger	Status	Interactions
AFR	S	A call that hits these triggers can encounter SCA.
CDP	S	
International	S	
N11	S	
O_CPB	S	For intraswitch and interswitch calls, SCA has precedence over O_CPB trigger. The O_CPB trigger can be hit after SCA.
O_NoA	S	For intraswitch and interswitch calls, SCA has precedence over O_NoA trigger. The O_NoA trigger can be hit after SCA.
OHD	S	A call that hits these triggers can encounter SCA.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	SCA has precedence over the T_Busy trigger. When the call is rejected by this feature, the T_Busy trigger is not encountered. When the call is accepted, the T_Busy trigger is encountered, when applicable.
T_NoA	S	SCA has precedence over the T_No-Answer trigger. When the call is rejected by this feature, the T_No-Answer trigger is not encountered. When the call is accepted, the T_No-Answer trigger is encountered, when applicable.
TAT	S	Trigger TAT takes precedence over SCA. When the SCP responds with an Authorize_Termination, SCA can activate.

Table 363 Trigger interactions with SCA (Continued)

Trigger	Status	Interactions
TRA	S	SCA takes precedence over trigger TRA. When the call is rejected by SCA, trigger TRA is not encountered. When the call is accepted, trigger TRA is encountered (when applicable).
TKTERM	N/A	

23.7.19.2 Event interactions with SCA

Table 364 provides event interactions with SCA.

Table 364 Event interactions with SCA

Event	Status	Interactions
Network_Busy	S	This trigger can be detected on call to a line with SCA.
O_Answer	S	When SCA accepts the call, this event is detected. When SCA rejects the call, this event is closed with a CloseCause of Call_Terminated.
O_CPB	S	When a call routes to a line where SCA rejects the call, the O_Called_Party_Busy EDP-R is encountered. When the call is allowed to proceed, terminating events can be encountered. The busy cause in the O_Called_Party_Busy message is CallRejected.
O_NoA	S	When SCA accepts the call, this event is detected.
T_Answer	S	Selective call acceptance (SCA) has precedence over the T_Answer event when the feature rejects the call.
T_Busy	S	Selective call acceptance (SCA) has precedence over the T_Busy event when the feature rejects the call. When SCA is active, then the T_Busy event is not encountered.
T_NoA	S	Selective call acceptance (SCA) has precedence over the T_No_Answer event when the feature rejects the call.

23.7.19.3 Other interactions with SCA

Table 365 provides other interactions with SCA.

Table 365 Other interactions with SCA

Other	Status	Interactions
CallingPartyID	PS	When an SCP database has supplied a CallingPartyID parameter, it is used in place of the original calling number within the selective call acceptance (SCA). When the CallingPartyID is not a ten digit number, it is not used for the purposes of SCA. The calling number from the response is disregarded and the SSP calling number is used for the SCA feature.
DisplayText	S	AIN DisplayText information is delivered to the terminator when SCA applies and the call is allowed to terminate.
ExtendedRinging	S	Detection of O_NoA is based on the state of the line after the processing of SCA. When the state is ringing, O_NoA is encountered, the STR response message is processed, and ER is invoked (when applicable). The T_NoA trigger is not detected when the call is rejected by this feature.
Create_Call	S	When alerting the originator, SCA is not activated.

23.7.20 CLASS selective call forwarding

Selective call forwarding (SCF) is an incoming call management feature that allows subscribers to define a special list of telephone numbers, called an SCF list, and a destination number. Calls that terminate on a line with this feature are forwarded only when the telephone number of the originating station matches one of the numbers in the SCF list.

23.7.20.1 Trigger interactions with SCF

Table 366 provides trigger interactions with SCF.

Table 366 Trigger interactions with SCF

Trigger	Status	Interactions
AFR	S	A call that hits these triggers can encounter SCF.
CDP	S	
International	S	
N11	S	

Table 366 Trigger interactions with SCF (Continued)

Trigger	Status	Interactions
O_CPB	PS	For intraswitch calls these triggers can only be hit at the originating party when a call forwarding feature is present at the terminating end.
O_NoA	PS	
OHD	S	A call that hits these triggers can encounter SCF.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	SCF has precedence over trigger T_Busy. T_Busy detection does not occur on the SCF subscriber when SCF forwards the call. When the call is not forwarded, it is similar to the normal call scenario and trigger T_Busy is encountered when applicable.
T_NoA	S	SCF has precedence over trigger T_No_Answer. T_No-answer detection does not occur on the SCF subscriber when SCF forwards the call. When the call is not forwarded, it is similar to the normal call scenario and trigger T_No_Answer is encountered when applicable.
TAT	S	Trigger TAT takes precedence over SFC. SFC can be encountered after TAT, when an Authorize_Termination response is received.
TRA	S	SCF takes precedence over trigger TRA. Trigger TRA detection does not occur on the SCF subscriber when SCF forwards the call. When the call is not forwarded, the call is similar to a normal call scenario and trigger TRA is encountered (when applicable).
TKTERM	N/A	

23.7.20.2 Event interactions with SCF

Table 367 provides event interactions with SCF.

Table 367 Event interactions with SCF

Event	Status	Interactions
Network_Busy	PS	For calls that involve an attendant console, when an event is active on a call and SCF feature forwards the call, any open NELS are closed and a Close message is sent to the SCP. Parameter CloseCause is set to “EDPs-completed” in the close message.
O_Answer	PS	
O_CPB	PS	
O_NoA	PS	
T_Answer	PS	Terminating events are encountered when the call is not forwarded by SCF. When an event is active on a call and SCF feature forwards the call, any open NELS are closed with a close message. Parameter CloseCause is set to “EDPs-completed” in the close message.
T_Busy	PS	
T_NoA	PS	

23.7.20.3 Other interactions with SCF

Table 368 provides other interactions with SCF.

Table 368 Other interactions with SCF

Other	Status	Interactions
CallingPartyID	PS	When an SCP database has supplied a CallingPartyID parameter, it is used in place of the original calling number within the selective call forwarding (SCF) feature. When the CallingPartyID is not a 10 digit number, it is not used for the purposes of SCF. The calling number is treated as being unavailable.
DisplayText	S	The interaction with AIN DisplayText is the same as for call forwarding, when SCF applies to the call, the AIN DisplayText information is not forwarded.
ExtendedRinging	S	ER can be applied to the forwarded DN, when applicable.
Create_Call	S	When alerting the originator, SCF is not activated.

23.7.21 CLASS selective call rejection

The selective call rejection (SCRJ) feature allows a subscriber to selectively reject calls arriving from a limited set of previously identified directory numbers (DNs). The DNs to be rejected are built into a list via the screening list editing (SLE) facility. Calls that are rejected are given treatment SCRJ.

23.7.21.1 Trigger interactions with SCRJ

Table 369 provides trigger interactions with SCRJ.

Table 369 Trigger interactions with SCRJ

Trigger	Status	Interactions
AFR	S	A call that hits these triggers can encounter SCRJ.
CDP	S	
International	S	
N11	S	
O_CPB	S	For intraswitch and interswitch calls, SCRJ has precedence over O_CPB trigger. The O-CPB trigger can be hit after SCRJ.
O_NoA	S	For intraswitch and interswitch calls, SCRJ has precedence over O_NoA trigger. The O_NoA trigger can be hit after SCRJ.
OHD	S	A call that hits these triggers can encounter SCRJ.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	SCRJ has precedence over the T_Busy trigger. When the call is rejected by this feature, the T_Busy trigger is not encountered. When the call is accepted, the T_Busy trigger is encountered, when applicable.
T_NoA	S	SCRJ has precedence over the T_No-Answer trigger. When the call is rejected by this feature, the T_No-Answer trigger is not encountered. When the call is accepted, the T_No-Answer trigger is encountered, when applicable.

Table 369 Trigger interactions with SCRJ (Continued)

Trigger	Status	Interactions
TAT	S	Trigger TAT has precedence over SCRJ. SCRJ can be encountered after trigger TAT, when an authorize_Termination response is received.
TRA	S	SCRJ takes precedence over trigger TRA. When the call is rejected by SCRJ, trigger TRA is not encountered. When the call is accepted, trigger TRA is encountered (when applicable).
TKTERM	N/A	

23.7.21.2 Event interactions with SCRJ

Table 370 provides event interactions with SCRJ.

Table 370 Event interactions with SCRJ

Event	Status	Interactions
Network_Busy	S	When the call is not rejected by SCRJ feature, this event can be encountered. When the call is rejected, the event is closed with a CloseCause of Call terminated.
O_Answer	S	
O_CPB	S	When a NEL is active on a call, and the call routes to a line where SCRJ rejects the call, the O_CPB event is encountered. When the call is allowed to proceed, terminating events can be encountered. The busy cause in the O_CPB message is CallRejected.
O_NoA	S	When the call is not rejected by SCRJ, this event can be detected.
T_Answer	S	When SCRJ is active, then this event is not encountered.
T_Busy	S	
T_NoA	S	

23.7.21.3 Other interactions with SCRJ

Table 371 provides other interactions with SCRJ.

Table 371 Other interactions with SCRJ

Other	Status	Interactions
CallingPartyID	PS	When an SCP database has supplied a CallingPartyID parameter, it is used in place of the original calling number within the Selective Call Rejection (SCRJ) feature. ***Note:*** When the CallingPartyID is not a 10 digit number, it is not used for the purposes of SCRJ. The calling number is treated as being unavailable.
DisplayText	S	For calls that are rejected, termination does not occur and therefore AIN DisplayText information is not delivered.
ExtendedRinging	S	Detection of O_NoA is based on the state of the line after the processing of SCRJ. When the state is ringing, O_NoA is encountered, the STR response message is processed, and ER is invoked (when applicable). The T_NoA trigger is not detected when the call is rejected by this feature.
Create_Call	S	When alerting the originator, SCRJ is not activated.

23.8 Class of service features

This section describes interactions with class of service features. AIN supports the following class of service features:

- automatic number identification (ANI)
- flexible automatic number identification (FANI)
- hotel or motel (HOT)
- restricted sent paid (RSP)

23.8.1 Automatic number identification

Automatic number identification (ANI) is Bellcore-defined information digits used to identify the type of originating line, special characteristics of the calling number, or certain service classes. ANI digits include the hotel or motel room identification digits and the restricted sent paid (RSP) digits.

23.8.1.1 Trigger interactions with ANI

Table 372 provides trigger interactions with ANI.

Table 372 Trigger interactions with ANI

Trigger	Status	Interactions
AFR	S	See Table 374 “Other interactions with ANI” on page 941.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	

Table 372 Trigger interactions with ANI

Trigger	Status	Interactions
TRA	S	ANI is used to populate the ChargePartyStationType or CalledPartyStationType. For a Forward_Call response from the SCP that routes the call over an Equal Access (EA) carrier, parameter ChargePartyStationType represents the ANI digits associated with the Charge Number. When parameter ChargePartyStationType and parameter ChargeNumber are received in the FC response, the ChargePartyStationType value overwrites the ANI information for the call. When parameter ChargePartyStationType and parameter ChargeNumber are not present in the FC response, the ANI information digits are retrieved from the triggering agent, and are outpulsed over the EA carrier.
TKTERM	N/A	

23.8.1.2 Event interactions with ANI

Table 373 provides event interactions with ANI.

Table 373 Event interactions with ANI

Event	Status	Interactions
Network_Busy	S	See Table 374 “Other interactions with ANI”.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

23.8.2 Other interactions with ANI

Table 374 provides other interactions with ANI.

Table 374 Other interactions with ANI

Description	Status	Interactions
ChargePartyStationType	S	ANI is used to populate the ChargePartyStationType or CalledPartyStationType. For an Analyze_Route or Forward_Call response from the SCP, that routes the call over an Equal Access (EA) carrier, the ChargePartyStationType parameter represents the ANI digits associated with the Charge Number. When a ChargePartyStationType parameter and the ChargeNumber parameter are received in an AIN response, then the ChargePartyStationType value overwrites the ANI information for the call. When these parameters are not present in the AIN response, then the ANI information digits are retrieved from the triggering agent, and are outpulsed over the EA carrier. The ANI II digit pair, “25”, identifies a toll-free call that has been translated to a POTS route number originating from a pay phone. The ANI II digit pair, “24”, identifies a toll-free call that has been translated to a POTS route number originating from a non-pay phone.
CalledPartyStationType	S	
ChargeNumber	S	

23.8.3 Flexible automatic number identification

Flexible automatic number identification (FANI) are special purpose ANI digits defined by the operating company to identify special types or characteristics of calls that have less widespread applications and are not covered by the general Bellcore definitions. FANI information digits apply to outgoing Equal Access (EA) and EA corridor.

Any two-digit pair ranging from 00 through 99 can be used as FANI information digits, even when the selected digit pair has already been defined by Bellcore as a standard two-digit ANI information digit code.

23.8.3.1 Trigger interactions with FANI

Table 375 provides trigger interactions with FANI.

Table 375 Trigger interactions with FANI

Trigger	Status	Interactions
AFR	S	See Table 377 “Other interactions with FANI” on page 944.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	

Table 375 Trigger interactions with FANI

Trigger	Status	Interactions
TRA	S	FANI representation is used to populate ChargePartyStationType or CalledPartyStationType when the FANI option is subscribed. When the FANI option is not subscribed, ANI is used to populate the ChargePartyStationType or CalledPartyStationType. For a Forward_Call response from the SCP that routes the call over an Equal Access (EA) carrier, parameter ChargePartyStationType represents the FANI digits associated with the ChargeNumber. When parameter ChargePartyStationType and parameter ChargeNumber are received in the FC response, the ChargePartyStationType value overwrites the FANI information for the call. When parameter ChargePartyStationType and parameter ChargeNumber are not present in the FC response, the FANI information digits are retrieved from the triggering agent, and are outpulsed over the EA carrier.
TKTERM	N/A	

23.8.3.2 Event interactions with FANI

Table 376 provides event interactions with FANI.

Table 376 Event interactions with FANI

Event	Status	Interactions
Network_Busy	S	See Table 377 “Other interactions with FANI”.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

23.8.4 Other interactions with FANI

Table 377 provides other interactions with FANI.

Table 377 Other interactions with FANI

Description	Status	Interactions
ChargePartyStationType	S	FANI representation is used to populate ChargePartyStationType or CalledPartyStationType when the FANI option is subscribed. When the FANI option is not subscribed, then ANI is used to populate the ChargePartyStationType or CalledPartyStationType. For an Analyze_Route or Forward_Call response from the SCP, that routes the call over an Equal Access (EA) carrier. The ChargePartyStationType parameter represents the FANI digits associated with the ChargeNumber. When a ChargePartyStationType parameter and the ChargeNumber parameter are received in an AIN response, then the ChargePartyStationType value overwrites the FANI information for the call. When these parameters are not present in the AIN response, then the FANI information digits are retrieved from the triggering agent, and are outpulsed over the EA carrier. The ANI II digit pair, “25”, identifies a toll-free call that has been translated to a POTS route number originating from a pay phone. The ANI II digit pair, “24”, identifies a toll-free call that has been translated to a POTS route number originating from a non-pay phone.
CalledPartyStationType	S	
ChargeNumber	S	

23.8.5 Hotel or motel

ANI digits include HOT room identification digits. Therefore, HOT has the same interactions with AIN as ANI.

23.8.6 Restricted sent paid

ANI digits include the restricted sent paid (RSP) digits. Therefore, RSP has the same interactions with AIN as ANI. See Section 23.8.1 on page 938.

23.9 Conference features

This section describes interactions with conference features. See Table 180 “DMS-100 features” on page 720 for a complete list of conference features.

23.9.1 Meet-me conference

Meet-me conference provides a six-port conference bridge and directory number that conference members dial at a specified time in order to hold a conference.

23.9.1.0.1 Trigger interactions with Meet-me conference

Table 378 provides trigger interactions with meet-me conference.

Table 378 Trigger interactions with Meet-me conference

Trigger	Status	Interactions
AFR	S	These triggers can be hit on a call to meet-Me conference.
CDP	S	
International	S	
N11	S	
O_CPB	S	OCPB trigger is hit when the maximum number of conferees have already dialled into the conference, and the OCPB subscriber tries to dial into the meet-me conference.
O_NoA	PS	For interswitch calls the O_NoA trigger is supported. O_NoA is not hit for intraswitch calls.
OHD	S	These triggers can be hit on a call to meet-Me conference.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	U	Meet-me conference directory number cannot subscribe to the AINDN option, therefore, it cannot subscribe to these triggers.
T_NoA	U	
TAT	U	

Table 378 Trigger interactions with Meet-me conference (Continued)

Trigger	Status	Interactions
TRA	PS	Meet-me conference/preset conference directory number cannot subscribe to the AINDN option and therefore, cannot subscribe to trigger TRA. During the conference leg of the preconf, trigger TRA is encountered.
TKTERM	N/A	

23.9.1.0.2 Event interactions with meet-me conference

Table 379 provides event interactions with meet-me conference.

Table 379 Event interactions with meet-me conference

Event	Status	Interactions
O_Disconnect	PS	These events are closed when the call routes to a meet-me conference. The CloseCause is set to EDPs_completed.
O_Disconnect_Called	PS	
Network_Busy	PS	
O_Answer	PS	
O_CPB	PS	
O_NoA	PS	
Timeout	PS	
T_Answer	U	Since terminating triggers cannot be hit, terminating events cannot be armed and detected.
T_Busy	U	
T_NoA	U	

23.9.1.1 Other interactions with meet-me conference

Table 380 provides other interactions with meet-me conference.

Table 380 Other interactions with meet-me conference

Description	Status	Interactions
Collect_Info	S	These SCP responses can route the call to a meet-me conference.
Analyze_Route	S	
Forward_Call	S	

Table 380 Other interactions with meet-me conference

Description	Status	Interactions
CallingPartyBGID	S	On the terminating switch, an incoming MBG call to the meet-me conference DN can initiate a meet-me conference. When the conference DN can only be initiated by intragroup members, then the MBG call must be a member of the meet-me conference customer group. Subsequent parties can join the conference by calling the meet-me conference DN. The meet-me conference can be setup to permit only parties in the customer group to join the conference. The customer group of the MBG call is specified in the BGID parameter and corresponds to the CallingPartyBGID parameter returned by the SCP.
Create_Call	S	A call can route to a MeetMe conference DN through a Create_Call request. When a CallingPartyID of a Create_Call message contains a MeetMe Conference DN, the Create_Call request is rejected by sending the SCP a failure message with failureCause=inappropriateUserInterface.
DPConverter	S	When the Collect_Information message received from the SCP/Adjunct contains the DPConverter parameter, the SSP will provide extended DP-to-DTMF conversion after the call has been placed into a conference. Both DP and DTMF tones will be audible to all other parties in the conference.

23.9.2 Preset conference

The following sections describe trigger, event, and other interactions with preset conference.

23.9.2.1 Trigger interactions with preset conference

Table 381 provides trigger interactions with preset conference.

Table 381 Trigger interactions with preset conference

Trigger	Status	Interactions
AFR	S	These triggers can be hit on a call to the preset conference.
CDP	S	
International	S	
N11	S	

Table 381 Trigger interactions with preset conference (Continued)

Trigger	Status	Interactions
O_CPB	PS	These triggers are not supported for intra switch calls. It is supported for inter-switch calls.
O_NoA	PS	
OHD	S	These triggers can be hit on a call to the preset conference.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	NS	These triggers cannot be assigned to the preset conference DN. These triggers cannot be hit on calls from the preset conference DN to the conferee.
T_NoA	NS	
TAT	NS	
TRA	PS	TRA trigger cannot be assigned to the preset conference DN. TRA trigger can be hit on the call from the preset conference DN to the conferee.
TKTERM	N/A	

23.9.2.1.1 Event interactions with preset conference

Table 382 provides event interactions with preset conference.

Table 382 Event interactions with preset conference

Event	Status	Interactions
O_Disconnect	PS	These events are closed as soon as the call is routed to a preset conference DN. The closeCause is set to EDPs_Completed.
O_Disconnect_Called	PS	
Network_Busy	PS	
O_Answer	PS	
O_CPB	PS	
O_NoA	PS	
Timeout	PS	
T_Answer	NS	Because terminating triggers are not supported, terminating events cannot be armed on a call to a preset conference DN. Terminating triggers cannot be detected on a call from the preset conference DN.
T_Busy	NS	
T_NoA	NS	

23.9.2.1.2 Other interactions with preset conference

Table 383 provides other interactions with preset conference.

Table 383 Other interactions with preset conference

Description	Status	Interactions
CallingPartyBGID	S	The preset conference feature can be setup such that the MBG call must be a member of the preset conference customer group and act as the controller. The controller can add on parties that are not in the same customer group. The customer group of the MBG call is specified in the BGID parameter and corresponds to the CallingPartyBGID parameter returned by the SCP.
Collect_information	S	All these SCP responses can route the call to a Preset conference DN.
Analyze_route	S	
Forward_Call	S	

Table 383 Other interactions with preset conference

Description	Status	Interactions
Create_Call	S	A call can route to a preset conference DN through a Create_Call request. When a CallingPartyID of a Create_Call message contains a preset Conference DN, the Create_Call request is rejected by sending the SCP a failure message with failureCause=inappropriateUserInterface.
DPConverter	S	When the Collect_Information message received from the SCP/Adjunct contains the DPConverter parameter, the SSP will provide extended DP-to-DTMF conversion after the call has been placed into a conference. Both DP and DTMF tones will be audible to all other parties in the conference.

23.9.3 Executive conference (MMCONF 150)

For the call setup (for example, dialing into the meet-me conference.) Executive conference has the same interactions as meet-me. This section describes how the controller adds new members to the existing conference.

23.9.3.1 Trigger interactions with MMCONF 150 (when adding conferees)

Table 384 provides trigger interactions with MMCONF 150 (when adding conferees).

Table 384 Trigger interactions with MMCONF 150

Trigger	Status	Interactions
AFR	S	When the controller dials a new call leg, these triggers can be hit.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	When the controller dials a new call leg, these triggers can be hit.
TKTERM	N/A	

23.9.3.1.1 Event interactions with MMCONF 150 (when adding conferees)

Table 385 provides event interactions with executive conference (MMCONF 150) when adding conferees.

Table 385 Event interactions with MMCONF 150 (when adding conferees)

Event	Status	Interactions
O_Disconnect	UU	Not Supported
O_Disconnect_Called	UU	
Timeout	UU	
Network_Busy	S	These events can be armed and detected when adding a conference.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

23.9.3.1.2 Other interactions with MMCONF 150 conference

Table 386 provides other interactions with MMCONF 150 conference.

Table 386 Other interactions with MMCONF 150 conference

Description	Status	Interactions
DPConverter	S	When the Collect_Information message received from the SCP/Adjunct contains the DPConverter parameter, the SSP will provide extended DP-to-DTMF conversion after the call has been placed into a conference. Both DP and DTMF tones will be audible to all other parties in the conference.

23.9.4 Station controlled conference (CNF, CNF6, CNF30)

A call cannot be added to a station controlled conference (CNF), six-port conference (CNF6), or super conferencing (CNF30) conference until the call is answered. This is a CNF functionality.

23.9.4.0.1 Trigger interactions with CNF, CNF6, CNF30

Table 387 provides trigger interactions with CNF, CNF6, CNF30.

Table 387 Trigger interactions with CNF, CNF6, CNF30

Trigger	Status	Interactions
AFR	S	These triggers can be hit on the second leg of a CNF.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	Trigger TRA is encountered during the conference leg of the call.
TKTERM	N/A	

23.9.4.0.2 Event interactions with CNF, CNF6, CNF30

Table 388 provides event interactions with CNF, CNF6, CNF30.

Table 388 Event interactions with CNF, CNF6, CNF30

Event	Status	Interactions
O_Disconnect	UU	Not Supported
O_Disconnect_Called	UU	
Timeout	UU	
Network_Busy	S	This event can be armed and detected on the second leg of a CNF.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

23.9.4.0.3 Other interactions with CNF, CNF6, CNF30

Table 389 provides other interactions with CNF, CNF6, CNF30.

Table 389 Other interactions with CNF, CNF6, CNF30

Description	Status	Interactions
DPConverter	S	When the Collect_Information message received from the SCP/Adjunct contains the DPConverter parameter, then the SSP will provide extended DP-to-DTMF conversion after the call has been placed into a conference. Both DP and DTMF tones will be audible to all other parties in the conference

23.10 Cut off on disconnect

The following section describes interactions with the cut off on disconnect (COD) feature.

23.10.1 Trigger interactions with COD

Table 390 provides trigger interactions with COD.

Table 390 Trigger interactions with COD

Trigger	Status	Interactions
AFR	S	AIN triggers do not affect the functionality of COD.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	No interaction because AIN does not affect the functionality of COD.
TKTERM	N/A	

23.10.2 Event interactions with COD

Table 391 provides event interactions with Event interactions with COD.

Table 391 Event interactions with Event interactions with COD

Event	Status	Interactions
Network_Busy	S	AIN events do not affect the functionality of cutoff on disconnect (COD).
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24 AIN/DMS-100 interactions (D to H)

WARNING
Limited information source
The status of each feature (documented in the interactions chapters) is provided as an indicator. Please read all information associated with each feature.

AIN interacts with many DMS-100 switch features. The purpose of this chapter is to document interactions between various AIN functionalities (for example, intra-AIN interactions). The feature interactions chapters are arranged alphabetically into five chapters. This chapter describes the interactions for features that begin with the letters D through H.

Note: See Chapter 21: "AIN interactions introduction" on page 717 to learn how to use this information.

24.1 Database services features

Database services include E800 and 500. For intraswitch and interswitch calls, AIN and E800 interworking features have been developed to support this interaction. Since this feature uses the AIN framework there is no modification.

24.1.1 E800

AIN and enhanced 800 (E800) call processing can occur on a call in a single office or in multiple offices.

24.1.1.1 Trigger interactions with E800

Table 392 provides trigger interactions with E800.

Table 392 Trigger interactions with E800

Trigger	Status	Interactions
AFR	PS	AIN response message can route the call to an E800 number. It is not possible to encounter the Automatic Flexible Routing trigger after E800 processing takes place. This is true even after call forwarding takes place.
CDP	S	AIN response message can route the call to an E800 number. The CDPCODE trigger versus E800 feature precedence is decided by the AIN_800CDP_PRECEDENCE office parameter value in the table OFCVAR and the customer group option AINPRECE in the table CUSTSTN against that customer group. For example, if a subscriber form a centrex group dials 9+800+XXX+XXXX, where 9 is the CDP trigger then the precedence between the E800 feature and the CDP trigger is decided by the above mentioned options. ***Note:*** See Chapter “Other interactions” to learn how to datafill the office wide and the customer group precedence options.
International	S	AIN response message can route the call to an E800 number. E800 response can encounter the INTL prefix trigger.
N11	S	AIN response message can route the call to an E800 number. E800 response cannot directly encounter the N11 trigger.
O_CPB	S	AIN response message can route the call to an E800 number. E800 response can encounter the OCBP trigger.
O_NoA	S	AIN response message can route the call to an E800 number. E800 response can encounter the ONOA trigger.
OHD	S	AIN response message can route the call to an E800 number. E800 response cannot directly encounter the OHD trigger.
OHI	S	AIN response message can route the call to an E800 number. E800 response cannot directly encounter the OHI trigger.

Table 392 Trigger interactions with E800 (Continued)

Trigger	Status	Interactions
One_Plus_Prefix	S	AIN response message can route the call to an E800 number. One_Plus_Prefix cannot be encountered after a toll-free service response. E800 toll free numbers are not oneplus prefix patterns (when oneplus is assigned to originator and they dial 1888 or 1800 the oneplus trigger is not hit).
Operator_Services	S	AIN response message can route the call to an E800 number. E800 response can encounter the OPSV prefix trigger.
PFC	S	AIN response message can route the call to an E800 number. E800 response cannot route the call and encounter the PFC trigger.
PRIB	S	AIN response message can route the call to an E800 number. E800 response cannot route the call to encounter the PRIB trigger.
SDS	S	AIN response message can route the call to an E800 number. E800 response can encounter the SDS trigger.
SFC	S	AIN response message can route the call to an E800 number. E800 response cannot route the call to encounter the SFC trigger.
SIT	S	AIN response message can route the call to an E800 number. E800 response can route the call to encounter the SIT trigger.
Specified_Carrier	S	AIN response message can route the call to an E800 number. SPECARR cannot be encountered after a toll free service response on the same SSP.
T_Busy	S	AIN response message can route the call to an E800 number. E800 response can route the call to encounter the TBSY trigger.
T_NoA	S	AIN response message can route the call to an E800 number. E800 response can route the call to encounter the TNOA trigger.
TAT	S	AIN response message can route the call to an E800 number. E800 response can route the call to encounter the TAT trigger.

Table 392 Trigger interactions with E800 (Continued)

Trigger	Status	Interactions
TRA	S	AIN response message after a TRA trigger can route the call to an E800 number. E800 response can route the call to encounter the TRA trigger.
TKTERM	S	

24.1.1.2 Event interactions with E800

Table 393 provides event interactions with E800.

Table 393 Event interactions with E800

Event	Status	Interactions
Network_Busy	S	AIN response message can route the call to an E800 number. The NB event remains open when the call is directed to an E800 number. When the E800 response routes the call to a busy trunk agent the NB event is encountered.
O_Answer	S	AIN response message can route the call to an E800 number. The OA event remains open when the call is directed to an E800 number. When the E800 response routes the call to an agent who answers the O_Answer notification is sent to the SCP.
O_CPB	S	AIN response message can route the call to an E800 number. The OCPB event remains open when the call is directed to an E800 number. When the E800 response routes the call to an agent who is busy the OCPB event is encountered.
O_NoA	S	AIN response message can route the call to an E800 number. The ONOA event remains open when the call is directed to an E800 number. When the E800 response routes the call to an agent who does not answer the ONOA event is encountered.
T_Answer	S	AIN response messages can route the call to an E800 number. The T_Answer event remains open when the call is directed to an E800 number. When the E800 response routes the call to an agent that answers the call, the T_Answer notification is sent to the SCP.

Table 393 Event interactions with E800 (Continued)

Event	Status	Interactions
T_Busy	S	AIN response message can route the call to an E800 number. The TBSY event remains open when the call is directed to an E800 number. When the E800 response routes the call to an agent who is busy the TBSY event is encountered.
T_NoA	S	AIN response message can route the call to an E800 number. The TNOA event remains open when the call is directed to an E800 number. When the E800 response routes the call to an agent who does not answer the TNOA event is encountered.

24.1.1.3 Other interactions with E800

Table 394 provides other interactions with E800.

Table 394 Other interactions with E800

Description	Status	Interactions
Collect_Information	S	Collect_Information message can route the call to the E800 service.
Analyze_Route	S	Analyze_Route message can route the call to the E800 service
Forward_Call	S	Forward_Call message can route the call to the E800 service. The forwarding agents redirection information is used to populate the E800 query.
Send_To_Resource	S	For STR with normal digit collection the originators pretranslator is used to translate the collected digits (not the E800 pretranslator)
RedirectingPartyID	S	The redirecting information is not used to populate the E800 query when this parameter is send in an Analyze Route message.
Create_Call	S	When the CalledPartyID in the Create_Call message is an E800 number, the SSP activates the E800 service and queries the E800 database.
parameter CarrierUsage	S	When a message containing an 800 number is received, parameter CarrierUsage is ignored.

24.2 Default routing

The AIN Default Routing feature, when active, dictates how to handle the call (depending on datafill, it sends the call to a treatment, an announcement, or reroutes it to another DN) after encountering an expired AIN T1 response timer or a return error message from the SCP.

This feature is not supported by either O_NoA or T_NoA.

Default Routing is not supported for the OFCPFC trigger. The call is processed normally from the next point in call.

24.3 Dialed number identification service

Dialed number identification service (DNIS) provides the delivery of additional call information to customer premise equipment (CPE). The following sections describe interactions with DNIS.

24.3.1 Trigger interactions with DNIS

Table 395 provides trigger interactions with DNIS.

Table 395 Trigger interactions with DNIS

Trigger	Status	Interactions
AFR	S	AIN triggers can be hit on a DNIS call.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	
TKTERM	S	

24.3.2 Event interactions with DNIS

Table 396 provides event interactions with DNIS.

Table 396 Event interactions with DNIS

Event	Status	Interactions
Network_Busy	S	AIN events can be armed and detected on DNIS calls.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.3.3 Other interactions with DNIS

Table 397 provides other interactions with DNIS.

Table 397 Other interactions with DNIS

Description	Status	Interactions
GAP	S	When AIN is encountered and the SCP response message updates the generic address parameter (GAP), the DNIS feature uses the GAP sent from the SCP.

24.4 Direct dialing overseas

The following sections describe interactions with direct dialing overseas (DDO).

24.4.1 Trigger interactions with DDO

Table 398 provides trigger interactions with DDO.

Table 398 Trigger interactions with DDO

Trigger	Status	Interactions
AFR	S	For DDO, triggers can be encountered on international calls dialed by the user.
CDP	S	
International	S	
N11	S	

Table 398 Trigger interactions with DDO (Continued)

Trigger	Status	Interactions
O_CPB	UU	Not applicable
O_NoA	UU	
OHD	S	For the DDO feature, triggers can be encountered on international calls dialed by the user.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	UU	Not applicable
T_NoA	UU	
TAT	S	For the DDO feature, triggers can be encountered on international calls dialed by the user.
TRA	UU	Not applicable
TKTERM	S	

24.4.2 Event interactions with DDO

Table 399 provides event interactions with DDO.

Table 399 Event interactions with DDO

Event	Status	Interactions
Network_Busy	UU	Not applicable
O_Answer	UU	
O_CPB	UU	
O_NoA	UU	
T_Answer	UU	
T_Busy	UU	
T_NoA	UU	

24.4.3 Other interactions with DDO

Table 400 provides other interactions with DDO.

Table 400 Other interactions with DDO

Description	Status	Interactions
CalledPartyID	S	In response to an AIN query, the SCP can reroute any call to an international number by assigning the appropriate value to the “Nature of Number” of the AIN CalledPartyID parameter.

24.5 Direct Inward System Access (DISA) features

- **DISA:** DISA permits selected outside callers the capability to dial from the switched network directly into DMS-100 and gain complete access to network facilities without attendant assistance.
- **DISA Reorig:** DISA reorigination allows user to make several call in a row without loosing access to the switch. After entering an Octothorpe(#) or an asterisk(*), the reorigination keys, the caller receives a standard dialtone and can dial a new sequence and account code if required. The re-origination key must be depressed for at least one second to give re-origination.
- **RESET DIALING (RDG):** Reset dialing allows the caller to correct a dialing mistake by depressing the reset key, the asterisk (*). This feature can only be activated through DISA.

24.5.1 Direct Inward System Access (DISA) features

This section applies to DISA, DISA with NFRA option, DISA with CFRA option, and DISA with RCF option.

24.5.1.1 Trigger interactions with DISA

Table 401 provides trigger interactions with DISA.

Table 401 Trigger interactions with DISA

Trigger	Status	Interactions
AFR	S	These triggers can be hit before DISA dial tone has been established. Agent, group, and office-based AFR can be hit by the DISA DN. (that is, after the DISA dial tone.)
CDP	S	
International	S	
N11	S	
O_CPB	PS	For intraswitch calls, the O_Called_Party_Busy triggers are not detected on call terminating on a virtual DN. For intraswitch calls, the O_CPB triggers cannot be detected on a re-translation made by DISA since that scenario is not supported for the AIN originating trigger. For interswitch calls, trigger O_CPB can be detected on a retranslation made by DISA since the originating party, that is subscribed to trigger O_CPB does not reside on the same switch as the terminating party and is not aware the call has been redirected at the terminating switch. After DISA is encountered on the call, OCPB can only be hit on the originating party.
O_NoA	PS	For intraswitch calls, the O_No_Answer triggers are not detected on call terminating on a virtual DN. For intraswitch calls, the O_NoA trigger cannot be detected on a retranslation made by DISA since that scenario is not supported for the AIN originating trigger. For interswitch calls, trigger O_No_Answer can be detected on a retranslation made by DISA since the originating party, that is subscribed to trigger O_No_Answer does not reside on the same switch as the terminating party and is not aware the call has been redirected at the terminating switch. After DISA is encountered on the call, OCPB can only be hit on the originating party.
OHD	S	This trigger can be hit before DISA dial tone has been established. This trigger can also be hit by the DISA DN.

Table 401 Trigger interactions with DISA (Continued)

Trigger	Status	Interactions
OHI	PS	This trigger can be hit before DISA dial tone has been established. This trigger is not supported by the DISA DN.
One_Plus_Prefix	S	These triggers can be hit before DISA dial tone has been established. These triggers can also be hit by the DISA DN.
Operator_Services	S	
PFC	PS	These triggers can be hit before DISA dial tone has been established. These triggers are not supported by the DISA DN.
PRIB	PS	
SDS	S	This trigger can be hit before DISA dial tone has been established. This trigger is also can also be hit by the DISA DN.
SFC	PS	This trigger can be hit before DISA dial tone has been established. This trigger is not supported by the DISA DN. A DISA DN is a virtual DN that cannot subscribe to trigger SFC, therefore, trigger SFC cannot be encountered.
SIT	PS	This trigger can be hit before DISA dial tone has been established. This trigger is not supported by the DISA DN.
Specified_Carrier	S	This trigger can be hit before DISA dial tone has been established. This trigger is also can also be hit by the DISA DN.
T_Busy	UU	Subscription of this trigger to a DISA DN is blocked. The trigger is not hit on calls terminating on a DISA DN. ***Note:*** These triggers can be hit on a call from a DISA DN.
T_NoA	UU	
TAT	UU	
TRA	UU	Subscription of trigger TRA to a DISA DN is blocked. The TRA trigger is not hit on calls terminating on a DISA DN. Note: Trigger TRA can be hit on a call from a DISA DN.
TKTERM	N/A	

24.5.1.2 Event interactions with DISA

Table 402 provides event interactions with DISA.

Table 402 Event interactions with DISA

Event	Status	Interactions
Network_Busy	PS	On calls that involve the attendant console when hunt group overflow (LOD or LOR) occurs, any open NELs are closed and a close message with CloseCause set to EDPs_Completed is sent to the SCP.
O_Answer	PS	
O_CPB	PS	
O_NoA	PS	
O_Disconnect	U	O_Disconnect (Calling/Controlling) cannot be armed after the call has been originated by DISA. O_Disconnect event if armed before the call has encountered DISA will be detected when the Calling party disconnects.
O_Disconnect_Called	S	O_Disconnect_Called can be armed and detected after the call has been originated by DISA.
T_Answer	UU	Terminating events cannot be armed on calls to a DISA DN, since terminating triggers are not supported on DISA DNs.
T_Busy	UU	
T_NoA	UU	
Timeout	S	As DISA does not change the topology, the feature controller and AIN controller can be the same. Timeout NEL will be detected when the call is routed to DISA DN.

24.5.1.3 Other interactions with DISA

Table 403 provides other interactions with DI

Table 403 Other interactions with DISA

Description	Status	Interactions
Send_To_Resource	PS	Calls to a DISA DN requiring authorization and account code collection from a BRI agent are not supported when there has been an intervening Send_To_Resource message involving digit collection.
Billing	S	In the case of an AIN call being routed to a DISA number: • When only the DISA is responsible for generating the originating SMDR record, no DF04 is generated. • In the case of a Forward_Call response, when DISA and TERMATT request an SMDR record, two identical SMDR records is generated.
Collect_Information	PS	When the first dial-plan element in the CollectedDigits parameter translates to a DISA DN, the call is routed to that DISA DN and any subsequent dial-plan elements are discarded. The DISA feature can then prompt the user for address digits.
ISUP optional backward call indicator (OBCI)	UU	The detection of the interswitch use of the DISA feature is made through the ISUP optional backward call indicator (OBCI) that indicate when a user interaction occurred (found in ACM and CPG message) is not supported by AIN.
Create_Call	S	**When the CallingPartyID contains a DISA DN, the Create_Call request is rejected by sending the SCP a failure message with failureCause=inappropriateUserInterface.** When the CalledPartyID maps to a DISA DN, the call behaves the same way as when the user dials the DN.

24.5.2 DISA Reorgination features

24.5.2.1 Event interactions with DISA reorig

Table 402 provides event interactions with DISA reorig.

Table 404 Event interactions with DISA reorig

Event	Status	Interactions
O_Disconnect	UU	Not Supported

Table 404 Event interactions with DISA reorig

Event	Status	Interactions
O_Disconnect_Called	UU	Not Supported
Timeout	PS	The Timeout event armed for the originator-DISA leg will not be closed. When Disconnect Response is received from the SCP/Adjunct for a Timeout EDP-R query, the call will be taken down and re-origination is not possible.

24.6 Display features

This section describes interactions with display features. See Table 180 "DMS-100 features" on page 720 for a complete list of display features.

24.6.1 Automatic display

The automatic display (AUTODISP) feature provides the automatic presentation of incoming call information (calling name, number) on the display of Meridian business sets (MBS) as calls are presented to the set.

This feature is only available on EBS, Meridian sets with display, and ISDN MFT sets.

24.6.1.1 Trigger interactions with AUTODISP

Table 405 provides trigger interactions with AUTODISP.

Table 405 Trigger interactions with AUTODISP

Trigger	Status	Interactions
AFR	S	Calls that hit these triggers can encounter AUTODISP.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	
TKTERM	N/A	

24.6.1.2 Event interactions with AUTODISP

Table 406 provides event interactions with AUTODISP.

Table 406 Event interactions with AUTODISP

Event	Status	Interactions
Network_Busy	S	Calls that arm/detect these events, can encounter AUTODISP.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.6.1.3 Other interactions with AUTODISP

Table 407 provides other interactions with AUTODISP.

Table 407 Other interactions with AUTODISP

Description	Status	Interactions
CallingPartyID	PS	When the CallingPartyID DN sent in an SCP response is different from the originating party DN then the name is not displayed. Only the CallingPartyID DN supplied by the SCP is displayed.

24.6.2 Calling line number display

The calling line number display (CLIDSP) option is available only through feature groups and allows the end user to control the format of the calling line address on business set displays. A feature group is a logical group of individual features that are packaged together to form a group and can be assigned to a line with a single SERVORD option (FTRGRP). CLIDSP is available on EBS with display, MBS and ISDN MFT sets.

Interactions that apply to CLIDSP apply equally to STD, ENH, OPT and FULL.

24.6.2.1 Trigger interactions with CLIDSP

Table 408 provides trigger interactions with CLIDSP.

Table 408 Trigger interactions with CLIDSP

Trigger	Status	Interactions
AFR	S	Calls that hit these triggers can encounter CLIDSP.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	

24.6.2.2 Event interactions with CLIDSP

Table 409 provides event interactions with CLIDSP.

Table 409 Event interactions with CLIDSP

Event	Status	Interactions
Network_Busy	S	Calls that arm and detect these events can encounter CLIDSP.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.6.2.3 Other interactions with CLIDSP

Table 410 provides other interactions with CLIDSP.

Table 410 Other interactions with CLIDSP

Description	Status	Interactions
CallingPartyID	PS	When the CallingPartyID DN sent in an SCP response is different from the originating party DN then the name is not displayed. Only the CallingPartyID DN supplied by the SCP is displayed in the appropriate format.

24.6.3 Calling name delivery blocking

The following sections describe interactions with calling name delivery blocking (CNAB).

24.6.3.1 Trigger interactions with CNAB

Table 411 provides trigger interactions with CNAB.

Table 411 Trigger interactions with CNAB

Trigger	Status	Interactions
AFR	S	This trigger can be hit on a call with CNAB.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	Trigger OHI has precedence over CNAB activation. Trigger CNAB is not encountered after trigger OHI.
One_Plus_Prefix	S	This trigger can be hit on a call with CNAB.
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	

24.6.3.2 Event interactions with CNAB

Table 412 provides event interactions with CNAB.

Table 412 Event interactions with CNAB

Event	Status	Interactions
Network_Busy	S	This event can be armed/detected on a call with CNAB
O_Answer	S	
O_CPB	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.6.3.3 Other interactions with CNAB

Table 413 provides other interactions with CNAB.

Table 413 Other interactions with CNAB

Description	Status	Interactions
Offer_Call	S	AIN DisplayText in an Offer_Call message takes precedence over CNAB, that means when AIN DT is present and contains the calling name information, CNAB has no effect.
DisplayText	S	AIN display text information takes precedence over CNAB.

24.6.4 Calling name display - CENTREX - network

This section includes the following display features:

- network dial plan display
- network name display
- networked EBS display

24.6.4.1 Network dial plan display

Network dial plan display enhances the existing display capabilities of the MBS with display by providing the capability to format a calling party's number that is consistent with the customer's dial plan. This reverse translations capability allows the called party to identify calls originating on other nodes and display the calling number in a form that is dialable by the end user.

24.6.4.1.1 Trigger interactions with network dial plan display

Table 414 provides trigger interactions with network dial plan display.

Table 414 Trigger interactions with network dial plan display

Trigger	Status	Interactions
AFR	S	Calls that hit these triggers can encounter network dial plan display.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	

24.6.4.1.2 Event interactions with network dial plan display

Table 415 provides event interactions with network dial plan display.

Table 415 Event interactions with Network dial plan display

Event	Status	Interactions
Network_Busy	S	Calls that arm and detect these events can encounter network dial plan display.
O_Answer	S	
O_CPB	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.6.4.2 Network name display

Network name display enables a MBS with display to show the calling or called party's name for direct calls in addition to the DN.

For redirected calls, network name display can display the name and reason information of the calling party or the redirected called party. This capability is provided to the users of multiple nodes linked by a common channel signaling 7 (CCS7) network to send name and DN information across the network.

This feature is available for MBS' that have 2-line by 24-character displays and for ISDN BRI and MFT sets.

24.6.4.2.1 Trigger interactions with network name display

Table 416 provides trigger interactions with network name display.

Table 416 Trigger interactions with network name display

Trigger	Status	Interactions
AFR	S	Calls that hit these triggers can encounter network name display.
CDP	S	
International	S	
N11	S	

Table 416 Trigger interactions with network name display (Continued)

Trigger	Status	Interactions
O_CPB	UU	Not applicable
O_NoA	UU	
OHD	S	Calls that hit these triggers can encounter network name display.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	UU	Not applicable
T_NoA	UU	
TAT	UU	
TRA	UU	

24.6.4.2.2 Event interactions with network name display

Table 417 provides event interactions with network name display.

Table 417 Event interactions with network name display

Event	Status	Interactions
Network_Busy	S	These events can be armed/detected on a call with network name display.
O_Answer	S	
O_CPB	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.6.4.2.3 Other interactions with network name display

Table 418 provides other interactions with network name display.

Table 418 Other interactions with network name display

Description	Status	Interactions
CallingPartyID	PS	When the CallingPartyID DN field in the CallingPartyID parameter sent in an SCP response is different from the originating party DN, then the name is not displayed. Only the CallingPartyID DN supplied by the SCP is displayed. ***Note:*** For all calls involving switch-based call forwarding except CFB, independent of AIN, the originating agent's display shows only the dialed digits temporarily until termination to the forwarded party. The dialed digits are not displayed in the case of CFB. Upon termination the originator's display then shows the terminator's name and DN, the forwarding reason, as well as the forwarding DN and name. When the CallingPartyID DN field of the CallingPartyID parameter sent in an SCP response is different from the originating party DN, one of the following scenarios occurs: • When calls go over an ISUP trunk using the query method, the terminating agent displays the CallingPartyID DN supplied by the SCP and displays the name associated with the originating DN. • After call transfer and recall or after executive busy override (EBO), the display shows the originating DN instead of the SCP supplied CallingPartyID DN. • Although switch datafill indicates that the SETUP method should be used to obtain the name, when the name is not available, then the QUERY method is used for EBS sets.

24.6.4.3 Networked EBS display

Networked EBS display provides address information across a public network and between networks for EBS sets. Network EBS display is possible through information exchange over a public network with the CCS7 signaling protocol. Address information is available for such features as normal line-to-line call, call waiting (CWT), call pickup (CPU), call transfer (CXR), and call forwarding (CFX).

Note: For all calls involving switch-based call forwarding except CFB, independent of AIN, the originating agent's display shows only the dialed digits temporarily until termination to the forwarded party. The dialed digits are not displayed in the case of CFB. Upon termination the originator's display then shows the terminator's name and DN, the forwarding reason, as well as the forwarding DN and name.

24.6.4.3.1 Trigger interactions with networked EBS display

Table 419 provides trigger interactions with Networked EBS display.

Table 419 Trigger interactions with networked EBS display

Trigger	Status	Interactions
AFR	S	Not applicable
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	UU	Not applicable

24.6.4.3.2 Event interactions with networked EBS display

Table 420 provides event interactions with networked EBS display.

Table 420 Event interactions with networked EBS display

Event	Status	Interactions
Network_Busy	UU	Not applicable
O_Answer	UU	
O_CPB	UU	
O_NoA	UU	
T_Answer	UU	
T_Busy	UU	
T_NoA	UU	

24.6.4.3.3 Other interactions with networked EBS display

Table 421 on page 984 provides other interactions with networked EBS display.

Table 421 Other interactions with networked EBS display

Description	Status	Interactions
CallingPartyID	PS	When the CallingPartyID DN sent in an SCP response is different from the originating party DN and the Presentation Restriction Indicator field is presentation_restricted then the terminating agent displays the message “OUTSIDE CALL”.

24.6.5 Name and reason display

The name and reason display (READISP) feature allows a name and reason to be displayed for incoming and outgoing calls on a Meridian business set (MBS) with display. Parties originating a call are able to see the name of the called party. Parties receiving a call are able to see the name of the calling party.

READISP is available for the Meridian business sets (MBS) that have 2-line by 24-character displays, and for ISDN BRI and MFT sets.

24.6.5.1 Trigger interactions READSDISP

Table 422 provides trigger interactions with READSDISP.

Table 422 Trigger interactions with READSDISP

Trigger	Status	Interactions
AFR	S	When a call hits these triggers, READSDISP can be encountered.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	

24.6.5.2 Event interactions with REASDISP

Table 423 provides event interactions with REASDISP.

Table 423 Event interactions with REASDISP

Event	Status	Interactions
Network_Busy	S	When a call arms and detects this event, REASDISP can be encountered.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.6.5.3 Other interactions with READSDISP

Table 424 provides other interactions with READSDISP.

Table 424 Other interactions with READSDISP

Description	Status	Interactions
CallingPartyID	PS	When the CallingPartyID DN sent in an SCP response is different from the originating party DN and the Presentation Restriction Indicator is presentation-restricted, then the terminating agent displays the message `OUTSIDE CALL' for EBS sets and `PRIVATE CALL' for RES lines. When the CallingPartyID DN sent in an SCP response is different from the originating party DN and the Presentation Restriction Indicator is presentation-allowed, then the terminating agent displays the CallingPartyID DN, name and reason. When the CallingPartyID DN sent in an SCP response is the same as the originating party DN and the Presentation Restriction Indicator is presentation-restricted, then the terminating agent displays the CallingPartyID name and reason. When the CallingPartyID DN field is sent in an SCP response and it is the same as the originating party DN, or the CallingPartyID parameter is invalid or absent then one of the following occurs: • Switch-based call forwarding affects the originating agent's display. The originator's display shows the dialed digits with the exception of CFB. Upon termination to the forwarded agent, the terminator's DN, name, forward reason display, and forwarding agent's DN and name are displayed. • When an Authorize_Termination response is received and switch-based call forwarding has taken place, then the originator’s display shows the dialed digits with the exception of CFB. Upon termination, to the forwarded agent, the display is not updated. When the CallingPartyID DN field in the CallingPartyID parameter sent in an SCP response is the same as the originating party DN and the SCP Presentation Restriction Indicator is presentation-restricted, then the reason is not displayed.

24.6.6 PX (trunks) calling line identification

PX (trunks) calling line identification (PXCLID) is an originating end-office feature that allows the presentation of calling line identification (CLID) for example, name and number display, on calls originating from PX trunks (on a

per-trunk group basis). PXCLID provides the option of blocking the presentation of CLID on calls of this type, also on a per-trunk group basis.

24.6.6.1 Trigger interactions PXCLID

Table 425 provides trigger interactions with PXCLID.

Table 425 Trigger interactions with PXCLID

Trigger	Status	Interactions
AFR	S	This trigger can be hit on a trunk with PXCLID.
CDP	NA	This trigger is not supported on PX trunks.
International	S	These triggers can be hit on a trunk with PXCLID. The PXCLID information is used to populate the AIN CallingPartyid parameter in the query message for these triggers.
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	Unsupported and untested.
OHI	NA	This trigger is not supported on PX trunks.
One_Plus_Prefix	S	This trigger can be hit on a trunk with PXCLID. The PXCLID information is used to populate the AIN CallingPartyid parameter in the query message for these triggers.
Operator_Services	S	
PFC	NA	This trigger is not supported on PX trunks.
PRIB	NA	
SDS	S	These triggers can be hit on a trunk with PXCLID. The PXCLID information is used to populate the AIN CallingPartyid parameter in the query message for these triggers
SFC	S	
SIT	NA	This trigger is not supported on PX trunks.
Specified_Carrier	S	These triggers can be hit on a trunk with PXCLID. The PXCLID information is used to populate the AIN CallingPartyid parameter in the query message for these triggers
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	Trigger TRA can be encountered on a trunk with PXCLID. PXCLID information is used to populate the AIN CallingPartyID parameter in the query message.

24.6.6.2 Event interactions with PXCLID

Table 426 provides event interactions with PXCLID.

Table 426 Event interactions with PXCLID

Event	Status	Interactions
Network_Busy	S	These events can be armed/detected on a trunk with PXCLID.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.6.6.3 Other interactions with PXCLID

Table 427 provides other interactions with PXCLID.

Table 427 Other interactions with PXCLID

Description	Status	Interactions
DisplayText	U	When parameter AIN DisplayText is received in an AIN response, AIN DisplayText and PXCLID information is ignored and “Unknown name” “Unknown number” is displayed on the terminating agent. When an MDC set is the terminating agent, only “Unknown name” is displayed (this is a limitation with the MDC agent).
CallingPartyID	S	When parameter AIN CallingPartyid is received in an AIN response message, it takes precedence over the PXCLID number. When parameter AIN CallingPartyID is received and matches the PXCLID number, the PXCLID name ‘information’ is used.

24.6.7 Redirecting number and reason delivery for ISDN call forward

The following sections describe interactions with redirecting number and reason delivery (RND) for ISDN call forward.

24.6.7.1 Trigger interactions with RND

Table 428 provides trigger interactions with RND.

Table 428 Trigger interactions with RND

Trigger	Status	Interactions
AFR	UU	AIN is not supported by this feature. When an AIN redirection occurs in the call, the AIN redirection information returned in the SCP response is not delivered to the BRI terminal.
CDP	UU	
International	UU	
N11	UU	
O_CPB	UU	
O_NoA	UU	
OHD	UU	
OHI	UU	
One_Plus_Prefix	UU	
Operator_Services	UU	
PFC	UU	
PRIB	UU	
SDS	UU	
SFC	UU	
SIT	UU	
Specified_Carrier	UU	
T_Busy	UU	
T_NoA	UU	
TAT	UU	
TRA	UU	

24.6.7.2 Event interactions with RND

Table 429 provides event interactions with RND.

Table 429 Event interactions with RND

Event	Status	Interactions
Network_Busy	UU	AIN is not supported by this feature. When an AIN redirection occurs in the call, the AIN redirection information returned in the SCP response is not delivered to the BRI terminal.
O_Answer	UU	
O_CPB	UU	
O_CPB	UU	
O_NoA	UU	
T_Answer	UU	
T_Busy	UU	
T_NoA	UU	

24.6.8 Special handling of presentation restricted number

Special handling of presentation restricted number (SHPRN) is a an option that provides the DMS-100 switch with the ability to override the delivery of presentation restricted numbers. Under specific conditions, calls offered to either a single PRI or a serving PRI group can override the delivery restrictions and provide a MSR or IP (intelligent peripheral) with the calling number (CGN) and/or the redirecting number(s) RN.

24.6.8.1 Trigger interactions with SHPRN

Table 430 provides trigger interactions with SHPRN.

Table 430 Trigger interactions with SHPRN

Trigger	Status	Interactions
AFR	S	When AIN is involved in the call, the CGN and RN information in the AIN response is used. The SHPRN feature can override the delivery of the AIN information based on the features CGNDELV and RNDELV provisioned against the corresponding PRI trunk.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	

24.6.8.2 Event interactions with SHPRN

Table 431 provides event interactions with SHPRN.

Table 431 Event interactions with SHPRN

Event	Status	Interactions
Network_Busy	S	When AIN is involved in the call, the CGN and RN information in the AIN response is used. The SHPRN feature can override the delivery of the AIN information based on the features CGNDELV and RNDELV provisioned against the corresponding PRI trunk.
O_Answer	S	
O_CPB	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.7 Distinctive ringing

Distinctive ringing (DRING) applies a distinctive ringing pattern to the called party.

24.7.1 Trigger interactions with DRING

Table 432 provides trigger interactions with DRING.

Table 432 Trigger interactions with DRING

Trigger	Status	Interactions
AFR	S	Calls that hit these triggers can encounter distinctive ringing.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	
TKTERM	N/A	

24.7.2 Event interactions with DRING

Table 433 provides event interactions with DRING.

Table 433 Event interactions with DRING

Event	Status	Interactions
Network_Busy	S	Calls that arm and detect these events can encounter distinctive ringing.
O_Answer	S	
O_CPB	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.7.3 Other interactions with DRING

Table 434 provides other interactions with DRING.

Table 434 Other interactions with DRING

Description	Status	Interactions
ControllingLegTreatment	PS	When either of these parameters is present in a response from the SCP, then the ringing patterns specified in these parameters is used instead of the switch-based Ringing patterns. See Section 21.4.2 “AIN distinctive alerting and call waiting” on page 732.
PassiveLegTreatment	PS	
Create_Call	S	When optional parameter ControllingLegTreatment is included in the Create_Call message, the value specified in this parameter overrides switch-based distinctive ringing features. When optional parameter ControllingLegTreatment is not included in the Create_Call message, the default “Alert Pattern 0” is alerts the originator. Switch-based DRING does not apply.

24.8 Dual line call management

Dual line call management (DLCM) is useful in a work-at-home environment where end-users have a business line that is separate from their residential line.

Typically, different phone sets are connected to each line and are usually located indifferent places on the same premises. DLCM allows a call directed to a specific line to be answered on an associated line, and retrieved from the specific line. Simultaneous ringing, call hold, and call answer functions are provided under this feature.

Note 1: All AIN terminating triggers applicable on the call before the Present_Call PIC #14, have precedence over the DLCM feature on the call extended to the DLCM subscriber line.

Note 2: DLCM feature does not activate when the DN dialed is busy.

24.8.1 Trigger interactions with DLCM

Table 435 provides trigger interactions with DLCM.

Table 435 Trigger interactions with DLCM

Trigger	Status	Interactions
AFR	S	DLCM and originating triggers are independent of each other. When an originating AIN trigger is encountered on a call, DLCM's behavior remains unchanged. AIN triggers are not encountered when the call is extended to the DLCM associate line via simultaneous ringing.
CDP	S	
International	S	
N11	S	
O_CPB	S	DLCM operates independently of trigger O_CPB. DLCM does not activate when the called party is busy.
O_NoA	S	Trigger O_No_Answer is encountered only when both the CMG line and it's associate do not answer the call. AIN triggers are not encountered when the call is extended to the DLCM associate line via simultaneous ringing.

Table 435 Trigger interactions with DLCM (Continued)

Trigger	Status	Interactions
OHD	S	DLCM and originating triggers are independent of each other. When an originating AIN trigger is encountered on a call, DLCM's behavior remains unchanged. AIN triggers are not encountered when the call is extended to the DLCM associate line via simultaneous ringing.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	DLCM operates independently of trigger T_Busy. DLCM does not activate when the called party is busy.
T_NoA	S	When the dialed DN is subscribed to trigger T_No_Answer and both the CMG line and it's associate do not answer the call, trigger T_No_Answer is encountered. AIN triggers are not encountered when the call is extended to the DLCM associate line via simultaneous ringing.
TAT	S	When the CMG line or it's associate subscribe to TAT then TAT is hit only when the dialed DN is the DN subscribed to TAT. AIN triggers are not encountered when the call is extended to the DLCM associate line via simultaneous ringing.
TRA	S	TRA takes precedence over DLCM.
TKTERM	N/A	

24.8.2 Event interactions with DLCM

Table 436 provides event interactions with DLCM.

Table 436 Event interactions with DLCM

Event	Status	Interactions
O_Disconnect	UU	Not Supported
O_Disconnect_Called	UU	
Timeout	UU	
Network_Busy	S	This event can be arm and detected on a call to a DLCM line.
O_Answer	S	The O_Answer event is detected when either the CMG line or it's associate answers the call.
O_CPB	S	DLCM operates independently of the O_CPB event. DLCM does not activate when the called party is busy.
O_NoA	S	The O_No_Answer event is detected only when both the CMG line and it's associate do not answer the call.
T_Answer	S	The T_answer event is detected when either the CMG line or it's associate answers the call.
T_Busy	S	DLCM operates independently of the T_Busy event. DLCM does not activate when the called party is busy.
T_NoA	S	The T_No_Answer Event is detected when both the CMG line and it's associate do not answer the call.

24.8.3 Other interactions with DLCM

Table 437 provides other interactions with DLCM.

Table 437 Other interactions with DLCM

Event	Status	Interactions
Extended Ringing	S	O_NoA is detected on a DLCM subscriber when both lines do not answer. ER functionality is invoked when applicable.
Create_Call	S	When alerting the originator, DLCM does not activate.

24.9 Extended Ringing to External IP

This section describes interaction with the Extended Ringing to External IP feature.

24.9.1 Automatic Call Back (ACB) and Automatic Recall (AR)

These features allow a subscriber to automatically place a second call to the same station after the first call has terminated. O_NoA or T_NoA encountered on the first call has no influence on ACB or AR.

AIN interaction with ACB and AR is provided through SOC AIN00018.

24.9.2 Additional Call Offering Unconditional (ACOU)

A call that is routed to a line subscribed to ACOU can encounter O_NoA or T_NoA and invoke extended ringing function.

24.9.3 Flexible Call (FC)

Flexible calling is a set of capabilities that allow ISDN users to establish and control two or more concurrent calls. Establishing a conference call during STR response processing deactivates extended ringing functionality.

24.9.4 Class features

This section describes class feature interactions with extended ringing.

Table 438 Interactions with Class features

Feature	Interaction with Extended Ringing
Anonymous Call Rejection (ACRJ)	Detection of O_NoA is based on the state of the line after processing ACRJ, SCA, or SCRJ. When the state is ringing and O_NoA is encountered, the STR/IP response message is processed and extended ringing is invoked, if applicable. The T_NoA trigger is not detected when the call is rejected by these features.
Selective Call Acceptance (SCA)	
Selective Call Rejection (SCRJ)	

Table 438 Interactions with Class features

Feature	Interaction with Extended Ringing
Calling Name Delivery Blocking (CNAB)	No interaction.
Calling Number Delivery Blocking (CNDB)	
Calling Number Blocking (CNB)	
Calling Number Delivery (CND)	
Calling Name and Number Blocking (CNNB)	
Calling Name and Number Delivery (CNND)	
Dialable Directory Number Delivery (DDND)	
TCAP Name Delivery (TCAPND)	
Call Blocking	No interaction. O_NoA and T_NoA are not encountered when call blocking is activated.

24.9.5 Redirecting features

This section describes redirecting feature interactions with extended ringing.

Table 439 Interactions with Redirecting features

Feature	Interaction with Extended Ringing
Call Forward Don't Answer (CFD)	For intraiswitch operation, when CFD or CFDA is detected on the terminator's line, the O_NoA timer is compared to the CFD/CFDA timer. The feature with the smaller timer value will be invoked first, followed by the other feature.
Call Forward Don't Answer (CFDA)	
Call Forward Timer (CFTD)	
Call Forward Don't Answer (CFGD)	After a call is forwarded by CFGD, in case INTERNAL=YES, when the extended ringing SOCs are ON, when the terminator doesn't answer, O_NoA trigger/event timer is set to CFGD timer +2 seconds when the CFGD timer expires. O_NoA can be invoked only when a call is terminated on the last member of a hunt group. When STR/IP with ER is received, ER is applied to the terminator.

Table 439 Interactions with Redirecting features

Feature	Interaction with Extended Ringing
Call Forward (CFW)	For CFW validation with termination validation, the call can encounter O_NoA or T_NoA, and when an STR/IP message is received with ER, ringing is provided to the called DN. When the called DN answers, the programming succeeds (for example, validation passes). The called DN is not programmed (for example, validation fails) when an STR/IP message is received with no ER parameter.
Call Forward Timer (CFTB)	No interaction.
Call Forward Programmable (CFWP)	
Call Forward Universal (CFU)	
Call Forward Busy (CFB)	
Call Forward Busy Line (CFBL)	
Selective Call Forwarding (SCF)	

24.9.6 Called Number Display

The called number or name displayed on the caller's station is not overwritten when the call encounters O_NoA or T_NoA with ER functionality.

24.9.7 Conference features

This section describes interactions of conference features with extended ringing.

Table 440 Interactions with Conference features

Feature	Interaction with Extended Ringing
Three-Way Call (3WC)	When O_NoA or T_NoA is encountered during the process of establishing the second leg of a three-way call, if an STR/IP with ER message is received, it is not processed and a resource_clear with clear_cause "ABORT" is sent to SCP.
Usage sensitive Three-Way Call (U3WC)	
Call Transfer (CXR)	Trigger O_NoA or T_NoA can only be hit before the controller transfers the call. While the call is connected to the IP, the call cannot be transferred. All transfer attempts are ignored.

24.9.8 Call Pickup features

This section describes interactions of call pickup and directed call pickup with extended ringing.

When O_NoA or T_NoA is invoked during the ringing stage and STR/IP with ER is received in response, extended ringing is applied. When a different terminating agent (agent having CPU) answers, a resource_clear message with clear_cause “Called party answered” is sent to SCP and the agents are connected.

24.9.9 Call Waiting features

This section describes interactions of call waiting with extended ringing.

The Extended Ringing feature does not modify the support of call waiting on the calling party. That is, if the calling party is in an audible ringing, play announcement, or collect digit state, the calling party will not be alerted of an incoming call and the incoming caller will receive busy treatment.

Table 441 Interactions with call waiting features

Feature	Interaction with Extended Ringing
Call Waiting (CWT)	The CWT or CWI subscriber will hear the alerting tone and is able to hook flash (placing the current call on hold) to accept the new call.
Call Waiting Intragroup (CWI)	
Cancel Call Waiting (CCW)	O_NoA or T_NoA is not detected; ER is not applicable if the terminator has invoked CCW since the line is considered busy.

24.9.10 Default Routing

Default routing does not support O_NoA or T_NoA.

24.9.11 Dual Line Call Management

Dual line call management interacts with O_NoA or T_NoA when both lines do not answer.

24.9.12 Hook Flash

Hook flashes attempted during the processing of the STR/IP response are ignored.

24.9.13 Multiple Appearance DN

When an O_NoA or T_NoA agent calls a MADN group, all group members are alerted and are continued to be alerted when O_NoA or T_NoA is encountered and a STR/IP with ER is received.

24.9.14 Messaging features

This section describes interactions of Access to Messaging or Special Delivery Service (SDS) and In-Session Activation (ISA) with extended ringing.

The AIN O_NoA and T_NoA events and triggers have precedence over SDS and ISA. ISA features are permanently deactivated when a T_NoA or O_NoA event is received. SDS is permanently deactivated when an O_NoA trigger or event is received, however SDS can be invoked when a continue message is sent by the SCP for the T_NoA trigger or EDPR.

The SSP will send a resource_clear message in response to an STR/IP message once that message is processed. The ISA and SDS features are not invoked even if a continue message is received in response to the resource_clear message.

24.9.15 Spontaneous Call Waiting Identification

This section describes interactions of Spontaneous Call Waiting Identification (SCWID) and Deluxe SCWID (DSCWID) with extended ringing.

Table 442 Interactions with call waiting features

Feature	Interaction with Extended Ringing
Spontaneous Call Waiting Identification (SCWID)	The SCWID subscriber will hear the alerting tone and is able to hook flash (placing the current call on hold) to accept the new call.
Deluxe Spontaneous Call Waiting Identification (DSCWID)	Extended ringing applies until the subscriber selects one of the DSCWID disposition options. When an option has been selected, extended ringing treats the call as if the called party answered.

24.9.16 Simultaneous Ringing

When extended ringing is encountered, the SSP will send a resource_clear message with reason “abort” in response to an STR/IP message.

24.10 Emergency service features

This section describes interactions with emergency service features. See Table 180 “DMS-100 features” on page 720 for a complete list of emergency service features.

24.10.1 911PREFDN

The 911PREFDN option is only supported on NIPRI PRI agents. It allows the telephone operating company to assign a default calling party DN for incoming (to the DMS-100 switch) 911 calls.

24.10.1.1 Trigger interactions with 911PREFDN

Table 446 provides trigger interactions with 911PREFDN.

Table 443 Trigger interactions with 911PREFDN

Trigger	Status	Interactions
AFR	S	These triggers can be hit on calls originated from a PRI interface with the E911PREFDN option.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	NA	OHI is not supported on PRI agents.
One_Plus_Prefix	S	These triggers can be hit on calls originated from a PRI interface with the E911PREFDN option.
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	NA	SIT is not supported on PRI agents.
Specified_Carrier	S	These triggers can be hit on calls originated from a PRI interface with the E911PREFDN option.
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	Trigger TRA can be encountered on calls originated from a PRI interface with the E911PREFDN option.
TKTERM	N/A	

24.10.1.2 Event interactions with 911PREFDN

Table 447 provides event interactions with 911PREFDN.

Table 444 Event interactions with 911PREFDN

Event	Status	Interactions
Network_Busy	S	These events can be armed/detected on calls originated from a PRI interface with the 911PREFDN option.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.10.1.3 Other interactions with 911PREFDN

Table 448 provides other interactions with 911PREFDN.

Table 445 Other interactions with 911PREFDN

Description	Status	Interactions
CallingPartyID	S	Whenever the 911PREFDN calling party ID is used in an incoming PRI call, it is also used to populate the CallingPartyID field in AIN query messages. When the SCP responds with a new CallingPartyID, the new SCP CallingpartyID overrides 911PREFDN CallingpartyID.

24.10.2 Emergency service line

Emergency service line (ESL) is a line option that can be assigned to POTS lines. Lines with the ESL option can be used to answer emergency calls because they provide functionality such as call control and ringback.

Note: No AIN triggers are encountered during ringback by the ESL.

CAUTION
Possible loss of service
AIN terminating triggers must not be assigned to ESL lines.

24.10.2.1 Trigger interactions with ESL

Table 446 provides trigger interactions with ESL.

Table 446 Trigger interactions with ESL

Trigger	Status	Interactions
AFR	S	A call that encounters these triggers can terminate on an ESL line without affecting ESL functionality. ESL lines cannot make outgoing calls, therefore, triggers cannot be encountered when an ESL goes offhook and attempts to originate a call.
CDP	S	
International	S	
N11	S	
O_CPB	S	Trigger OCPB can be encountered when the call terminates on a busy ESL line. ESL lines cannot make outgoing calls, therefore, triggers cannot be encountered when an ESL goes offhook and attempts to originate a call.
O_NoA	S	Trigger ONA can be encountered when the call terminates on an ESL line that does not answer. ESL lines cannot make outgoing calls, therefore, triggers cannot be encountered when an ESL goes offhook and attempts to originate a call.
OHD	S	A call that encounters these triggers can terminate on an ESL line without affecting ESL functionality. ESL lines cannot make outgoing calls, therefore, triggers cannot be encountered when an ESL goes offhook and attempts to originate a call. When a subscriber dials 911, the OHD trigger will not be hit when 911 is on the escape code list.
OHI	S	OHI cannot be assigned to an ESL line through servord.ESL lines cannot make outgoing calls, therefore, triggers cannot be encountered when an ESL goes offhook and attempts to originate a call. A call that encounters OHI can terminate on an ESL line.
One_Plus_Prefix	S	A call that encounters these triggers can terminate on an ESL line and the ESL functionality is not affected. ESL lines cannot make outgoing calls, therefore, triggers cannot be encountered when an ESL goes offhook and attempts to originate a call.
Operator_Services	S	
PFC	S	
PRIB	S	A call that encounters these triggers can terminate on an ESL line and the ESL functionality is not affected. ESL lines cannot make outgoing calls, therefore, triggers cannot be encountered when an ESL goes offhook and attempts to originate a call. When a subscriber dials 911, the PRIB trigger will not be hit when 911 is on the escape code list.

Table 446 Trigger interactions with ESL (Continued)

Trigger	Status	Interactions
SDS	S	A call that encounters these triggers can terminate on an ESL line and the ESL functionality is not affected. ESL lines cannot make outgoing calls, therefore, triggers cannot be encountered when an ESL goes offhook and attempts to originate a call.
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	U	Terminating triggers must not be assigned to a line with the ESL line option. Assigning a terminating trigger to an ESL line affects ESL service. ESL lines cannot make outgoing calls. Triggers cannot be encountered when an ESL goes offhook and attempts to originate a call.
T_NoA	U	
TAT	U	
TRA	U	TRA trigger cannot be assigned to a line with the ESL line option. ESL lines cannot make outgoing calls.
TKTERM	N/A	

24.10.2.2 Event interactions with ESL

Table 447 provides event interactions with ESL.

Table 447 Event interactions with ESL

Event	Status	Interactions
O_Disconnect	S	The O_Disconnect EDP-R message will not be sent when call is terminated to an ESL, and NEL will be closed with closecause of “eDPsCompleted”.
O_Disconnect_Called	S	The O_Disconnect_Called EDP-R message will not be sent when call is terminated to an ESL, and NEL will be closed with closecause of “eDPsCompleted”.
Timeout	S	The Timeout EDP-R message will not be sent when call is terminated to an ESL, and NEL will be closed with closecause of “eDPsCompleted”.
Network_Busy	S	These events can be armed and encountered on a call to an ESL line without affecting the ESL functionality. ESL lines cannot make outgoing calls, therefore, events cannot be armed when an ESL goes offhook and attempts to originate a call.
O_Answer	S	
O_CPB	S	
O_CPB	S	
O_NoA	S	

Table 447 Event interactions with ESL

Event	Status	Interactions
T_Answer	U	ESL is not supported for terminating triggers, therefore, these events cannot be armed or encountered.
T_Busy	U	
T_NoA	U	

24.10.2.3 Other interactions with ESL

Table 448 provides other interactions with ESL.

Table 448 Other interactions with ESL

Description	Status	Interactions
AIN Billing	S	The elapsed time in the AIN billing record corresponds to the initial onhook by the originator, regardless of whether or not they are re-connected through ringback by the ESL.
Analyze_Route	S	AR, FC, and CI responses can be used to direct a call to an ESL line without affecting the ESL functionality.
Forward_Call	S	
Collect_Information	S	
Create_Call	S	When the originator has ESL, the Create_Call request is rejected by sending the SCP a failure message with failureCause=inappropriateUserInterface.

24.10.3 Enhanced 911 emergency service

CAUTION
Possible loss of service
Loss of service can occur when E911 is not used with AIN as described in the supported scenarios that follow.

The following section describes interactions with enhanced 911 emergency service.

24.10.3.1 Trigger interactions with enhanced 911 emergency service

Table 449 provides trigger interactions with enhanced 911 emergency service.

Table 449 Trigger interactions with enhanced 911 emergency service

Trigger	Status	Interactions
AFR	PS	Supported interactions between E911 and AFR follow. This trigger can be encountered on calls originating from a PSAP (See Note at the bottom of this table). When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=911. Ringback is supported (between the PSAP and the triggering switch). When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=911 and PrimaryCarrier=0110. Ringback is supported (between the PSAP and the triggering switch). When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=PSAP DN and ANNONCALL=YES. Ringback is not supported.
CDP	PS	Supported interactions between E911 and CDP follow. This trigger can be encountered on calls originating from a PSAP (see Note at the bottom of this table) This trigger can be hit during PSAP call transfer. Ringback is not supported. When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=911. Ringback is supported (between the PSAP and the triggering switch). When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=PSAP DN and ANNONCALL=YES. Ringback is not supported. When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=911 and PrimaryCarrier=0110. Ringback is supported (between the PSAP and the triggering switch). When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=PSAP DN and PrimaryCarrier=0110. Ringback is not supported.

Table 449 Trigger interactions with enhanced 911 emergency service (Continued)

Trigger	Status	Interactions
International	UU	Not applicable
N11	PS	Supported interactions between E911 and N11 follow. This trigger can be encountered on calls originating from a PSAP (see Note at the bottom of this table). When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=911. Ringback is supported (between the PSAP and the triggering switch). When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=PSAP DN and ANNONCALL=YES. Ringback is not supported. When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=911 and PrimaryCarrier=0110. Ringback is supported (between the PSAP and the triggering switch). When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=PSAP DN and PrimaryCarrier=0110. Ringback is not supported.
O_CPB	UU	Not applicable
O_NoA	UU	Not applicable

Table 449 Trigger interactions with enhanced 911 emergency service (Continued)

Trigger	Status	Interactions
OHD	PS	Supported interactions between E911 and OHD follow. This trigger can be encountered on calls originating from a PSAP (see Note at the bottom of this table). This trigger can be hit during PSAP call transfer. Ringback is not supported. When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=911. Ringback is supported (between the PSAP and the triggering switch). When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=PSAP DN and ANNONCALL=YES. Ringback is not supported. When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=911 and PrimaryCarrier=0110. Ringback is supported (between the PSAP and the triggering switch). When 911 is on the escape code list, a subscriber can escape trigger OHD by dialing 911.
OHI	PS	Supported interactions between E911 and OHI follow. This trigger can be encountered on calls originating from a PSAP (see Note at the bottom of this table). This trigger can be hit during PSAP call transfer. Ringback is not supported. When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=911. Ringback is supported (between the PSAP and the triggering switch). When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=PSAP DN and ANNONCALL=YES. Ringback is not supported. When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=911 and PrimaryCarrier=0110. Ringback is supported (between the PSAP and the triggering switch).
One_Plus_Prefix	UU	Not applicable
Operator_services	UU	Not applicable

Table 449 Trigger interactions with enhanced 911 emergency service (Continued)

Trigger	Status	Interactions
PFC	UU	Not applicable
PRIB	PS	Supported interactions between E911 and PRIB follow. When a subscriber dials 911, the PRIB trigger can be escaped when 911 is on the escape code list.
SDS	PS	Supported interactions between E911 and SDS follow. When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=911. Ringback is supported (between the PSAP and the triggering switch). When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=PSAP DN and ANNONCALL=YES. Ringback is not supported. When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=911 and PrimaryCarrier=0110. Ringback is supported (between the PSAP and the triggering switch). When this trigger is hit, the call can be routed to the PSAP when the SCP returns an Analyze_Route response with CalledPartyID=PSAP DN and PrimaryCarrier=0110. Ringback is not supported.
SFC	UU	Not applicable
SIT	UU	Not applicable
Specified_Carrier	UU	Not applicable
T_Busy	UU	Not applicable
T_NoA	UU	Not applicable

Table 449 Trigger interactions with enhanced 911 emergency service (Continued)

Trigger	Status	Interactions
TAT	PS	Supported interactions between E911 and TAT follow. Calls to 911 that hit the TAT assigned to the PSAP, and receive an Authorize_termination response. Ringback is supported. Calls to 911 that hit the TAT assigned to the PSAP, and receive a Forward_Call to another PSAP. Ringback is not supported. Calls to the PSAP DN with ANNONCALL=YES, that hit the TAT trigger assigned to the PSAP, and receive and Authorize_termination response. Ringback is not supported. Calls to the PSAP DN with ANNONCALL=YES, that hit the TAT trigger assigned to the PSAP and receive a Forward_Call response to another PSAP. Ringback is not supported. Calls to the PSAP DN with ANNONCALL=NO will not hit the TAT trigger assigned to the PSAP. When this trigger is hit, the call can be routed to the PSAP when the SCP returns a Forward_Call response with CalledPartyID=911. Ringback is supported (between the PSAP and the triggering switch). When this trigger is hit, the call can be routed to the PSAP when the SCP returns a Forward_Call response with CalledPartyID=PSAP DN, and ANNONCALL=YES. Ringback is not supported. ***Note:*** Trigger TAT is not supported on all PSAP agent types.
TRA	UU	Not applicable
TKTERM	N/A	
Note: Specifically, these lines make up the MLHG for a line-ended PSAP or LDT PSAP, or the secondary DN for ACD PSAPs.		

24.10.3.2 Event interactions with enhanced 911 emergency service

Table 450 provides event interactions with enhanced 911 emergency service.

Table 450 Event interactions with enhanced 911 emergency service

Event	Status	Interactions
O_Disconnect	S	The O_Disconnect EDP-R message will not be sent for an E911 call. The event will be closed with closecause 'eDPsCompleted'.
O_Disconnect_Called	S	The O_Disconnect_Called EDP-R message will not be sent for an E911 call. The event will be closed with closecause 'eDPsCompleted'.
Timeout	S	The Timeout EDP-R message will not be sent for an E911 call. The event will be closed with closecause 'eDPsCompleted'.
Network_Busy	UU	Not applicable
O_Answer	UU	
O_CPB	UU	
O_NoA	UU	
T_Answer	UU	
T_Busy	UU	
T_NoA	UU	

Note: These lines make up the MLHG for a line-ended PSAP, LTD PSAP or the secondary DN for ACD PSAPs.

24.10.3.3 Other interactions with enhanced 911 emergency service

Table 451 provides other interactions with enhanced 911 emergency service.

Table 451 Other interactions with enhanced 911 emergency service

Description	Status	Interactions
Collect_Information	S	When the CollectedDigits parameter contains the digits '911' that correspond to the emergency service, the SSP routes the call using the E911 service.
Create_Call	S	When the CalledPartyID in the Create_Call message contains digits '911', the call routes the same as when the originator dialed the digits.

24.10.4 Enhanced 911 PSAP call forward log

Enhanced 911 (E911) PSAP call forward log generates a log specifically for line appearance on a digital trunk (LDT) and line public safety answering points (PSAPs), whenever a call is forwarded on either a Busy or No Answer condition.

24.10.4.1 Trigger interactions with E911 PSAP call forward log

Table 452 provides trigger interactions with E911 PSAP call forward log.

Table 452 Trigger interactions with E911 PSAP call forward log

Trigger	Status	Interactions
AFR	UU	When the call is forwarded from a PSAP by AIN on either a Busy or No Answer condition, the log is not generated.
CDP	UU	
International	UU	
N11	UU	
O_CPB	UU	
O_NoA	UU	
OHD	UU	
OHI	UU	
One_Plus_Prefix	UU	
Operator_Services	UU	
PFC	UU	
PRIB	UU	
SDS	UU	
SFC	UU	
SIT	UU	
Specified_Carrier	UU	
T_Busy	UU	
T_NoA	UU	
TAT	UU	

Table 452 Trigger interactions with E911 PSAP call forward log (Continued)

Trigger	Status	Interactions
TRA	UU	Not applicable
TKTERM	N/A	

24.10.4.2 Event interactions with E911 PSAP call forward log

Table 453 provides event interactions with E911 PSAP call forward log.

Table 453 Event interactions with E911 PSAP call forward log

Event	Status	Interactions
Network_Busy	UU	When the call is forwarded from a PSAP by AIN on either a Busy or No Answer condition, the log is not generated.
O_Answer	UU	
O_CPB	UU	
O_CPB	UU	
O_NoA	UU	
T_Answer	UU	
T_Busy	UU	
T_NoA	UU	

24.10.5 E911 ringback

E911 ringback is only supported over incoming E911 trunks and E911 VFGs. When an E911 trunk is used, then the end-office side must also support ORIGHOLD, ES, and OP trunks. When the subscriber goes on-hook during an E911 call, the connection is not taken down and dialing the Ringback feature access code by the E911 attendant can cause the subscriber's set to ring again. When the attendant uses Ringback while the subscriber is off-hook, Receiver Off-Hook treatment is applied to the subscriber.

E911 Ringback is not supported over IT trunks.

24.10.5.1 Trigger interactions with E911 ringback

Table 454 provides trigger interactions with E911 ringback.

Table 454 Trigger interactions with E911 ringback

Trigger	Status	Interactions
AFR	UU	Not applicable
CDP	UU	
International	UU	
N11	UU	
O_CPB	UU	
O_NoA	UU	
OHD	UU	
OHI	UU	
One_Plus_Prefix	UU	
Operator_Services	UU	
PFC	UU	
PRIB	UU	
SDS	UU	
SFC	UU	
SIT	UU	
Specified_Carrier	UU	
T_Busy	UU	
T_NoA	UU	
TAT	S	Since Ringback does not cause a new termination, the Termination_Attempt trigger would not be encountered during Ringback.
TRA	UU	Because Ringback does not cause a new termination, trigger TRA is not encountered during Ringback.
TKTERM	N/A	E911 ringback is supported over incoming E911 and E911 VFGs. Therefore, there are no interactions.

24.10.5.2 Event interactions with E911 ringback

Table 455 provides event interactions with E911 ringback.

Table 455 Event interactions with E911 ringback

Event	Status	Interactions
Network_Busy	UU	Not applicable
O_Answer	UU	
O_CPB	UU	
O_CPB	UU	
O_NoA	UU	
T_Answer	UU	
T_Busy	UU	
T_NoA	UU	

24.11 Feature groups

This section includes the following features:

- feature group A (FGA)
- feature group B (FGB)
- feature group C (FGC)
- feature group D (FGD)

Note: Calls that return parameter CalledPartyID with the nature of number field set to "950+ Call" are treated as 950 calls and are considered InterLATA calls that can route either as FGB or FGD, to a carrier. AIN calls that route either as FGB, FGC, or FGD through MF trunks, outpulse an ANI spill based on parameters ChargeNumber and ChargePartyStationType returned in an AIN response.

24.11.1 FGA

Feature group A (FGA) provides line-side access from an end office switch to an interexchange carrier (IEC) toll network. The FGA carrier uses conventional signaling and is billed by the LEC on a flat rate basis for local access or leased facilities.

24.11.1.1 Trigger interactions with FGA

Table 456 provides trigger interactions with FGA.

Table 456 Trigger interactions with FGA

Trigger	Status	Interactions
AFR	S	AIN calls can be routed using the FGA dial plan. These calls can encounter AIN triggers.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	Calls routed using and FGA dial plan can encounter trigger TRA.
TRKTERM	S	

24.11.1.2 Event interactions with FGA

Table 457 provides event interactions with FGA.

Table 457 Event interactions with FGA

Event	Status	Interactions
Network_Busy	S	AIN calls can be routed using the FGA dial plan. These calls can arm/detect AIN events.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.11.1.3 Other interactions with FGA

Table 458 provides other interactions with FGA.

Table 458 Other interactions with FGA

Description	Status	Interactions
parameter CarrierUsage	S	FGA supports parameter CarrierUsage.

24.11.2 FGB

FGB is a plan that provides FGB carriers with trunk-side interconnections to the operating company network in an FGB area. An FGB area is a member of a set of non-overlapping regions jointly covering the areas served by the operating company. FGB areas are related to LATAs. An FGB area is based on a collection of areas served by designated numbering plan areas (NPA) and is a subset of a LATA.

FGB allows a subscriber to access a carrier by dialing 1950-XXXX

24.11.2.1 Trigger interactions with FGB

Table 459 provides trigger interactions with FGB.

Table 459 Trigger interactions with FGB

Trigger	Status	Interactions
AFR	S	FGB calls can encounter any applicable trigger after the InfoCollected TDP.
CDP	S	FGB calls can encounter any applicable trigger after the InfoCollected TDP. For triggers at the InfoAnalyzed TDP, the NPA of the line attribute of the originating agent is used as part of the digit criteria.
International	S	
N11	S	
O_CPB	S	FGB calls can encounter any applicable trigger after the InfoCollected TDP.
O_NoA	S	
OHD	S	Calls that encounter these triggers can encounter FGB later.
OHI	S	
One_Plus_Prefix	S	FGB calls can encounter any applicable trigger after the InfoCollected TDP. For triggers at the InfoAnalyzed TDP, the NPA of the line attribute of the originating agent is used as part of the digit criteria.
Operator_Services	S	
PFC	S	
PRIB	S	Calls that encounter this trigger can encounter FGB later.
SDS	S	FGB calls can encounter any applicable trigger after the InfoCollected TDP. For triggers at the InfoAnalyzed TDP, the NPA of the line attribute of the originating agent is used as part of the digit criteria.
SFC	S	
SIT	S	Calls that encounter this trigger can encounter FGB later.
Specified_Carrier	S	FGB calls can encounter any applicable trigger after the InfoCollected TDP. For triggers at the InfoAnalyzed TDP, the NPA of the line attribute of the originating agent is used as part of the digit criteria.
T_Busy	S	FGB calls can encounter any applicable trigger after the InfoCollected TDP.
T_NoA	S	
TAT	S	
TRA	S	Calls routed using an FGB dial plan can encounter trigger TRA.
TRKTERM	S	

24.11.2.2 Event interactions with FGB

Table 460 provides event interactions with FGB.

Table 460 Event interactions with FGB

Event	Status	Interactions
Network_Busy	S	FGB calls can arm/detect all events.
O_Answer	S	
O_CPB	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.11.2.3 Other interactions with FGB

Table 461 provides other interactions with FGB.

Table 461 Other interactions with FGB

Description	Status	Interactions
Forward Call	S	Calls can receive a Forward Call response to an FGB carrier. Once triggering has taken place, the call is no longer considered a FGB call.
Analyze Route	S	Other non-FGB calls that trigger can receive an Analyze Route response with CalledPartyId of 950XXXX. This causes the call to be routed to the FGB carrier and, as such, it is now considered an FGB call.
CalledPartyID	S	Calls that return a CalledPartyID parameter with the Nature of Number field set to “950+ Call” are translated and proceed through the regular equal access outpulsers as an FGB call to the specified (interim) interexchange carrier (IEC). The call from this point is considered a FGB call and is routed according to FGB EA translations. Any FGB billing records (for example, FGB Origination Billing - call code 134) are generated for the call.
Create_Call	S	A call established through the Create_Call functionality can route as FGB.

Table 461 Other interactions with FGB (Continued)

Description	Status	Interactions
ChargePartyStationType	S	AIN calls that route as FGB, through MF trunks, outpulse an ANI spill based on parameters ChargeNumber and ChargePartyStationType returned in an AIN response.
ChargeNumber	S	
parameter CarrierUsage	S	When the call is a 950-XXXX call, the SSP ignores parameter CarrierUsage received in a response message.

24.11.3 FGC

Outgoing FGC carries equal access calls to a specific carrier using conventional (pre-divestiture) signaling.

24.11.3.1 Trigger interactions with FGC

Table 462 provides trigger interactions with FGC.

Table 462 Trigger interactions with FGC

Trigger	Status	Interactions
AFR	PS	AIN calls can be routed using the FGC dial plan. These calls can encounter AIN triggers. There are some restrictions; see North American DMS-100 translations guide, for details.
CDP	PS	
International	PS	
N11	PS	
O_CPB	PS	
O_NoA	PS	
OHD	PS	
OHI	PS	
One_Plus_Prefix	PS	
Operator_Services	PS	
PFC	PS	
PRIB	PS	
SDS	PS	
SFC	PS	
SIT	PS	
Specified_Carrier	PS	
T_Busy	PS	
T_NoA	PS	
TAT	PS	
TRA	PS	Calls routed using an FGC dial plan can encounter trigger TRA. Some restrictions apply; see North American DMS-100 translations guide.
TKTERM	S	

24.11.3.2 Event interactions with Feature group C

Table 463 provides event interactions with Feature group C.

Table 463 Event interactions with Feature group C

Event	Status	Interactions
Network_Busy	PS	AIN Service Enablers calls can be routed using the FGC dial plan. These calls can arm/detect AIN events. There are some restrictions. See the North American DMS-100 translations guide for details.
O_Answer	PS	
O_CPB	PS	
O_CPB	PS	
O_NoA	PS	
T_Answer	PS	
T_Busy	PS	
T_NoA	PS	

24.11.3.3 Other interactions with FGC

Table 464 provides other interactions with FGC

Table 464 Other interactions with FGC

Description	Status	Interactions
ChargePartyStationType	S	AIN calls that route either as FGB, FGC, or FGD through MF trunks, outpulse an ANI spill based on parameters ChargeNumber and ChargePartyStationType returned in an AIN response.
ChargeNumber	S	
Create_Call	S	A call established through the Create_Call functionality can route as FGC.
parameter CarrierUsage	S	No interaction because CarrierUsage does not change Feature group C signaling.

24.11.4 FGD

Outgoing FGD signalling is also known as EAPLAN. It is used to signal equal access subscriber calls from TOPS to a carrier office.

FGD can have either two stages for national signaling, or three stages for international signaling.

24.11.4.1 Trigger interactions with FGD

Table 465 provides trigger interactions with FGD.

Table 465 Trigger interactions with FGD

Trigger	Status	Interactions
AFR	PS	AIN Service Enablers calls can be routed using the FGD dial plan. These calls can encounter AIN triggers. There are some restrictions; see NA DMS-100 Translations Guide, for details.
CDP	PS	
International	PS	
N11	PS	
O_CPB	PS	
O_NoA	PS	
OHD	PS	
OHI	PS	
One_Plus_Prefix	PS	
Operator_Services	PS	
PFC	PS	
PRIB	PS	
SDS	PS	
SFC	PS	
SIT	PS	
Specified_Carrier	PS	
T_Busy	PS	
T_NoA	PS	
TAT	PS	
TRA	PS	Calls routed using an FGD dial plan can encounter trigger TRA. Some restrictions apply; see North American DMS-100 translations guide.
TKTERM	S	

24.11.4.2 Event interactions with FGD

Table 466 provides event interactions with FGD.

Table 466 Event interactions with FGD

Event	Status	Interactions
Network_Busy	PS	AIN Service Enablers calls can be routed using the FGD dial plan. These calls can arm/detect AIN events. There are some restrictions, see NA DMS-100 Translations Guide for details.
O_Answer	PS	
O_CPB	PS	
O_CPB	PS	
O_NoA	PS	
T_Answer	PS	
T_Busy	PS	
T_NoA	PS	

24.11.4.3 Other interactions with FGD

Table 467 provides other interactions with FGD.

Table 467 Other interactions with FGD

Description	Status	Interactions
Analyze Route	S	For an Analyze Route containing a Primary Carrier parameter (other than “0110”), the originating POTS line or trunk must have a valid line or trunk attribute in order to complete equal access calls to that carrier. The same restriction applies in absence of AIN for that POTS line or trunk initiating a FGD equal access call to the same carrier. Calls originating on a POTS trunk that encounter an AIN trigger and receive a Primary Carrier parameter in a response message is sent to a treatment, when the originating POTS trunk is not using FGD signaling.
Primary Carrier	S	
CalledPartyID	S	Calls that return a CalledPartyID parameter with the Nature of Number field set to “950+ Call” are translated and proceed through the regular equal access outpulsers as a FGD call to the specified (transitional) IEC. The call from this point is considered a FGD call and is routed according to FGD EA translations.
ChargePartyStationType	S	AIN calls that route as FGD through MF trunks, outpulse an ANI spill based on parameters ChargeNumber and ChargePartyStationType returned in an AIN response.
ChargeNumber	S	

Table 467 Other interactions with FGD (Continued)

Description	Status	Interactions
Create_Call	S	A call established through the Create_Call functionality can route as FGD.
parameter CarrierUsage	S	No interaction because CarrierUsage does not change Feature group D signaling.

24.12 Flash ignore

When flash ignore (FIG) is enabled on a line, flashes from the handset are ignored.

24.12.1 Trigger interactions with FIG

Table 468 provides trigger interactions with FIG.

Table 468 Trigger interactions with FIG

Trigger	Status	Interactions
AFR	S	All triggers are supported for calls originating /terminating to a line with FIG. AIN does not affect the functionality of FIG.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	TRA trigger can be encountered for calls originating or terminating to a line with FIG. Trigger TRA does not affect the functionality of FIG. AIN does not affect the functionality of FIG.
TKTERM	N/A	

24.12.2 Event interactions with FIG

Table 469 provides event interactions with FIG.

Table 469 Event interactions with FIG

Event	Status	Interactions
Network_Busy	S	All events are supported for calls originating /terminating to a line with FIG. AIN does not affect the functionality of FIG.
O_Answer	S	
O_CPB	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.13 Hold features

This section addresses the following hold features:

- call hold (CHD)
- key set music on hold (KSMOH)

24.13.1 Call hold

Call hold CHD is activated by flashing and dialing an access code.

24.13.1.1 Trigger interactions with CHD

Table 470 provides trigger interactions with CHD.

Table 470 Trigger interactions with CHD

Trigger	Status	Interactions
AFR	S	The CHD feature is activated before the Info_Collected PIC, therefore, these triggers are not hit when placing a call on hold, or when retrieving a call from hold.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	OHI takes precedence over CHD. The CHD will not be encountered after OHI. When OHI is hit, subsequent AIN triggers and events can be hit and detected.
One_Plus_Prefix	S	The CHD feature is activated before the Info_Collected PIC, therefore, these triggers are not hit when placing a call on hold, or when retrieving a call from hold.
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	CHD is activated before the Info_Collected PIC; therefore, trigger TRA is not hit when placing a call on hold, nor when retrieving a call from hold.
TKTERM	N/A	

24.13.1.2 Event interactions with CHD

Table 471 provides event interactions with CHD.

Table 471 Event interactions with CHD

Event	Status	Interactions
Network_Busy	S	AIN events and Call Hold do not interact. When a party is placed on hold, and retrieved from hold, no AIN triggers are hit and no events can be armed.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	
O_Disconnect	PS	When an agent is already a CPH controller and it tries to put that call on hold, FNAL treatment is given. A Call can be put on hold only when the AIN controller and the CHD feature controller are different. If a CHD controller tries to arm an O_Disconnect event, AINF treatment will be given. CPH events can be armed only in one leg of the CHD call.
O_Disconnect_Called	PS	When an agent is already a CPH controller and it tries to put that call on hold, FNAL treatment is given. A Call can be put on hold only when the AIN controller and the CHD feature controller are different. If a CHD controller tries to arm an O_Disconnect_Called event, AINF treatment will be given. CPH events can be armed only in one leg of the CHD call.
Timeout	PS	When an agent is already a CPH controller and it tries to put that call on hold, FNAL treatment is given. A Call can be put on hold only when the AIN controller and the CHD feature controller are different. If a CHD controller tries to arm a Timeout event, AINF treatment will be given. CPH events can be armed only in one leg of the CHD call.

24.13.1.3 Other interactions with CHD

Table 472 provides other interactions with CHD.

Table 472 Other interactions with CHD

Description	Status	Interactions
Collect_Information	S	When processing parameter CollectedDigits in a Collect_Information message, the CHD feature can activate.
Create_Call	S	When the originator has CHD active, the call is considered interface busy. The originator does not receive alerting.

24.13.2 Key set music on hold

The key set music on hold (KSMOH) feature allows a party placed on hold by a business set user to be connected to an audio source such as music. Audio sources are defined by the operating company in table AUDIO. When the business set user takes the call off of hold, the call is reestablished on the DN line.

24.13.2.1 Trigger interactions with KSMOH

Table 473 provides trigger interactions with KSMOH

Table 473 Trigger interactions with KSMOH

Trigger	Status	Interactions
AFR	S	AIN triggers and KSMOH do not interact. When a party is placed on hold, and retrieved from hold, no AIN triggers are hit.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	Trigger TRA and KSMOH do not interact. When a party is placed on hold and retrieved from hold, trigger TRA is not hit.
TKTERM	N/A	

24.13.2.2 Event interactions with KSMOH

Table 474 provides event interactions with KSMOH

Table 474 Event interactions with Key set music on hold

Event	Status	Interactions
Network_Busy	S	AIN events and KSMOH do not interact. When a party is placed on hold, and retrieved from hold, no AIN triggers are hit.Therefore no events can be armed.
O_Answer	S	
O_CPB	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.13.2.3 Other interactions with KSMOH

Table 474 provides other interactions with KSMOH

Table 475 Other interactions with Key set music on hold

Description	Status	Interactions
Create_Call	S	When the originator has KSMOH active, the call is considered interface busy. The originator does not receive alerting.

24.14 Hotline features

This section addresses the following hotline features:

- automatic dialing (AUD)
- automatic line (AUL)
- custom IBN disconnect treatment (CDT)
- manual line (MAN)

24.14.1 Automatic dialing

The automatic dialing (AUD) feature allows an MBS station user to call a frequently dialed number by pressing the assigned feature key.

24.14.1.1 Trigger interactions with AUD

Table 476 provides trigger interactions with AUD.

Table 476 Trigger interactions with AUD

Trigger	Status	Interactions
AFR	S	These triggers can be hit when calls are made using the AUD key.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	This trigger is not hit when calls are made using the AUD key.
One_Plus_Prefix	S	These triggers can be hit when calls are made using the AUD key.
Operator_Services	S	
PFC	S	
PRIB	NA	AUD is not supported for PRI agents.
SDS	S	This trigger can be hit when calls are made using the AUD key.
SFC	PS	This feature can have an SFC access code datafilled as the number to dial. The SFC trigger can be encountered upon feature activation. This feature can behave differently depending on the digit collection method. The SFC VSC or FAC is stored as the DN in memory in most cases with the digit collection set to IMMED. When other digit collection methods (that is, NORM, FIXED, VAR) are used, a second dial tone is provided prompting the caller for additional digits. Any digits stored in memory in addition to VSC or FAC are ignored. It is recommended that only the SFC access code be stored in memory and not the second string of digits.
SIT	NA	AUD is not supported on trunk agents.
Specified_Carrier	S	This trigger can be hit when calls are made using the AUD key.

Table 476 Trigger interactions with AUD (Continued)

Trigger	Status	Interactions
T_Busy	S	Calls made with the AUD feature that terminate on agents subscribed to the terminating triggers behave properly. The trigger is hit and the calls route as specified.
T_NoA	S	
TAT	S	
TRA	S	The SSP allows a call made using AUD to encounter trigger TRA.
TKTERM	N/A	

24.14.1.2 Event interactions with AUD

Table 477 provides event interactions with AUD.

Table 477 Event interactions with AUD

Event	Status	Interactions
Network_Busy	S	All events can be armed/detected when calls are made using the AUD key.
O_Answer	S	
O_CPB	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.14.1.3 Other interactions with AUD

Table 478 provides other interactions with AUD.

Table 478 Other interactions with AUD

Description	Status	Interactions
SendToResource	PS	The AUD key is ignored when connected to an IP. The AUD key cannot be used to enter digits when the call is connected to an IP.
SCP Responses	PS	The AUD key is ignored while waiting for an SCP response.

24.14.2 Automatic line

The digits datafilled as the AUL_DN against a directory number (DN) are substituted for the dialed digits. The call proceeds normally.

24.14.2.1 Trigger interactions with AUL

Table 479 provides trigger interactions with AUL.

Table 479 Trigger interactions with AUL

Trigger	Status	Interactions
AFR	S	Calls placed to and from an AUL line can hit these triggers.
CDP	S	
International	UU	Not applicable
N11	S	Calls placed to and from an AUL line can hit these triggers.
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	When the AUL subscriber subscribes to this trigger, the call hits this trigger. The call does not encounter the AUL feature.
One_Plus_Prefix	UU	Not applicable
Operator_Services	UU	Not applicable
PFC	S	Calls placed to and from an AUL line can hit these triggers.
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	UU	Not applicable
T_Busy	S	Calls placed to and from an AUL line can hit these triggers.
T_NoA	S	
TAT	S	

Table 479 Trigger interactions with AUL (Continued)

Trigger	Status	Interactions
TRA	S	The SSP allows a call made using AUL to encounter trigger TRA.
TKTERM	N/A	

24.14.2.2 Event interactions with AUL

Table 480 provides event interactions with AUL.

Table 480 Event interactions with AUL

Event	Status	Interactions
Network_Busy	S	Calls placed to and from an AUL line can arm and detect these events.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.14.2.3 Other interactions with AUL

Table 480 provides other interactions with AUL.

Table 481 Other interactions with AUL

Description	Status	Interactions
Create_Call	S	When the originator has AUL, the Create_Call request is rejected by sending the SCP a failure message with failureCause=inappropriateUserInterface.

24.14.3 Custom IBN disconnect treatment

The custom IBN disconnect treatment (CDT) feature allows the operating company to assign a DISConnect treatment to a MDC line on an individual DN basis.

24.14.3.1 Trigger interactions with CDT

Table 482 provides trigger interactions with CDT.

Table 482 Trigger interactions with CDT

Trigger	Status	Interactions
AFR	S	Calls that encounter these triggers can encounter CDT.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	
T_NoA	S	
TAT	S	
TRA	S	The SSP allows a line involved in a call encountering the trigger TRA to route to CDT treatment upon disconnect.
TKTERM	N/A	

24.14.3.2 Event interactions with CDT

Table 483 provides event interactions with CDT.

Table 483 Event interactions with CDT

Event	Status	Interactions
Network_Busy	S	Calls that arm/detect this event can encounter CDT.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.14.3.3 Other interactions with CDT

Table 484 provides other interactions with CDT.

Table 484 Other interactions with CDT

Description	Status	Interactions
DISConnect	S	Calls made from a line assigned the CDT option route to the assigned CDT treatment upon disconnect except calls that receive a DISConnect response from the SCP after triggering. These calls route to AIND treatment. This is the expected functionality.

24.14.4 Manual line

Manual line (MAN) is a line option that stands for manual service. It is similar to the AUL feature, except that the originator is always connected to the operator.

24.14.4.1 Trigger interactions with MAN

Table 485 provides trigger interactions with MAN.

Table 485 Trigger interactions with MAN

Trigger	Status	Interactions
AFR	PS	All originating and terminating triggers are ignored for calls originating from a line having the MAN option. No digits can be collected on such lines.
CDP	PS	
International	UU	Not applicable

Table 485 Trigger interactions with MAN (Continued)

Trigger	Status	Interactions
N11	PS	All originating and terminating triggers are ignored for calls originating from a line having the MAN option. No digits can be collected on such lines.
O_CPB	PS	
O_NoA	PS	
OHD	PS	
OHI	PS	
One_Plus_Prefix	UU	Not applicable
Operator_Services	UU	
PFC	PS	All originating and terminating triggers are ignored for calls originating from a line having the MAN option. No digits can be collected on such lines.
PRIB	NA	MAN is not supported on PRI agents.
SDS	S	All originating and terminating triggers are ignored for calls originating from a line having the MAN option. No digits can be collected on such lines.
SFC	S	
SIT	NA	MAN is not supported on trunk agents.
Specified_Carrier	UU	Not applicable
T_Busy	S	Calls terminating on a MAN line can hit these triggers.
T_NoA	S	
TAT	S	
TRA	S	The SSP allows calls terminating on a MAN line to encounter trigger TRA. Because calls originating from a Manual line terminate on an Operator and Operator (in our case Attendant Console) is not supported for trigger TRA, trigger TRA is not encountered.
TKTERM	N/A	

24.14.4.2 Event interactions with MAN

Table 486 provides event interactions with MAN follow.

Table 486 Event interactions with MAN line

Event	Status	Interactions
Network_Busy	S	Since no triggers can be hit, no events can be armed or detected.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.14.4.3 Other interactions with MAN

Table 487 provides other interactions with MAN.

Table 487 Other interactions with MAN

Description	Status	Interactions
Forward call	S	Calls can be forwarded from a MAN line.
Create_Call	S	When the originator has MAN, the Create_Call request is rejected by sending the SCP a failure message with failureCause=inappropriateUserInterface.

24.15 Hunt groups

This section describes interactions with hunt group features. See Table 180 “DMS-100 features” on page 720 for a complete list of hunt group features.

24.15.1 Bridged night number

The bridged night number (BNN) option allows a subscriber to advertise a different number for night service without requiring a third wire to the premises. A BNN is assigned to a phone that is already assigned within a hunt group. The hunt group works as normal, and has an alternate phone number assigned to one of its member that can be called without hunting through the group.

Other types of hunt groups can be used with a BNN, but Distributed Line Hunt (DLH) is the preferred choice. In a DLH there is only one DN associated with the hunt group, the pilot DN. Hunting starts after the first idle line found by the previous hunt and continues until the starting point of the hunt is reached.

When no idle line is found, the call either routes to a busy tone or an overflow route (when defined). This method of hunting evenly distributes all the calls over the hunt group. DLH works as normal. When the BNN is called, no hunting occurs.

24.15.1.1 Trigger interactions with BNN

Table 488 provides trigger interactions with BNN.

Table 488 Trigger interactions with BNN

Trigger	Status	Interactions
AFR	UU	Not applicable
CDP	UU	
International	UU	
N11	UU	
O_CPB	UU	
O_NoA	UU	
OHD	S	These triggers can be hit from a BNN DN
OHI	S	
One_Plus_Prefix	UU	Not applicable
Operator_Services	UU	
PFC	UU	
PRIB	UU	
SDS	S	This trigger can be hit from a BNN DN
SFC	UU	Not applicable
SIT	UU	
Specified_Carrier	UU	
T_Busy	S	These triggers are encountered when terminating on an established BNN as described in the Table 490 “Other interactions with BNN” on page 1046.
T_NoA	S	
TAT	S	

Table 488 Trigger interactions with BNN (Continued)

Trigger	Status	Interactions
TRA	S	For the pilot DN of a BNN Hunt Group, the SSP can encounter trigger TRA when one or more hunt terminals within the BNN group are available. Trigger TRA AINDN option is available for subscription by the pilot of a BNN hunt group established as an overlay to other hunt group types. The AINDN option is disallowed from BNNs that are added from hunt groups where the base agent type is an electronic business set (EBS) and the error message “Could not read IBNLINES or LENLINES” is displayed.
TKTERM	N/A	

24.15.1.2 Event interactions with BNN

Table 489 provides event interactions with BNN.

Table 489 Event interactions with BNN

Event	Status	Interactions
Network_Busy	S	These events are detected on a BNN DN.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.15.1.3 Other interactions with BNN

Table 490 provides other interactions with BNN.

Table 490 Other interactions with BNN

Description	Status	Interactions
SERVORD	PS	The AINDN option can be assigned to the pilot of a BNN hunt group established as an overlay to other hunt group types. These options cannot be assigned to a BNN that is added as only an option to other hunt group types. When a BNN is created using the establish (EST) command in SERVORD, the AINDN option can be added the DN as normal. When the BNN is created using the ABNN (Add BNN) command in SERVORD, the addition of the AINDN is disallowed by SERVORD with an appropriate error message. The AINDN options are also disallowed from BNNs that are added (using either method above) from hunt groups where the base agent type is an electronic business set (EBS). The message “Could not read IBNLINES or LENLINES” is issued when the AIN or AINDN option is added using command ADO. The TAT trigger is distinguished from any AIN option that can be applicable to the base hunt group type of the BNN.
DisplayText	S	AIN DisplayText can be seen on a BNN DN.
Create_Call	S	When the CalledPartyID in the Create_Call message corresponds to the BNN, the call terminates on the BNN. When the CallingPartyID in the Create_Call message corresponds to the BNN, the BNN is alerted.

24.15.2 Directory number hunt

For directory number (DN) hunting, each directory number hunt (DNH) group has its own unique DN. The hunt group can be accessed by dialing any DN in the hunt group, but the number of lines hunted depends on the hunting arrangements (that is, circular or sequential) assigned to the DNH group directory number hunt group.

Circular hunting hunts all lines in the hunt group regardless of the starting point, whereas sequential hunting starts at the number dialed and ends at the last number in the hunt group.

24.15.2.1 Trigger interactions with DNH

Table 491 provides trigger interactions with DNH.

Table 491 Trigger interactions with DNH

Trigger	Status	Interactions
AFR	S	Calls that hit these triggers can terminate on a hunt group.
CDP	S	
International	S	
N11	S	
O_CPB	S	The O_CPB trigger is hit when all members of the hunt group are busy and there is no LOD/LOR.
O_NoA	S	The O_NoA trigger is hit when all members of the hunt group do not answer.
OHD	S	Calls that hit these triggers can terminate on a hunt group.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	PS	The information provided in this section refers to scenarios where the primary DN of the Hunt Group subscribes to trigger T_Busy. However, a call does not hit trigger T_Busy when a user dials a primary DN that does not subscribe to trigger T_Busy even when the call goes to another DN (of the hunt group) that subscribes to trigger T_Busy. The trigger is hit only when that DN is called directly. Trigger T_Busy is encountered on a call when all members of the hunt group are busy and there is no LOD or LOR option for the group.

Table 491 Trigger interactions with DNH (Continued)

Trigger	Status	Interactions
T_NoA	PS	The information provided in this section refers to scenarios where the primary DN of the Hunt Group subscribes to the T_NoAnswer trigger. However, a call does not hit the T_NoAnswer trigger when a user dials a primary DN that does not subscribe to the T_NoAnswer trigger even when the call goes to another DN (of the hunt group) that subscribes to the T_NoAnswer trigger. This trigger is hit only when that DN is called directly. When the call is directed to a member of the hunt group (either the pilot or any member) that is idle, the T_No_Answer query message is sent to the SCP once the T_No_Answer timer expires. When a T_NoAnswer query is generated, the USERID parameter is populated with the primary DN.
TAT	S	TAT takes precedence over this feature. However, when the SCP returns an Authorize_Termination response message, the call terminates to the hunt group.
TRA	S	For the primary DN or a member DN of a DN hunt group (called) that is subscribed to trigger TRA, the SSP can encounter the trigger TRA when one or more hunt terminals within the group are available.
TKTERM	N/A	

24.15.2.2 Event interactions with DNH

Table 492 provides event interactions with DNH.

Table 492 Event interactions with DNH

Event	Status	Interactions
Network_Busy	S	This event can be encountered and the call can be routed to a DNH group.
O_Answer	S	This event is encountered when a hunt group member answers.
O_CPB	S	For hunt groups without LOD/LOR, this event is detected when all members of the hunt group are busy.
O_NoA	S	This event is encountered when a hunt group member does not answer.
T_Answer	S	This event is detected when a hunt group member answers.

Table 492 Event interactions with DNH

Event	Status	Interactions
T_Busy	S	For hunt groups without LOD/LOR, this event is encountered when all members of the hunt group are busy.
T_NoA	S	This event is encountered when a hunt group member does not answer.

24.15.2.3 Other interactions with DNH

Table 493 provides other interactions with DNH.

Table 493 Other interactions with DNH.

Description	Status	Interactions
Collect_Information	S	When the CollectedDigits parameter contains digits that correspond to a hunt group, then the call will terminate on the hunt group.
Update message	S	When a request is received for 'Change Status of MWI' on a DNH Agent then Indication is provided to the station identified by the SSPUserresourceID parameter.
Offer_Call	PS	When the SSP receives an Offer_Call response to a T_Busy query, the call is offered when CWT and T_Busy are subscribed to the same member.
Create_Call	S	When the CallingPartyID in the Create_Call message corresponds to the hunt group pilot DN, the pilot DN is alerted. When the CalledPartyID in the Create_Call message corresponds to this hunt group, the call terminates on the first available member of the hunt group.

24.15.3 Distributed line hunt

The distributed line hunt (DLH) feature is a hunting arrangement that consists of lines divided into groups. This allows for distributed line hunting. There is only a pilot DN associated with the hunt group and the hunt is sequential over all groups until a line in an available group is selected. Hunting starts after the first idle line found by the previous hunt and continues until the starting point of the hunt is reached. At this point, busy tone is returned, unless options LOD or LOR are assigned to the hunt group. DLH is assigned to groups requiring an equal distribution of calls.

24.15.3.1 Trigger interactions with DLH

Table 494 provides trigger interactions with DLH.

Table 494 Trigger interactions with DLH

Trigger	Status	Interactions
AFR	S	Any call that hits these triggers can terminate to a DLH.
CDP	S	
International	S	
N11	S	
O_CPB	S	The O_CPB trigger is hit when all members of the hunt group are busy and there is no LOD/LOR.
O_NoA	S	The O_NoA trigger is hit when all members of the hunt group do not answer.
OHD	S	Any call that hits these triggers can terminate to a DLH.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	S	The T_Busy trigger is hit when all members of the hunt group are busy and there is no LOD/LOR.
T_NoA	S	The T_NoA trigger is hit when all members of the hunt group do not answer.
TAT	S	Any call that hits this trigger can terminate to a DLH.
TRA	S	For the pilot DN of a DLH Hunt Group, the SSP can encounter trigger TRA when one or more hunt terminals within the group are available.
TKTERM	N/A	

24.15.3.2 Event interactions with DLH

Table 495 provides event interactions with DLH.

Table 495 Event interactions with DLH

Event	Status	Interactions
Network_Busy	S	This event can be detected when the call terminates to a DLH.
O_Answer	S	This event is encountered when a hunt group member answers.
O_CPB	S	For hunt groups without LOD/LOR, this event is detected when all members of the hunt group are busy.
O_NoA	S	This event is encountered when a hunt group member does not answer.
T_Answer	S	This event is encountered when a hunt group member answers.
T_Busy	S	For hunt groups without LOD/LOR, this event is encountered when all members of the hunt group are busy.
T_NoA	S	This event is encountered when a hunt group member does not answer.

24.15.3.3 Other interactions with DLH

Table 496 provides other interactions with DLH.

Table 496 Other interactions with DLH

Description	Status	Interactions
Update message	S	Only a Pilot DN is associated with this hunt group. The difference between MLH and DLH is that Hunting is sequential starting from Pilot DN in the case of MLH while in DLH the Hunting starts with first Idle line. For DLH only the Pilot DN is given Message waiting Indication on the receipt of a request for 'Change Status of MWI'.
Offer_Call	S	Since CWT can not be subscribed to a DLH hunt group, the parameter, BusyType in the T_Busy query is populated with 'CallCannotBeOffered'.Therefore DLH and Offer_Call have no interaction.

Table 496 Other interactions with DLH (Continued)

Description	Status	Interactions
Collect_Information	S	When the CollectedDigits parameter contains digits that correspond to a Hunt group, then the call will terminate on the hunt group.
Create_Call	S	When the CallingPartyID in the Create_Call message corresponds to the hunt group pilot DN, the pilot DN is alerted. When the CalledPartyID in the Create_Call message corresponds to this Hunt Group, then the call is terminated on the first available member of the Hunt Group.

24.15.4 Key-set short hunt

Key-set users can subscribe to the key-set short hunt (KSH) feature. This feature allows for calls to hunt from one DN to another on the same set.

If SOC option AIN00310 is OFF, or value of office parameter REDIRECTION_FRAMEWORK is N, the redirection information is not tracked in any AIN occurrence after KSH. In an AIN query after KSH, the redirection information can be incorrect.

If SOC option AIN00310 is ON and value of office parameter REDIRECTION_FRAMEWORK is Y, the redirection information is tracked in AIN occurrence after KSH. In an AIN query after KSH, the redirection information will be correct.

24.15.4.1 Trigger interactions with KSH

Table 497 provides trigger interactions with KSH.

Table 497 Trigger interactions with KSH

Trigger	Status	Interactions
AFR	PS	These triggers cannot be hit when the call is redirected by the KSH feature.
CDP	PS	
International	PS	
N11	PS	
O_CPB	UU	Not applicable

Table 497 Trigger interactions with KSH (Continued)

Trigger	Status	Interactions
O_NoA	PS	These triggers cannot be hit when the call is redirected by the KSH feature.
OHD	PS	
OHI	PS	
One_Plus_Prefix	PS	
Operator_Services	PS	
PFC	PS	
PRIB	NA	KSH is not supported on PRI agents.
SDS	PS	These triggers cannot be hit when the call is redirected by the KSH feature.
SFC	PS	
SIT	NA	KSH is not supported on trunk agents.
Specified_Carrier	PS	This trigger cannot be hit when the call is redirected by the KSH feature.
T_Busy	PS	The information provided in this section refers to scenarios where the primary DN of the hunt group subscribes to the T_Busy trigger. However, a call does not hit the T_Busy trigger when a user dials a primary DN that does not subscribe to the T_Busy trigger even when the call goes to another DN (of the hunt group) that subscribes to the T_Busy trigger. The trigger is hit only when that DN is called directly. Trigger T_Busy is encountered on a call when all members of the hunt group are busy and there is no LOD or LOR option for the group.

Table 497 Trigger interactions with KSH (Continued)

Trigger	Status	Interactions
T_NoA	PS	The information provided in this section refers to scenarios where the primary DN of the Hunt Group subscribes to the T_NoAnswer trigger. However, a call does not hit the T_NoAnswer trigger when a user dials a primary DN that does not subscribe to the T_NoAnswer trigger even when the call goes to another DN (of the hunt group) that subscribes to the T_NoAnswer trigger. This trigger is hit only when that DN is called directly. When the call is directed to a member of the hunt group (either the pilot or any member) that is idle, the T_No_Answer query message is sent to the SCP once the T- TNoAnswer timer expires. When a T_NoAnswer TDP-R query is generated because of a KSH member, the USERID parameter is populated with the specific member's DN.
TAT	S	Trigger TAT takes precedence over this feature. However, when the SCP returns an Authorize_Termination response message, the call terminates to the hunt group.
TRA	S	For the primary DN or a member DN of a KSH group (called) that is subscribed to trigger TRA, the SSP can encounter the trigger TRA when one or more hunt terminals within the group are available. When a TRA TDP-R query is generated because of a KSH member, the USERID parameter is populated with the specific member's DN.
TKTERM	N/A	

24.15.4.2 Event interactions with KSH

Table 498 provides event interactions with KSH.

Table 498 Event interactions with KSH

Event	Status	Interactions
Network_Busy	S	This event can be detected on a call to a KSH.
O_Answer	S	This event is encountered when a hunt group member answers.
O_CPB	S	For hunt groups without LOD/LOR, this event is encountered when all members of the hunt group are busy.

Table 498 Event interactions with KSH (Continued)

Event	Status	Interactions
O_NoA	S	This event is encountered when a hunt group member does not answer.
T_Answer	S	This event is encountered when a hunt group member answers.
T_Busy	S	For hunt groups without LOD/LOR, this event is encountered when all members of the hunt group are busy.
T_NoA	S	This event is encountered when a hunt group member does not answer.

24.15.4.3 Other interactions with KSH

Table 499 provides other interactions with KSH.

Table 499 Other interactions with KSH

Description	Status	Interactions
Collect_Information	S	When the CollectedDigits parameter contains digits that correspond to a Hunt Group, then the call will terminate on the hunt group.
DisplayText	S	AIN DisplayText information is delivered to the first idle member in a hunt group.
Offer_Call	S	When the SSP receives an Offer_Call response to a T_Busy query, the call is offered when CWT/ACOU is subscribed to either the pilot or a member of the group.
Create_Call	S	When the CallingPartyID in the Create_Call message corresponds to a DN in the KSH group, the Create_Call request processes. When the originator is busy, no hunting is performed on the set. When the CalledPartyID in the Create_Call message corresponds to a DN in the KSH group, the call terminates on the first available DN.

Note: The redirection information is not tracked in any AIN occurrence after KSH. Hence the redirection information may not be correct in an AIN query after KSH.

24.15.5 Multiline hunt

With multiline hunt (MLH), only a pilot DN is associated with the hunt group, and hunting is done sequentially. Sequential hunting starts at the first line assigned to the pilot DN and ends at the last line.

24.15.5.1 Trigger interactions with MLH

Table 500 provides trigger interactions with MLH.

Table 500 Trigger interactions with MLH

Trigger	Status	Interactions
AFR	S	All calls that hit these triggers can terminate on an MLH.
CDP	S	
International	S	
N11	S	
O_CPB	S	The O_CPB trigger is hit when all members of the hunt group are busy and there is no LOD/LOR.
O_NoA	S	The O_NoA trigger is hit when all members of the hunt group do not answer.
OHD	S	All calls that hit these triggers can terminate on an MLH.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	PS	The information provided in this section refers to scenarios where the primary DN of the Hunt Group subscribes to the T_Busy trigger. However, a call does not hit the T_Busy trigger when a user dials a primary DN that does not subscribe to the T_Busy trigger even when the call goes to another DN (of the hunt group) that subscribes to the T_Busy trigger. The trigger is hit only when that DN is called directly. Trigger T_Busy is encountered on a call when all members of the hunt group are busy and there is no LOD/LOR option for the group.

Table 500 Trigger interactions with MLH

Trigger	Status	Interactions
T_NoA	PS	The information provided in this section refers to scenarios where the primary DN of the Hunt Group subscribes to the T_NoAnswer trigger. However, a call does not hit the T_NoAnswer trigger when a user dials a primary DN that does not subscribe to the T_NoAnswer trigger even when the call goes to another DN (of the hunt group) that subscribes to the T_NoAnswer trigger. This trigger is hit only when that DN is called directly. When the call is directed to a member of the hunt group (either the pilot or any member) that is idle, the T_No_Answer query message is sent to the SCP once the T_No_Answer timer expires. When a T_NoAnswer query is generated, the USERID parameter is populated with the primary DN.
TAT	S	TAT takes precedence over this feature. However, when the SCP returns an Authorize_Termination response message, the call terminates to the hunt group.
TRA	S	For the pilot DN of a MLH Hunt Group, the SSP can encounter trigger TRA when one or more hunt terminals within the group are available.
TKTERM	N/A	

24.15.5.2 Event interactions with MLH

Table 501 provides event interactions with MLH.

Table 501 Event interactions with MLH

Event	Status	Interactions
Network_Busy	S	This event can be detected on a call to an MLH.
O_Answer	S	This event is encountered when a hunt group member answers.
O_CPB	S	For hunt groups without LOD/LOR, this event is detected when all members of the hunt group are busy.
O_NoA	S	This event is encountered when a hunt group member does not answer.
T_Answer	S	This event is encountered when a hunt group member answers.

Table 501 Event interactions with MLH (Continued)

Event	Status	Interactions
T_Busy	S	For hunt groups without LOD/LOR, this event is encountered when all members of the hunt group are busy.
T_NoA	S	This event is encountered when a hunt group member does not answer.

24.15.5.3 Other interactions with MLH

Table 502 provides other interactions with MLH.

Table 502 Other interactions with MLH

Description	Status	Interactions
Collect_Information	S	When the CollectedDigits parameter contains digits that correspond to a Hunt group, then the call will terminate on the hunt group.
DisplayText	S	AIN DisplayText information is delivered to the first idle member in a hunt group.
Update_Message	S	Only a pilot DN is associated with the type of hunt group. For MLH only the Pilot DN is given Message waiting Indication on the receipt of a request for ‘Change Status of MWI’.
Create_Call	S	When the CallingPartyID in the Create_Call message corresponds to an MLH pilot DN, the Create_Call message processes. When the pilot DN is busy, no hunting is performed. If the CalledPartyID in the Create_Call message corresponds to the MLH group, the call terminates on the first available member of the hunt group.

24.15.6 Multiple position hunt

Multiple position hunt (MPH) allows calls to be distributed evenly across multiple non-data link attendant consoles. Calls are presented to the consoles in the order in which they arrive at the DMS-100 switch. Calls that cannot b presented to any console are queued until a console is available to serve that call.

A call is directed to a multiple hunting arrangement by associating a Directory Number (DN) with each call type in the console group.

24.15.6.1 Trigger interactions with MPH

Table 503 provides trigger interactions with MPH.

Table 503 Trigger interactions with MPH

Trigger	Status	Interactions
AFR	S	The AIN option can be assigned to MPH pilots and members. Trigger and response processing occurs correctly. AIN functionality on these lines is similar to functionality on IBM 2500 sets.
CDP	S	
International	S	
N11	S	
O_CPB	UU	Not applicable
O_NoA	UU	
OHD	S	The AIN option can be assigned to MPH pilots and members. Trigger and response processing occurs correctly. AIN functionality on these lines is similar to functionality on IBM 2500 sets.
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	UU	Not applicable
T_NoA	UU	
TAT	S	The AINDN options can be assigned to MPH pilots and members. The MPH queueing feature interacts properly with the TAT trigger. TAT is hit and processed properly prior to queuing the call to the MPH group. That is, the TAT trigger occurs first and has precedence over the MPH queuing feature.
TRA	UU	Not applicable
TKTERM	N/A	

24.15.6.2 Event interactions with MPH

Table 504 provides event interactions with MPH.

Table 504 Event interactions with MPH

Event	Status	Interactions
Network_Busy	S	This event can be detected on a call to an MPH.
O_Answer	S	This event is encountered when a hunt group member answers.
O_CPB	S	For hunt groups without LOD/LOR, this event is encountered when all members of the hunt group are busy.
O_NoA	S	This event is encountered when a hunt group member does not answer.
T_Answer	S	This event is encountered when a hunt group member answers.
T_Busy	S	For hunt groups without LOD/LOR, this event is encountered when all members of the hunt group are busy.
T_NoA	S	This event is encountered when a hunt group member does not answer.

24.15.6.3 Other interactions with MPH

Table 505 provides other interactions with MPH.

Table 505 Other interactions with MPH

Description	Status	Interactions
Collect_Information	S	When the CollectedDigits parameter contains digits that correspond to a Hunt group, then the call will terminate on the hunt group.
Offer_Call	S	When the SSP receives an offer-call response to a T_Busy query, the call is offered to the last member of the hunt group when CWT is subscribed by the hunt group.
Create_Call	S	When the CallingPartyID in the Create_Call message corresponds to the MPH pilot DN, the Create_Call message is rejected by sending the SCP a failure message with failureCause=inappropriateUserInterface. When the CalledPartyID in the Create_Call message corresponds to this hunt group, the call terminates on the first available member of the hunt group.

24.15.7 Night service directory number

The night service directory number (NSDN) option allows calls to be rerouted either to a predetermined directory number or to a busy signal when a scan point indicates that no console is attended.

24.15.7.1 Trigger interactions with NSDN

Table 506 provides trigger interactions with NSDN.

Table 506 Trigger interactions with NSDN

Trigger	Status	Interactions
AFR	S	These triggers can be hit on a call to an NSDN.
CDP	S	
International	S	
N11	S	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	UU	Not applicable
T_NoA	UU	
TAT	S	The TAT trigger occurs prior to the NSDN feature and has precedence over the NSDN feature. NSDN can be encountered after TAT.

Table 506 Trigger interactions with NSDN (Continued)

Trigger	Status	Interactions
TRA	UU	Not available
TKTERM	N/A	

24.15.7.2 Event interactions with NSDN

Table 507 provides event interactions with NSDN.

Table 507 Event interactions with night service directory number

Event	Status	Interactions
Network_Busy	S	This event is detected on calls to an NSDN.
O_Answer	S	This event is encountered when a hunt group member answers.
O_CPB	S	For hunt groups without LOD/LOR, this event is encountered when all members of the hunt group are busy.
O_NoA	S	This event is encountered when a hunt group member does not answer.
T_Answer	S	This event is encountered when a hunt group member answers.
T_Busy	S	For hunt groups without LOD/LOR, this event is encountered when all members of the hunt group are busy.
T_NoA	S	This event is encountered when a hunt group member does not answer.

24.15.7.3 Other interactions with NSDN

Table 505 provides other interactions with NSDN.

Table 508 Other interactions with NSDN

Description	Status	Interactions
Create_Call	S	When the CallingPartyID in the Create_Call message corresponds to the NSDN, the Create_Call message processes. When the CalledPartyID in the Create_Call message corresponds to the NSDN, the call terminates on the NSDN.

24.15.8 Stop hunt

Stop hunt (SHU) provides for a miscellaneous scan point circuit controlled by an external key.

24.15.8.1 Trigger interactions with SHU

Table 509 provides trigger interactions with SHU.

Table 509 Trigger interactions with SHU

Trigger	Status	Interactions
AFR	S	Not applicable
CDP	S	
International	S	
N11	S	
O_CPB	UU	
O_NoA	UU	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	UU	
T_NoA	UU	
TAT	S	The SHU feature interacts properly with the AIN TAT trigger. The TAT trigger is hit and processed properly prior to checking for and initiating the Stop Hunt feature. That is, the TAT trigger occurs prior to and has precedence over the SHU feature.
TRA	S	SHU takes precedence over trigger TRA. Trigger TRA cannot be encountered when the member of the hunt group has SHU activated, but can be encountered on other members of the hunt group when they are idle.
TKTERM	N/A	

24.15.8.2 Event interactions with SHU

Table 510 provides event interactions with SHU.

Table 510 Event interactions with SHU

Event	Status	Interactions
Network_Busy	UU	Not applicable
O_Answer	UU	
O_CPB	UU	
O_NoA	UU	
T_Answer	UU	
T_Busy	UU	
T_NoA	UU	

24.15.9 Terminating billing option - hunt groups

The terminating billing option - hunt groups (TRMBOPT) option allows an AMA record to be generated for each call that terminates on a member of a hunt group that has TRMBOPT assigned.

24.15.9.1 Trigger interactions with TRMBOPT

Table 511 provides trigger interactions with TRMBOPT.

Table 511 Trigger interactions with TRMBOPT

Trigger	Status	Interactions
AFR	S	Not applicable
CDP	S	
International	S	
N11	S	
O_CPB	UU	
O_NoA	UU	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	
T_Busy	UU	
T_NoA	UU	
TAT	S	The TRMBOPT feature interacts properly with the AIN TAT trigger. The TAT trigger is hit and processed properly on hunt group lines with the TRMBOPT option.
TRA	UU	Not Applicable
TKTERM	N/A	

24.15.9.2 Event interactions with TRMBOPT

Table 512 provides event interactions with TRMBOPT.

Table 512 Event interactions with TRMBOPT

Event	Status	Interactions
Network_Busy	S	All events can be armed and detected on calls to hunt groups with TRMBOPT.
O_Answer	S	
O_CPB	S	
O_NoA	S	
T_Answer	S	
T_Busy	S	
T_NoA	S	

24.15.9.3 Other interactions with TRMBOPT

Table 513 provides other interactions with TRMBOPT.

Table 513 Other interactions with TRMBOPT

Description	Status	Interactions
Billing	S	AMA call code 131 is produced when using the TRMBOPT option on hunt group lines with the AINDN option. AIN AMA is unaffected by the presence of the TRMBOPT option. Call Code 131 is merged into the AIN AMA record.

24.16 Hunt group overflow routing

This section addresses the following types of hunt group overflow routing:

- line overflow to directory number (LOD)
- line overflow to route (LOR)

When a call is unable to terminate to any member of a hunt group, because all members are busy, overflow routing can occur. The LOD feature causes a call to be forwarded to a specified DN when all members of a hunt group are busy. The LOR feature causes a call to be forwarded to a route when all members of a hunt group are busy.

24.16.1 Trigger interactions with LOD and LOR

Table 514 provides trigger interactions with LOD and LOR.

Table 514 Trigger interactions with LOD and LOR

Trigger	Status	Interactions
AFR	PS	Calls that encounter LOD or LOR do not encounter further originating triggers.
CDP	PS	
International	PS	
N11	PS	
O_CPB	S	
O_NoA	S	
OHD	S	
OHI	S	
One_Plus_Prefix	S	
Operator_Services	S	
PFC	S	
PRIB	S	
SDS	S	
SFC	S	
SIT	S	
Specified_Carrier	S	

Table 514 Trigger interactions with LOD and LOR (Continued)

Trigger	Status	Interactions
T_Busy	S	Trigger T_Busy is encountered when all members of the hunt group are busy. When the hunt group has the LOD/LOR option, trigger T_Busy is encountered when the overflow DN/overflow route is also busy and the overflow DN/overflow route subscribes to a T_Busy trigger group. If SOC option AIN00310 is OFF, or the value of office parameter REDIRECTION_FRAMEWORK in N, then AIN termination triggers are not encountered on an LOD call, if the originator's line or customer group is not subscribed to the AIN option and AIN office triggers are not enabled (AIN_OFFICE_TRIGGRP The AIN office TRIGGRP parameter is NIL in table OFCVAR) The redirection information is reflected in the query message for an LOD call, but not for an LOR call that encounters T_BUSY.
T_NoA	S	When the hunt group has the LOD/LOR option, when the overflow route leads to a DN which has subscribed to T_NoA trigger and does not answer, T_NoA is encountered. If SOC option AIN00310 is OFF, or the value of office parameter REDIRECTION_FRAMEWORK in N, then AIN termination triggers are not encountered on an LOD call, if the originator's line or customer group is not subscribed to the AIN option and AIN office triggers are not enabled (AIN_OFFICE_TRIGGRP The AIN office TRIGGRP parameter is NIL in table OFCVAR) The redirection information is reflected in the query message for an LOD call, but not for an LOR call that encounters T_NoA.
TAT	PS	Calls that encounter LOD or LOR can encounter TAT. When an LOD call subsequently encounters trigger Termination_Attempt, the redirection is reflected in the AIN query message. If SOC option AIN00310 is OFF, or the value of office parameter REDIRECTION_FRAMEWORK in N, then AIN termination triggers are not encountered on an LOD call, if the originator's line or customer group is not subscribed to the AIN option and AIN office triggers are not enabled (AIN_OFFICE_TRIGGRP The AIN office TRIGGRP parameter is NIL in table OFCVAR) The redirection information is reflected in the query message for an LOD call, but not for an LOR call that encounters TAT.

Table 514 Trigger interactions with LOD and LOR (Continued)

Trigger	Status	Interactions
TRA and LOD	S	When a hunt group has the LOD option, this trigger can be encountered when all members of the hunt group are busy and the overflow DN subscribing to trigger TRA is available. AIN termination triggers are not encountered on an LOD call when the originator's line or customer group is not subscribed to the AIN option and AIN office triggers are not enabled. (For AIN_OFFICE_TRIGGRP, this AIN office TRIGGRP parameter is NIL in table OFCVAR)
TRA and LOR	UU	Not applicable
TKTERM	N/A	Not applicable for LOD and for LOR

24.16.2 Event interactions with LOD and LOR

Table 515 provides event interactions with LOD and LOR.

Table 515 Event interactions with LOD and LOR

Event	Status	Interactions
Network_Busy	PS	For calls that involve the attendant console when hunt group overflow routing (LOD or LOR) occurs, any open NELs are closed and a close message with CloseCause set to EDPs_completed is sent to the SCP.
O_Answer	PS	
O_CPB	PS	
O_NoA	PS	
T_Answer	PS	
T_Busy	PS	
T_NoA	PS	
O_Disconnect	PS	O_Disconnect cannot be armed after the call has been Redirected by LOD/LOR. O_Disconnect event that are armed before the call has been redirected will be detected when the Originator disconnects.
O_Disconnect_Called	S	O_Disconnect_Called can be armed and detected after the call has been forwarded.
Timeout	S	Timeout can be armed and detected after the call has been forwarded.

24.16.3 Other interactions with LOD and LOR

Table 516 provides other interactions with LOD and LOR.

Table 516 Other interactions with LOD and LOR

Description	Status	Interactions
RedirectingPartyID	S	When the call overflows to the LOD DN, the hunt group pilot DN is stored as the AIN redirecting party with redirecting reason set to “user busy”. The overflow to the LOD DN is treated as an AIN redirection and the redirecting information is used to build the redirection query parameters in subsequent signaling (the call routes over ISUP, PRI or SMDI). The LOD redirection data is also used to build the UserID parameter in subsequent AIN query messages.
UserID	S	
Create_Call	S	When the CallingPartyID is an LOD DN, the Create_Call request processes.

List of terms

This document contains a list of terms used exclusively for advanced intelligent networks (AIN).

Other DMS-100 switch related terms can be found in the reference manual, NTP 297-1001-825, *Glossary of Terms and Abbreviations*.

Numerical entries

0+MDS

See Call Messenger feature.

00Y

A code used to provide information about the calling party when calling address and automatic number identification (ANI) information is not available. 00Y codes are also used when a trunk group comes in from another office that serves more than one numbering plan area (NPA). The 00Y code is mapped to the serving NPA of the calling party. 00Y calls are usually feature group C (FGC) calls.

1+MDS

See Call Messenger feature.

1FR

one-party flat rate line

10FR

ten-party flat rate line

911 Service

Basic 911 Emergency Service

A entries

AAB

abstract syntax notation 1 (ASN.1)

ACM

address complete message

additional functional call (AFC)

A service assigned to a directory number (DN) on a functional terminal, permitting multiple calls to the DN.

address complete message (ACM)

A Common Channel Signaling No. 7 (CCS7) protocol message sent backward that indicates all the address signals required for routing the call to the called party have been received and that the call can be routed.

ADO

ADD option

advanced intelligent network (AIN)

A network designed as a service control architecture that is engaged during basic call processing. Once engaged, predefined logic using a common set of service independent functions directs subsequent call-processing actions. After the service control functions are completed, basic call processing resumes.

AIN is an evolution of the Common Channel Signaling No. 7 (CCS7) intelligent network (IN). By providing generic external influencing of call processing, AIN enables an operating company to create its own services for its subscribers.

advanced intelligent network response (AINRES)

An option for the translation verification (TRAVER) command line that simulates the processing of certain types of responses coming back from the service control point (SCP).

AFR

automatic flexible routing.

AGENTIDX

agent index

AIN

advanced intelligent network

AINDENY

denial of AIN services

AINF

advanced intelligent network (AIN) final treatment

AIN Maintenance parameter (AMP)
Parameter AMP marks and traces test calls and activates logging on selected calls through the network.

AINRES
advanced intelligent network response

ambiguous speed call (AMBISC)
A feature that allows speed call users to dial speed call access codes and abbreviation codes without using the asterisk (*) prefix.

AMP
AIN Maintenance parameter

ASN
See abstract syntax notation.

ASN.1 encoding rules
Rules that specify the representation during transfer of the values of any ASN.1 type. The ASN.1 encoding rules enable the information being transferred to be identified by the recipient as a specific value of a specific ASN.1 type.

ASOC
advanced intelligent network (AIN) software optionality control

AT&T
American Telephone & Telegraph Company

automatic code gap (ACG) message
A type of message parameter that is sent to a service switching point (SSP) to control the rate at which new initiating events are generated. An ACG is used to control congestion.

B entries

basic business group (BBG)
A feature that provides the basic capabilities for handling a group of lines associated with a single customer. BBG includes provision for special dialing arrangements, special restriction arrangements, and special announcement capability for the switch to recognize the association of the customer's lines as a group.

basic call service view (BSV)
The objective of Basic Call Service View (BSV) is to isolate the AIN application service element (ASE) and its children from the changes in Basic

Session Service (BASS), User Service Agent (USA), and Network Service Agent (NSA) and to encapsulate all agent-specific processing.

basic session service (BASS)
A session transactor that has a basic call root service active.

BASS
basic session service

BBG
basic business group

BCD
binary-coded decimal

Bell operating company (BOC)
Operating company resulting from AT&T divestiture.

binary-coded decimal (BCD)
A numerical system in which each digit of a decimal number is expressed separately as a 4-bit binary number.

BKG
background class

BLF
Busy Lamp Field

BOC
Bell operating company

BRISC
Bell-Northern Research (BNR) reduced instruction set computing

BSV
See Basic Call Service View.

Business Set Short Hunt
A feature that allows incoming calls to hunt through a set of directory numbers (DN) for an idle DN on which to terminate. The set of DNs can be either standard DN appearances or multiple-appearance DNs, and the set can include all or a subset of the DNs on a Meridian business set (MBS).

C entries

Call Forwarding Group Don't Answer (CFGD/CFGDA)

A feature that allows calls to idle hunt group members to be forwarded if the call is not answered within a certain amount of time.

Call Forwarding Programming (CFWP)

The process that directs incoming calls to a predetermined telephone number.

Call Forwarding Remote Access (CFRA)

A feature that allows a user with Call Forwarding Universal (CFU), Call Forwarding Intragroup (CFI), or Call Forwarding Fixed (CFF) to activate CFU, CFI, or CFF from a remote line through direct inward system access (DISA).

Call Forwarding Validation (CFWVAL)

A feature that provides a means of verifying whether a line has successfully forwarded when a user activates Call Forwarding. There are two variants of CFWVAL: (1) termination validation, which checks that a call completes to the forward number; (2) routing validation, which sends a confirmation tone when the system determines that the call routes successfully and call forwarding is activated.

call hold (CHD)

A feature that is available to Meridian Digital Centrex (MDC) end-users with 500/2500 sets. The feature allows an end-user to hold one call for any length of time. This feature is activated by dialing a feature code (for example, *9) after a switchhook flash.

Call Party Handling (CPH)

The Call Party Handling(CPH) capabilities provide support for basic mid-call event processing for 2-party and 3-party calls.

Calling Line Number Display (CLIDSP)

An option that allows the end-user to control the format of the calling line address on business set displays.

Calling Name and Number Display (CNND)

A feature that is activated by the user and indicates that the user's name and directory number can be displayed at the terminating set.

Calling Name Delivery (CNAMD)

A feature that displays the name of the calling party on the called party's set if the called set has a suitable display window.

Calling Name Delivery Blocking (CNAB)

A Custom Local Area Signaling Service (CLASS) feature that allows subscribers to control, for each outgoing call, whether their name is displayed on the set of the called party.

calling party ID

calling number

A feature that allows an end-user to access a messaging service after an unsuccessful local or 1+ toll call. The feature routes the end-user's call from the end office (EO) to either a Traffic Operator Position System (TOPS) switch or an interexchange carrier's (IEC) service gateway where the messaging service system is connected. The end-user can then leave a message for a recipient through the messaging service. This feature is also known as 1+MDS and it compliments the 0+MDS feature.

call processing (CP)

The function of DMS-100 call-processing software is to establish connections among telephony agents. A number of functional steps are required to process a call, such as detecting the incoming call, receiving digits, analyzing (translating) digits to determine call destination, selecting terminating agent, establishing connection, signaling to and detecting an answer from the terminating agent, and detecting disconnect.

Call Screening/Monitoring Intercept (CSMI)

A feature that provides subscribers of a network-based answering service (NBAS) with a means of monitoring and intercepting calls that are being handled by the NBAS.

call segment (CS)

A functionally separate call portion in a service switching point (SSP) that is accessible to a service control point (SCP) or adjunct through a connection view (CV). For a two-party call, a CS consists of either the originating or terminating call portion in the AIN switch. For a multiparty call, a CS consists of multiple originating and terminating call portions merged together in the SSP for one end-user.

call segment association (CSA)

A relationship between two call segments (CS) of different calls in a service switching point (SSP) for the same end-user. The SSP establishes the relationship if the two CSs share a common controlling leg or if the leg status of the controlling leg is "pending" in one CS and is anything but "pending" in the other CS (that is, the end-user or virtual party supported by the leg is only actively participating in one CS at a time).

call segment identifier (CSID)

A number that identifies a call segment (CS).

call transfer (CXR)

A feature that allows a subscriber to instruct the switching equipment or operator to transfer any incoming calls to another station.

call type (CT)

An option used to specify which type of call (for example, voice or data) may trigger and send a query message.

call waiting origination (CWO)

A Meridian Digital Centrex (MDC) feature that allows an originating line to impose a call waiting tone on a busy called line.

capability set 1 (CS-1)

The first set of advanced intelligent network (AIN) capabilities to be standardized by CCITT/ITU-T. CS-1 is documented in the *CCITT/ITU-T Intelligent Network (IN) Recommendations (Q.1200-series)*.

carrier access code (CAC)

A set of three digits designating the inter-LATA or international carrier (INC) that handles a call. Also known as carrier identification digits.

CBE

Call Forwarding Busy (CFB) Exclude Intragroup

CBECBU

Call Forwarding Busy (CFB) Exclude External Originators/Unrestricted Forwarding

CBI

Call Forwarding Busy (CFB) Block Intragroup

CBICBU

Call Forwarding Busy (CFB) Intragroup Deny Unrestricted

CBQ

Call-Back Queuing

CBU

Integrated Business Network (IBN) Call Forwarding Busy Unrestricted

C-bus

channel bus

CDAR

Customer-Dialed Account Recording

CDCL

Code Calling

CDE

Call Forwarding Don’t Answer (CFD) Exclude Intergroup

CDECDU
Call Forwarding Don't Answer (CFD) Exclude External Originators/Unrestricted Forwarding

CDI
Call Forwarding Don't Answer (CFD) Exclude Intragroup

CDPCODE
Customized Dialing Plan Code

CDPFAC
Customized Dialing Plan Feature Access Code

CD-ROM
compact-disk, read-only memory (CD-ROM)

CDT
Custom Integrated Business Network (IBN) Disconnect Treatment (CDT)

CDU
Integrated Business Network (IBN) Call Forwarding Don't Answer Unrestricted

CFBL
Call Forwarding Busy Line

CFGDA
Call Forwarding Group Don't Answer

CFK
Call Forwarding on a Per-Key Basis

CFMDN
Secondary Multiple Appearance Directory Number Call Forwarding

CFRA
Call Forwarding Remote Access

CFS
Integrated Business Network (IBN) Call Forwarding Simultaneous/Screening

CFWP
Call Forwarding Programming

CFWVAL
Call Forwarding Validation

CFXU

Universal Access to Call Forwarding

CH

consultation hold

channel bus (C-bus)

A proprietary duplicated time division multiplexed (TDM) bus. The C-bus interconnects network interface units (NIU) with link interface units (LIU).

CHD

call hold

CHG

charge option, basic rate access functional set (BRAFS)

CI

Collect Information

CIC

Carrier Identification Code

CIDB

Calling Identity Delivery Blocking

CIDS

Calling Identity Delivery and Suppression

CIFR

Call_Info_From_Resource message

CITR

Call_Info_To_Resource message

CLASS—Message Waiting Indicator Ring Notification (CRN)

A feature that provides periodic ringing for Station Message Waiting (MWT) subscribers with CLASS Message Waiting Indicator (CMWI) notification. CRN is a combination of stuttered dial tone, immediate ringing, and periodic ringing.

CLIDSP

Calling Line Number Display

CMCF

Controlled Multiple Call Forwarding

CNA

Calling Number Announcement

CNAB

Calling Name Delivery Blocking

CNAMD

Calling Name Delivery

CNDBO

Calling Number Delivery Blocking Override

CNF30

Super Conference

Code Restriction (CRL)

A feature that denies or allows selected station lines and network-access trunks the ability to complete outgoing-exchange network calls based on the dialing pattern. The restricted calls are routed to an attendant, an announcement, or a tone on an individual end-user basis.

compact-disk, read-only memory (CD-ROM)

A compact disk adapted for home entertainment that is capable of storing video and audio data in digital format for playback through a computer. Data bits are stored as microscopic pits on the disk and are read by a laser beam.

connection view (CV)

A connection view (CV) provides a service platform with a generic representation (that is, view) of switch call-processing resources. CV processing, within the switch, can be viewed as translating external instructions into operations that are understood by internal switch call processing as well as translating internal call-processing events and the state of internal call-processing resources into information that is understood by external devices such as a service control point (SCP) or adjunct. The switch call-processing resources are described by a set of CV objects, which include the following: call segment association (CSA), call segment (CS), legs, connection point (CP), basic call model (BCM) composed of points in call (PIC) and detection points (DP), CV-related timer, and CV-related monitors.

controlling leg

The leg closest to the access side of the call. For an originating call portion, the controlling leg is the calling party. For a terminating call portion the controlling leg is the called party. Access signaling on this leg can directly control the progress of the call. In a call segment, only one leg is directed toward the originating or a terminating access and it is the controlling leg. *See also* passive leg, and leg.

conversation package

A transaction capabilities application part (TCAP) package expecting a reply. The service control point (SCP), or adjunct, sends a conversation package to the service switching point (SSP) that instructs the SSP to perform an activity and send a reply to the SCP. The SSP can also send a conversation package to the SCP. *See also*TCAP package.

cookbook

A document that provides datafilling examples for the advanced intelligent network (AIN) service switching point (SSP). The examples are organized by trigger and response type.

CPG

Call Progress

CR

Cancel Resource

CS

call segment.

CS-1

capability set 1

CSA

call segment association

CSID

call segment identifier

CSMI

Call Screening/Monitoring Intercept

CT

call type

CTM

conference trunk module

CTR

connect to resource

CTW

Call Transfer Warning

Customer-Dialed Account Recording (CDAR)

A feature that allows variable-length account codes to be entered on a per-call basis, along with predefined prefix digits to be prefixed to the calling number. This feature is not compatible with the off-hook immediate trigger.

customer dial plan (CDP)

A trigger that can be subscribed by a customer group assigned to a customized dialing plan. This triggering criteria is met when an access code, extension number, or vertical service code within a customized dialing plan is dialed. It is applicable to the information analyzed trigger detection point (TDP).

Custom Integrated Business Network (IBN) Disconnect Treatment (CDT)

A feature that allows the operating company to assign a disconnect treatment to a Meridian Digital Centrex (MDC) line on an individual directory number (DN) basis.

CUTTD

Cut-Through Dialing

CV

connection view

CWC

Call Waiting Chaining

CWD

Dial Call Waiting

CWI

Call Waiting Intragroup

CWX

Call Waiting Exempt

D entries

DCBI

directed call pickup with barge-in

DCBU

directed call pickup with non-barge-in

D-channel

A channel that carries call control messages between a terminal on an integrated services digital network (ISDN) interface and the exchange termination. Call control messages are used to set up, maintain, or clear a

circuit-switched call on a B-channel. The D-channel also carries low-speed packet data between a terminal on an ISDN interface and a terminal in the packet data network. For a primary rate interface (PRI), the D-channel is a 64-kbit/s bidirectional channel. *See also* Bb channel, basic rate interface (BRI), and primary rate interface (PRI).

DCP

deferred call processing

DCPK

Directed Call Park

DCPU

directed call pickup

DCR

Dynamic Call Routing

Denied Incoming (DIN)

Because the DIN feature is a customer group-based feature, any calls coming in from outside the customer group are denied. Any calls that are not considered intragroup as defined in Integrated Business Network (IBN) translations are denied even if the originator and terminator are in the same customer group.

Denied Termination (DTM)

A feature that prevents a line receiving calls. The line can only originate calls.

detection point (DP)

A point in basic call processing, as modeled by the basic call model (BCM), that identifies when a service control point (SCP) or adjunct can receive a report of a given event and influence subsequent call-processing. DPs are located at transitions between points in call (PIC) in the BCM. Two types of DPs exist: trigger detection points (TDP) and event detection points (EDP). *See also* trigger detection point (TDP), event detection point (EDP), point in call (PIC), and exit event.

DG

digits dialed

Dialable Directory Number (DDN)

A feature that enhances the Calling Number Delivery (CND) feature. DDN displays the calling number in a format that allows the user to return a call easily.

digits dialed (DG)

An option used to specify which digits must be dialed for a call to trigger and send a query message.

DIN

Denied Incoming

directed call pickup with barge-in (DCBI)

A feature that allows the Meridian Digital Centrex (MDC) subscriber to barge in and connect to an incoming call intended for another line in the same customer group and served by the same DMS-100 switch.

directed call pickup with non-barge-in (DCBU)

A feature that allows a subscriber to answer an incoming call that is ringing another line in the same customer group and served by the same DMS-100 switch.

distributed intelligent network architecture (DINA)

DINA is the advanced intelligent network (AIN) architecture for the DMS-250 switch.

Distributed Line Hunt (DLH)

A hunting arrangement that consists of lines divided into groups. The hunt is sequential over all groups until a line in an available group is selected.

DLH

Distributed Line Hunt

DMS

Digital Multiplex System

DMS-SCP

service control point

DMS-SSP

service switching point

DOR

Denied Origination

DP

detection point

dial pulse

DQS

Display Queue Status

DQT

Display Queue Status

DRING

Distinctive Ringing

DRU

development release unit

DS-3

A 44.6-Mbit/s digital signal comprised of 28 multiplexed DS-1 signals.

DSCWID

Spontaneous Call Waiting Identification with Disposition

DTMF

dual tone multi frequency

Dynamic Call Routing (DCR)

A technique that changes call-routing patterns depending on the network load. DCR provides significant cost efficiencies, increased flexibility, and increased network survivability in comparison to traditional, hierarchical call routing.

E entries

EAMF

equal-access multifrequency

EAP

equal access plan

EBO

executive busy override

EBOM

Executive Busy Override on Multiple Appearance Directory Number

EDP

event detection point

EDP-N

event detection point (EDP), and notification

EDP-R

event detection point (EDP), and request

EDRAM

enhanced digital recorded announcement machine

EHLD

electronic key telephone service (EKTS) hold for use by Service Order System (SERVORD)

EMW

Executive Message Waiting

encapsulation

object-oriented programming

end-office display (EOD)

An option that provides the capability to display the calling party number and the dialed 800 number by the calling party on Call Management Service (CMS) and Custom Local Area Signaling Service (CLASS) terminals.

end-user

An addressable network user (business or residential) who employs either analog, public switched data service (PSDS), or integrated services digital network (ISDN) access-signaling arrangements.

enhanced outward wide area telephone service (EOW)

A wide area telephone service (WATS) available in the residential services environment that provides outward WATS for equal-access end offices (EAEO).

enhanced two-way WATS (ETW)

enhanced two-way wide area telephone service

enhanced two-way wide area telephone service (ETW)

A wide area telephone service (WATS) available in the residential services environment that combines enhanced outward wide area telephone service (EOW) and inward wide area telephone service (INWATS) line class code capabilities.

EOD

end-office dialing. *also* end-office display

equal-access multifrequency (EAMF)

A type of trunk signaling in the equal-access feature group B environment that translates and turns a call into the correct carrier.

escape code (ESC)

An option used to specify that only calls in which an escape code has not been dialed may trigger and send a query message.

escape coin (ESCCN)

An option used to specify which call types should escape this trigger. This option only affects coin line originated calls and may only be datafilled for the Specific_Digit_String (SDS) trigger.

escape DN (ESCDN)

An option used to specify that calls to a directory number (DN) that resides on the switch should not trigger. This option may only be datafilled for the Local Number Portability (LNP) trigger.

escape equal access (ESCEA)

An option used to specify that equal access calls should not trigger. This option may only be datafilled for the Specific_Digit_String (SDS) trigger.

escape operator (ESCOP)

An option used to specify that calls going to an operator should not trigger. This option may only be datafilled for the Specific_Digit_String (SDS) trigger.

ESCCN

escape coin

ESCDN

escape DN

ESCEA

escape equal access

ESCOP

escape operator

ESCO

emergency service central office number

ETW

enhanced two-way wide area telephone service

event detection point (EDP)

A point in basic call processing, as modeled by the basic call model (BCM), that can be armed by the receipt of a Request_Report_BCM_Event message from the service control point (SCP) or adjunct. The EDPs are located at transitions between points in call (PIC). EDPs can be armed as requests (EDP-R) or notifications (EDP-N). When the requested event occurs, the switch reports it to the SCP or ‘adjunct. *See also* detection point (DP), trigger detection point (TDP), point in call (PIC), requested event, request, and notification.

EWAL

enhanced wide area telephone service (WATS) access line

executive busy override (EBO)

A feature that enables an end-user on a Meridian Digital Centrex (MDC) line to gain access to a busy line in the MDC group.

Executive Busy Override on Multiple Appearance Directory Number (EBOM)

A feature that allows a caller to barge in on a call involving Multiple Appearance Directory Number (MADN) Selective Call Acceptance (SCA) or MADN multiple call arrangement (MCA), but only if the calling party and called party are in the same customer group.

Executive Conference (MMCONF150)

A feature that provides enhancements to the Meet-me Conference feature. It provides the following optional capabilities for a Meet-me Conference; allows a Meet-me Conference size of up to 150 participants (the previous limits were 6 or 30 participants); provides feature access codes to lock and unlock access to the conference (previously, the only method of conference control was by hookswitch flash); and allows the controller of the conference to add new conferees without assistance from the attendant.

Executive Message Waiting (EMW)

Executive Message Waiting (EMW) consists of three features: Message Service—Message-List Editing; Message Service—Leave Message; and Call Request Enhancement.

Together, these three features enable end-users to leave and retrieve messages at a Meridian business set (MBS) with display.

expanded Bellcore AMA format (EBAF)

expanded Bellcore automatic message accounting format

extended VANC

extended voice-activated network control

extended voice-activated network control (VANC)

A service that encompasses the capabilities provided by initial VANC, while adding the ability to use voice commands to edit lists for services, such as Selective Call Forwarding (SCF), or to request the status of subscribed features (for example, active or inactive). Extended VANC is under consideration for the future. *See also* initial voice-activated network control (VANC), voice-activated network control (VANC), and voice-activated dialing (VAD).

F entries

FAC

feature access code

facsimile (FAX)

A system of transmitting and reproducing graphic matter, such as printing or still pictures, by means of signals sent over telephone lines. Also, the copy produced by such a system.

FAX

facsimile

FAX Messaging Platform (FMP)

The FMP stores facsimiles (FAX) which have been forwarded from the FAX-Thru Service (FTS) when FTS detects a busy or no-answer condition. The FMP will ensure that the FAX is transmitted from storage to the original destination when the destination FAX machine is available. *See also* FAX-Thru Service (FTS).

FAX-Thru Service (FTS)

The FTS feature is a Special Delivery Service (SDS) enhancement which upon detection of a busy or no-answer condition allows routing of a facsimile (FAX) call to a FAX Messaging Platform (FMP). *See also* FAX Messaging Platform (FMP), and Special Delivery Service (SDS).

feature

A unit of one telecommunications-based capability that can be provided to an end-user.

feature access code (FAC)

A code used by subscribers for controlling and accessing custom calling services.

feature activator (FA)

The key on an integrated services digital network (ISDN) stimulus terminal with circuit-switched service that activates supplementary features such as Ring Again (RAG).

feature group A (FGA)

A plan for the generation of a billing record for a terminating feature group call.

feature group B (FGB)

A plan that allows an equal-access end office (EAEO) or a non-EAEO to provide subscribers with access to FGB carriers. To use this plan, the subscriber must dial 950-WXXX.

feature group C (FGC)
A plan for equal access (EA) that implements the equal access plan (EAP) with the following exceptions: it uses FGC signaling (predivestiture signaling) and it uses additional trunk group types.

feature group D (FGD)
A plan for equal access (EA) that implements the equal access plan (EAP).

FGA
feature group A

FIE
facility information element

FIG
Flash Ignore

Fire Reporting System (FRS)
A feature that is required for lines that interface with dial dictation equipment, which sends off-hook signals back to the switch.

Fire Reporting System, Origination (FRO)
Software that indicates, at a remote location, the busy or idle status of a line. The FRO operates a signal distribution point for each call originating from or terminating to a line that has the FRO enabled.

Flash Ignore (FIG)
A feature that causes the switching unit to ignore the flash signal from that line.

FLEXI
Flexible Intercept

Flexible Intercept (FLEXI)
A feature that allows for the automatic rerouting of calls that cannot be completed because of equipment limitations, imposed restrictions, or dialing irregularities. Calls are routed to the attendant, a tone, or an announcement.

FMP
FAX Messaging Platform

FSM
finite state machine

FTS
FAX-Thru Service

FXR

Fast Call Transfer

G entries

GAME
generic AIN message encoder/decoder

generic AIN message encoder/decoder (GAME)

A part of the advanced intelligent network (AIN) service switching point (SSP) platform. GAME provides messaging capabilities for AIN applications, which include encoding the data passed by an application and sending the encoded message to an external database (service control point [SCP] or adjunct); and receiving a message from the external database (SCP or adjunct), decoding it, and returning the result to the application.

global title address (GTA)

An address, such as dialed digits, that does not explicitly contain information that would allow routing in the signaling network (that is, the translation function of the service control point (SCP) is required). Formarly known as global title value (GTV).

global title value (GTV)

See global title address (GTA). GTA replaces GTV in current documentation. This is consistent with efforts to standardize common channel signaling (CCS) terminology.

GMS

Generic Multiplexing Service

GOS

grade of service

GPS

Global Product Support

GTA

global title address

GTV

global title value

H entries

harmonic ringing

A system of selectively signaling several parties on a party line by using a different frequency and a specially tuned ringer for each party. The frequencies are harmonics of 16 2/3 Hz and 25 Hz as follows: 16 2/3 Hz, 25 Hz, 33 1/3 Hz, 50 Hz, and 66 2/3 Hz. *See also* frequency selective ringing (FSR).

HCB

history control block

HDB

history data block

HF

hands-free unit

HFMUTE

combined hands-free/mute

HLD

permanent hold

I entries

IAM

initial address message.

ICMSG

Intentional Call Messenger

IDDD

international direct distance dialing

IEC

interexchange carrier

IECFB

Internal/External Call Forwarding Busy Denied

IECFBCBU

Internal/External Call Forwarding Busy Unrestricted

IECFD

Internal/External Call Forwarding Don’t Answer Denied

IECFDCDU

Internal/External Call Forwarding Don’t Answer Unrestricted

INAP

intelligent network application protocol

incremental software delivery (ISD) process

A process that enables a service to be delivered to a product without the need for a complete batch change supplement (BCS).

initial address message (IAM)

The first message in a call (connection oriented or connectionless) that contains information required to route the call to its destination.

initial voice-activated network control (VANC)

A service that allows simple activation and deactivation of vertical services by speaking one of a limited set of service names. Initial VANC is an AIN 0.2 service driver. *See also* extended voice-activated network control (VANC), voice-activated network control (VANC), and voice-activated dialing (VAD).

intelligent network application protocol (INAP)

A protocol developed by the European Telecommunications Standards Institute (ETSI) for the European intelligent network (IN). It defines the protocol required for the support of capability set 1 (CS-1).

Intentional Call Messenger (ICMSG)

A feature that automatically allows callers to leave messages for the parties of their choice. Callers do not have to attempt to reach the message recipient beforehand.

IP

intelligent peripheral

IPUI

intelligent peripheral user interaction

IRR

Inhibit Ring Reminder

ISDNI

integrated services digital network (ISDN) interface

ISDNUP

ISDN user part

IT

inter-toll dialing. *also* inter-toll trunk (IT)

K entries

Keyset Short Hunt Group (KSH)

A feature that allows calls to hunt from one directory number (DN) to another on the same keyset.

Key Short Hunt (KSHUNT)

KSHUNT provides information to operating companies on the use of the Business Set Short Hunt feature. *See also* Business Set Short Hunt.

KSH

Keyset Short Hunt Group

KSHUNT

Key Short Hunt

KSMOH

Key Set Music on Hold

L entries

LCO

Local Coin Overtime

LDA

Long Distance Alert.

LDAE

Long Distance Alert Enhancement

LDS

Long Distance Signal

leg

A communication path from a connection point toward an end-user.

LEN

line equipment number

LIF

logical interface

line appearance on a digital trunk public safety answer point (LDTPSAP)

One of three types of public safety answering points (PSAP), LDTPSAP makes use of line appearance on a digital trunk (LDT) software. It is connected through a trunk interface that receives automatic number identification (ANI), but LDTPSAP appears to the central control (CC) as a hunt group line. *See*

also line appearance on a digital trunk (LDT), line-ended PSAP (LINEPSAP), public safety answering point (PSAP).

line class code (LCC)

An alphanumeric code that identifies the class of service assigned to a line.

local primary interexchange carrier (LPIC)

A feature that allows Subscriber Services subscribers to choose a primary carrier for intra-LATA service. *See also* primary interexchange carrier (PIC).

Long Distance Alert (LDA)

A feature that provides end-users with an indication of an incoming call by providing distinctive ringing or distinctive call waiting tones on the called line. The operating company may specify a time-out period within which the called party must respond to the LDA distinctive call waiting tones. If the called party does not respond within that period, the call is routed to the No Terminal Responding (NTRS) treatment. If no time-out is specified, the behavior is the same as the regular call waiting feature. The LDA feature notifies end-users of incoming toll calls in both the on-hook and off-hook conditions. *See also* Long Distance Signal (LDS).

Long Distance Alert Enhancement (LDAE)

LDAE enhances the Long Distance Signal (LDS) feature by introducing the following functions: ability to provide LDS as a ring, tone, or a ring and tone line option; ability to specify the duration of the time-out for call waited calls; and the ability to specify whether distinctive alerting is provided when no CallingLineID (CLID) is delivered.

Long Distance Signal (LDS)

A feature that provides end-users with distinctive ringing or distinctive call waiting tones on the called line to indicate an incoming toll call. *See also* Long Distance Alert (LDA).

M entries

M536

A 36-button add-on module for a Meridian business set.

Make Busy Key (MBK)

A feature that creates a Make Busy Key (MBK) line option. When the MBK option is assigned, a scan point circuit, which is controlled by an external key, is associated with the line. The external key is used to activate the MBK line option. The MBK function allows the set, to which MBK is assigned, to appear as if it is busy with respect to call forwarding (CF).

MAN

Manual Line (MAN)

Manual Line (MAN)

A manual service line option that is similar to the Automatic Line (AUL) feature except that the originator is always connected to the operator. *See also* Automatic Line (AUL).

MAP command interpreter (MAPCI)

A CI at the MAP level for accessing maintenance and other functional levels. *See also* command interpreter (CI).

MBG

Multilocation Business Group

MBK

Make Busy Key (MBK)

MBSCAMP

Meridian business set (MBS) Station Camp On

MCDN

Message Center Directory Number

MDE

message departure element

MDM

multiple data message

MDNNAME

Multiple Appearance Directory Number (MADN) Member Name Display

MDR

message detail recording

Meet-me Conference (MMC)

A feature that allows end-users to meet in a conference call by dialing a Meet-me Conference directory number (DN) at an agreed-upon date and time. *See also* Executive Conference (MMCONF150), and Super Conference (CNF30).

MEMDISP

directory number (DN) network attribute Multiple Appearance Directory Number (MADN) Member Display option

Meridian ACD (MACD) with CompuCALL options
An application that allows the concurrent delivery of voice calls and data from the user's host computer to an answering automatic call distribution system (ACD) agent.

message parameters
Parameters that are within a message. Each message type has its own set of mandatory and optional parameters.

message switch (MS)
A high-capacity communications facility that functions as the messaging hub of the dual-plane combined core (DPCC) of a DMS SuperNode processor. The MS controls messaging between the DMS-bus components by concentrating and distributing messages and by allowing other DMS-STP components to communicate directly with each other.

message waiting query (MWQRY) key
The message waiting query key on an electronic business set (EBS).

MF
multifrequency

MLAMP
Multiple Appearance Directory Number Lamp

MLH
Multiline Hunt

MLHG
Multiline Hunt Group

MLVP
Multiline Variety Package

MMC
Meet-me Conference

MMCONF150
Executive Conference

MPB
Multiparty Bridge

MPH
Multiple Position Hunt

MREL

Multiple Appearance Directory Number Release

MRF

Multiple Appearance Directory Number (MADN) Ring Forward

MSBI

Make Set Busy Intragroup

MSC

message sequence chart

MULTICFA

Multiple Call Forwarding for Call Forwarding Universal (CFU)/Call Forwarding Intragroup (CFI)

MULTICFB

Multiple Call Forwarding Busy

MULTICFD

Multiple Call Forwarding Don't Answer

multifrequency (MF)

A signaling method that makes use of pairs of standard tones to transmit signaling codes, digit pulsing, and coin-control signals. This method is used by interregister signaling on analog trunks. *See also* interregister signaling.

Multiple Appearance Directory Number Lamp (MLAMP)

An option that is recommended for Multiple Appearance Directory Number (MADN) groups that need to know when a call is bridged or on hold which makes the call available to other MADN group members. When a call is not bridged, and the MADN group member invokes autohold, the lamp winks to indicate that the call is on hold and any MADN group member can pick up the call.

Multiple Appearance Directory Number, multiple call arrangement (MADN-MCA)

A Multiple Appearance Directory Number (MADN) configured so that more than one telephone set can be active simultaneously. *See also* multiple call arrangement (MCA).

Multiple Appearance Directory Number Release (MREL)

In a typical Multiple Appearance Directory Number (MADN) Selective Call Acceptance (SCA) call scenario, multiple MADN members are involved in a bridged call with an external party. When the external party disconnects, the MADN members remain in a bridged call. MREL changes this functionality so that when the external party disconnects, the bridge is taken down and the MADN members are automatically disconnected.

Multiline Hunt (MLH)

A feature that routes each call to a line in a hunt group by trying each line in a numerical sequence until the call is answered. All calls start at a single directory number (DN), which is known as the pilot. No other lines in the hunt group have DNs.

Multiway Call

A set of features that allow a subscriber to set up conference calls. The Multiway Call features supported are Three-way Call (3WC), Super Conference (SUPERCONF), and Executive Conference. *See also* Three-way Calling (3WC), Super Conference (CNF30), and Executive Conference (MMCONF150).

MUMR

multi-unit message rate

MUTE

Mute feature

MWIDC

message waiting indication

MWQRY

See message waiting query.

N entries

N11

A generalization of the dialing codes for special services, such as 411 for information services, 611 for telephone repair services, and 911 for emergency services.

NAC

non-area code, network administrative center

Name and Reason Display (REASDISP)

A feature that allows a name and reason to be displayed for incoming and outgoing calls on a Meridian business set (MBS) with display. Parties originating a call are able to see the name of the called party. Parties receiving a call are able to see the name of the calling party.

NANP

North American Numbering Plan

NARS

network access registers

NBAS

network-based answering service

NCRB

non-call-related base

NEL

next event list

network elements

Processor-controlled entities of the telecommunications network that primarily provide switching and transport network functions and contain network operations functions. Examples are non-AIN switching systems, digital cross-connect systems, AIN switching systems, and signal transfer points (STP).

network ring again (NRAG)

A feature that allows Meridian Digital Centrex (MDC) end-users who encounter a busy anywhere in their customer group to call that station again automatically.

network service agent (NSA)

An NSA is an object that is encapsulated by an active service element's (ASE) service agent. An NSA, in turn, encapsulates a network service protocol (NSP) and, within sessions, a remote bearer channel (RBC). An NSA thus provides a focal point for managing network-side signaling and connection functions.

network service protocol (NSP)

An NSP is a service protocol object that is encapsulated by a network service agent (NSA).

network systems

Processor-controlled entities of the telecommunications network that provide ancillary network functions and contain network operations functions. Examples are service control points (SCP), adjuncts, and intelligent peripherals (IP).

next event list (NEL)

A list of requested events associated with an open transaction that is maintained at the switch. The service control point (SCP) or adjunct requests these events using the Request_Report_BCM_Event message. *See also* requested event, and event detection point (EDP).

NFA

Network Facility Access

NFRA

Speech-activated Intelligent Dialing (SAID) remote access

Night Service Directory Number (NSDN)

An option that allows calls to be rerouted either to a predetermined directory number (DN) or to a busy signal when the consoles are unattended.

NI-2

national ISDN-2

No Receiver Off-hook Tone (NOH)

A feature that prevents a line from receiving a receiver off-hook tone when the line has a permanent signal or partial dial tone.

Nortel

See Nortel Networks.

Nortel Networks

Nortel Networks is a global leader in telephony, data, wireless and wireline solutions for the Internet. (Nortel Networks was previously called Nortel, and Northern Telecom [NT].)

North American Numbering Plan (NANP)

A numbering plan for the Public Switched Telephone Networks (PSTN) of the United States, Canada, northern Mexico, and the Caribbean. The plan divides each region into geographical areas. Each geographical area has its own distinctive three-digit area code, and no two telephone subscribers in the same area code will have the same seven-digit telephone number. *See also* numbering plan area (NPA), and public switched telephone network (PSTN).

Northern Telecom

See Nortel Networks.

notification

An event whose detection causes the switch to report the event to the service control point (SCP) or adjunct without halting the call processing. *See also* switch notification message, and request.

NPASPLIT

numbering plan area (NPA) split

NPI

numbering plan indicator

NRAG

network ring again

NRS

Network Resource Selector

NSA

network service agent

NSDN

Night Service Directory Number)

NT

See Nortel Networks.

NTNA

Northern Telecom North America

NTRS

No Terminal Responding

numbering plan indicator (NPI)

The directory number (DN) for primary rate interface (PRI) trunks that is used to populate the USERID parameter in the format of PUBLIC and TEN-DIGITS.

NXID

number exchange identification

O entries

OA

operations applications

OAM

operation, administration, and maintenance

OBC

originating basic call

OBCM

originating basic call model

object

A self-contained module of data and its associated processing.

object-oriented programming (OOP)

A programming technology that is more flexible than standard programming. It is a form of modular programming that allows pieces of software to be reused and interchanged between programs.

C++ is becoming the mainstay OOP language, because it combines traditional C programming with object-oriented features.

object-oriented (OO) technology

A paradigm that views the world as objects rather than as procedures. Object-oriented analysis (OOA), object-oriented design (OOD), and object-oriented programming (OOP) employ the concepts of encapsulation, classification, and inheritance. *See also* object-oriented programming (OOP).

OC-1

optical carrier 1

OCM

originating call model. *See* originating basic call model (OBCM).

off-board processor

A generic term for a service control point (SCP) or adjunct.

off-board processor service view (OSV)

The AIN Essentials off-board processor service view (OSV) contains the behavior for communicating with the generic environment for messaging on the switch. The AIN Essentials OSV establishes a signaling channel, determines the parameters needed to be sent in query messages, creates parameter objects of a signaling message and a protocol-independent set of messages (PRISM), sends messages to signaling channels, receives response messages, validates the response messages received, destroys signaling channels, and passes signaling messages to the AIN Essentials application service element (ASE) for processing. The AIN Essentials OSV encapsulates much of the behavior required to send and receive signaling messages, which allows the AIN Essentials ASE to concentrate on processing responses.

OFFHKDEL

off-hook delay (OHD)

OFS

overflow register, software

OHD

off-hook delay. Also known as OFFHKDEL.

OHI

off-hook immediate. Also known as OFFHKIMM.

OHQ

off-hook queuing

OLS

originating line select

OLI

originating line information

OOS

out of service

Open Systems Interconnection (OSI)

A seven-layered communications protocol of the International Organization for Standardization (ISO) that is intended as a public reference model of a framework that would permit network communications among many dissimilar types of devices. The physical, data link, network, and transport layers of the OSI protocol govern the interactions among the networks that transmit information. The session, presentation, and application layers govern the preparation of information for transmission and the processing of received information for storage or use. In theory, any OSI-compatible devices could use an OSI-compatible network to exchange information.

operations applications (OA)

A class of functions that provide provisioning, administration, maintenance, and management capabilities for network elements, network systems, software and services (for example., assessment of service quality over the group of systems and software that support the service). These functions usually reside in operations systems, but they can be assigned to network elements or to network systems based on the decisions of the local exchange carrier (LEC).

optical carrier 1 (OC-1)

In the synchronous optical network (SONET), OC-1 specifies the optical form of the basic 51.84-Mbit/s SONET communications channel. *See also* synchronous optical network (SONET), and synchronous transport signal 1 (STS-1).

originating line information (OLI)

Information about the calling party's directory number (DN).

OS

operations system. *See also* operations applications (OA).

OSA

operator system access

OSDN

originating station directory number

OSI

Open Systems Interconnection

OSS

Operator Services System

OSTY

originating station type

OSV

off-board processor service view

out of service (OOS)

An equipment state in which equipment is removed from service either automatically (by the system) or manually (by personnel).

P entries

passive leg

The leg furthest from the access side of the call. For an originating call portion, the passive leg is the called party. For a terminating call portion, the passive leg is the calling party. There is no access signaling on a passive leg that directly controls the progress of a call. For each passive leg there is an originating basic call model (OBCM) or a terminating basic call model (TBCM) that supports the connection view (CV). *See also* controlling leg, and leg.

passive service element (PSE)

A passive service element contains the persistent and provisioned data required to support a service. A PSE resides in the resource layer and it is provisioned against a specific resource file.

PBL

Meridian business set (MBS) individual business line

PBM

private branch exchange message rate

PCL

product CM load

PFC

public feature code

PLP

Plug Up

PLS

prime line select

Plug Up (PLP)

A feature that prevents calls from terminating to a specific line.

PODP

Public Office Dialing Plan

point in call (PIC)

A generic representation of a sequence of switch-based call-processing actions considered essential to establish, maintain, or clear a two-party call. PICs are separated by trigger detection points (TDP) in the basic call model (BCM).

PRI looparound

primary rate interface (PRI) looparound

primary interexchange carrier (PIC)

A line option that is assigned to a line when a subscriber has selected an inter-LATA carrier to handle toll calls. *See also* local primary interexchange carrier (LPIC).

private branch exchange message rate (PBM)

A message register associated with the operational measurements (OM) system that provides peg counts from 0 to 32,767 and then resets automatically to 0.

private virtual network (PVN)

A service that allows a customer to have the appearance of a private network with private network features and capabilities. It uses the public switched telephone network (PSTN) to avoid the higher costs of underused private transport facilities and to avoid the higher costs of long distance calls.

PRL

Privacy Release

programmable forward call

A feature that allows a subscriber to forward calls to a directory number (DN) other than the normal DN. The feature can be enabled or disabled, and the DN of the forwarding location can be set from any remote location. The subscriber dials a special number supplied by the operating company. The subscriber is prompted to enter a personal identification number (PIN) for verification as a legitimate user. Once verified, the subscriber enters the enable/disable request and forwarding DN. If the subscriber is successful, the subscriber is given a

confirmation message; if the subscriber is unsuccessful, the call is disconnected. *See also* call forwarding (CF/CFX).

PRS

Problem Resolution System

PRV

Multiple Appearance Directory Number (MADN) Privacy

PSD

passive service directory

PSE

passive service element

Public Office Dialing Plan (PODP)

An AIN Essentials trigger that is based on a number in a national numbering plan format.

PVN

private virtual network

Q entries

QTD

Query Time and Date

query

A type of communication message that is sent by the service switching point (SSP) to the service control point (SCP), or adjunct, requesting call-processing instructions. In AIN, the message is contained in a transaction capabilities application part (TCAP) query package. *See also* TCAP package.

R entries

RAG

Ring Again

Random Make Busy (RMB)

A feature that provides for a miscellaneous scan-point circuit controlled by an external key. The line is made permanently busy when the key is activated and is normal when the key is not activated. The same scan point can be assigned to one, several, or all lines within a hunt group, depending on which lines are made busy. This feature can be assigned in one of the following three types of

hunt groups: Directory Number Hunt (DNH), Multiline Hunt (MLH), or Distributed Line Hunt (DLH).

RBC

remote bearer channel

RDB

remote database

REASDISP

Name and Reason Display

refinable translation result (FTR)

A selector used in table IBNXLA that is required if the digit or digits dialed are the access code for the following options and features: bearer capability, dial call waiting, group intercom, loudspeaker paging answerable activation, loudspeaker, Meridian offnet access, network facility explicit access, no modem pool, prefix network resource selector (NRS) default, prefix network resource selector (NRS) outbound, speed calling access code, and voice message exchange.

remote bearer channel (RBC)

A remote bearer channel that is allocated by an active service element (ASE) to buffer connection information associated with the user at the far end of an agent interworking protocol (AIP) signaling channel. The RBC is a subclass of a bearer channel and it resides in the server layer.

Remote Message Register, Signal Distribution Point (RMS)

A feature assigned when a hardware register is to be incremented at a remote location from the DMS switch.

request

An event whose detection causes the switch to halt call processing, report the event to the service control point (SCP) or adjunct, and wait for a response. *See also* notification, and switch request message.

requested event

A switch event that has been requested by the service control point (SCP) or adjunct with a Request_Report_BCM_Event message. See also event detection point (EDP), and next event list (NEL).

Residence Enhanced Services (RES)

Software that provides for the implementation of sophisticated phone services for residential subscribers and small businesses previously serviced on plain ordinary telephone service (POTS) single-line flat rate or single-line message rate lines. Formerly known as Residential Services (RES).

response package

A transaction capabilities application part (TCAP) package containing one or more messages sent in response to another TCAP package. The service control point (SCP), or adjunct, can use a response package to instruct the service switching point (SSP) to perform an activity. The SSP can also send response packages. *See also* TCAP package.

Ring Again (RAG)

A feature that allows a calling party encountering a busy station to be connected automatically with that station when it becomes available. *See also* Network Ring Again (NRAG).

RMS

Remote Message Register, Signal Distribution Point

RMT

Remote Message Tool

RO

Remote Operation

RPA

Repeated Alerting

RSC

remote switching center

RSUS

Suspend/Request Suspension

S entries

SAID

Speech-activated Intelligent Dialing

SAM

service alteration manager

SAP

service alteration point

SCMSG

Standard Call Messenger)

SCP

Service Control Point

SCPAUSE

speed call pause insertion

screening

A telephony function that determines the eligibility to complete a call as dialed based on the class-of-service information associated with the line.

SCS

speed calling short list

SCVAL

speed call validation

SDO

smart data object

Secondary Multiple Appearance Directory Number Call Forwarding (CFMDN)

A feature that enables secondary members of a Multiple Appearance Directory Number (MADN) group to activate or deactivate call forwarding (CFW) from their sets. When this feature is activated by a member, the entire key list of the "primary" MADN member is forwarded to the specified directory number (DN).

Selective Call Messaging (SCM)

SCM is an enhancement of the Special Delivery Service (SDS). SCM allows the operating company to optionally offer a message delivery service with universal subscription. *See also* Special Delivery Service (SDS).

service management system (SMS)

The SMS is an off-line node that performs management functions. It introduces new services and customer profiles to the network. It updates the service control points (SCP) in the network through regular batch updates, thereby ensuring database consistency for customer and service information.

The SMS enables operating companies to provision and administer the SCP, adjunct, and service switching point (SSP).

service switching point (SSP)

A switch that is capable of interacting with the Common Channel Signaling No. 7 (CCS7) network databases. The SSP contains hardware to support CCS7 signaling, software to create network database query messages, and software to interpret network database response messages.

SFC

specific feature code

shared inter-office trunk trigger

A trigger that allows the identification of advanced intelligent network (AIN) calls based on particular elements of the signaling protocol, whether it is a feature group D (FGD) TR317 ISDN user part (ISUP) or TR394 ISUP.

SKDISP

Softkey Transfer

SLQ

Single Line Queuing

smart data object (SDO)

The smart data objects (SDO) are owned by the root application service element (ASE). Child ASEs can ask for a handle to the SDOs. Once the child ASE has a handle to the object, it can increment and check the counter. This mechanism is analogous to an elaborate history control block/history data block (HCB/HDB).

SMS-originated call control (SOCC)

The SOCC provides message congestion control that is similar to automatic call gapping (ACG). However, call control is initiated by the service management system (SMS).

SN

send notification

SNM

send notification manager

SNP

service notification point

SOC

software optionality control

SOD

stringing of digits

SONET

synchronous optical network

SOR

Station Origination Restrictions

SORC

Station Origination Restrictions Controller

Special Delivery Service (SDS)

A feature that provides the caller with the option to invoke message delivery when the called party is busy or does not answer within an office-defined interval. The service is offered only to the subscribed originator and is requested directly from the end office (EO) where the call is originating. The actual voice message delivery is then offered from a Voice Message System (VMS) attached to the operating company's network.

speed call pause insertion (SCPAUSE)

An enhancement of the speed calling service that allows subscribers to insert pauses into the signaling digit string as they program a 24-digit maximum speed call number.

Speed Call User (SCU)

A feature that allows a subscriber to program a set of call-specified numbers using only one or two digits.

speed call validation (SCVAL)

An option assigned to a customer group that allows the call digits programmed in the speed call number to be validated.

Spontaneous Call Waiting Identification with Disposition (DSCWID)

A feature that allows the subscriber to receive calling party information during call waiting and provides the subscriber with a set of disposition options to treat incoming calls.

SPRING

Subscriber Programmable Ringing for Call Forwarding Remote Access (CFRA) on Residence Enhanced Services (RES)

SRS

Suppressed Ringing Service. *See also* Suppressed Ringing Access (SRA).

SSAC

Station-specific Authorization Codes

SSP

Service Switching Point

Standard Call Messenger (SCMSG)

A feature that automatically allows the caller to leave a message for the last party the caller has tried to reach.

station message waiting (MWT)

A feature that provides notification to users that a message has been queued against their directory number (DN). The feature permits users to dial an access code to call back the station user or attendant who activated the station

message waiting feature against their DN. MWT also allows the station user to activate station message waiting on another station.

Station Origination Restrictions (SOR)

A feature that determines if a call should be restricted. SOR restrictions fall into one of the following four categories: calls permitted based on network class of service (NCOS); only intragroup calls or calls on an exception list are allowed; only calls on the exception list are allowed; and no calls are allowed.

Station-specific Authorization Codes (SSAC)

A feature that provides the capability of limiting authorization code use to a specific station. This restriction increases security since the authorization code is linked to the idividual's station and cannot be used from just any location.

stored program control (SPC)

The control of an automatic switching arrangement in which call processing is determined by a program stored in an alterable memory.

SPC is also the control of a function by sequentially interpreting information stored in a memory whose structure is independent of the function to be performed.

STR

Send To Resource

subscription

trigger subscription

subsystem number (SSN)

The identification of a subsystem located at a Common Channel Signaling No. 7 (CCS7) point code that can supply data.

Super Conference (CNF30)

An option that extends the maximum number of conferees on an attendant setup or Meet-me Conference call from 6 to 10 or more (maximum of 30). *See also* Meet-me Conference (MMC), and Executive Conference (MMCONF150).

Suppressed Ringing Access (SRA)

A feature that provides the capability to access a telephone company's customer loop without audibly ringing the telephone set(s) on the customer's premises. The SRA feature functionality is provided as part of a networked Suppressed Ringing Service (SRS) whereby a suppressed ringing call can be originated from any point in the network to any customer's line network-wide.

Suppressed Ringing for Telemetry (UTS)

A feature, also known as the Utility Telemetry Service (UTS), that allows a utility access to an end-user's line for telemetry data purposes. Connections will only be made when the subscriber's line is idle. There is no disruption to the subscriber's usual activities. No power ringing is applied to the customer's line when a connection is made.

SUS

Suspend

SUS/RSUS

Suspend/Request Suspension

Suspend/Request Suspension (SUS/RSUS)

A feature that is assigned to a directory number (DN) appearance when the customer requests suspension of service. If SUS/RSUS is assigned, it is possible to specify the treatments received by calls that originate from and terminate to the customer line.

SVCGRP

Service Group

SWERR

software error

switch notification message

A switch call-related message that indicates that no service control point (SCP) or adjunct response message should be sent. *See also* switch request message, and notification.

switch request message

A switch call-related message that indicates that a service control point (SCP) or adjunct response message is required. *See also* request, and switch notification message.

synchronous optical network (SONET)

A standard for optical transport that defines optical carrier levels and their electrically equivalent synchronous transport signals. The SONET standard allows for a multivendor environment, for the positioning of the network for transport of new services, for synchronous networking, and for enhanced operation, administration, and maintenance (OAM).

The SONET standard is built around a 51.84-Mbit/s basic communications channel that is multiplexed upward. SONET network standards incorporate existing 1.544-Mbit/s DS-1 service and 44.6-Mbit/s DS-3 service as subsets of the 51.84-Mbit/s SONET basic channel. *See also* synchronous transport signal 1 (STS-1), and optical carrier 1 (OC-1).

T entries

T&C
time and charges

T1 timer

TAD
telephone answering device

TAFAS
Trunk Answer From Any Station

TAT
termination attempt

TBC
terminating basic call

TBCM
terminating basic call model

TCAPMON
transaction capabilities application part monitor

TCAPNM
Calling Name Delivery for Meridian Digital Centrex (MDC)

TCAP package
AIN service switching point (SSP) messages are passed between the SSP and the service control point (SCP) in transaction capabilities application part (TCAP) components (messages) in TCAP packages. The following TCAP package types are used by the AIN SSP: (1) query (Query with Permission To Release) initiates a transaction; (2) response package terminates a transaction; (3) conversation (Conversation with Permission to Release) maintains a transaction; (4) unidirectional package sends “message not associated with a transaction”; (5) abort package terminates a transaction abnormally.

TCP/IP
transmission control protocol/internet protocol

TDISC
IP disconnect timer

TDV

Toll Diversion

teen service

A feature that allows multiple directory numbers (DN) to be assigned to each single-party flat-rate line without the expense of additional line equipment. Different ringing patterns are used for each DN.

telco

telephone company

TERMATT

Termination Attempt trigger

TPE

trigger processing environment

terminal identifier (TID)

In DMS software, the TID uniquely identifies any entity on which a call can be originated or terminated. The TID is an identifier for message sources or destinations.

terminating basic call model (TBCM)

The type of basic call model (BCM) that represents call-processing logic related to the terminating call portion of a basic call. *See also* basic call model (BCM), call model, and originating basic call model (OBCM).

Terminating Billing Option—Hunt Groups (TRMBOPT)

An option that allows an automatic message accounting (AMA) record to be generated for each call that terminates on a member of a hunt group that has TRMBOPT assigned.

TID

terminal identifier

TN

termination notification

TNS

Transit Network Selection

TPE

trigger processing environment

TRA

Term Resource Available trigger

translation type (TT)

Directs a message to the appropriate global title translation (GTT) function, and in some cases provides the context for which the global title (GT) digits are to be interpreted.

translation verification (TRAVER)

A diagnostic tool that allows the operating company to access and simulate a telephone call in software and to display the tables and tuples used to establish the lines, trunks, or positions to which a call is routed.

transmission control protocol/internet protocol (TCP/IP)

A standard operating and interface protocol for local area networks (LAN) that can use devices from multiple vendors. It was first developed by the United States Defense Department for federal government LANs.

TRAVER

See translation verification (TRAVER).

trigger

A trigger defines the conditions that must be met for the service switching point (SSP) to send a query to the service control point (SCP), or adjunct. One or more types of triggers can occur at each trigger detection point (TDP).

trigger criteria

Trigger criteria defines the conditions used to determine whether a particular call will trigger. A trigger can contain criteria of one or more trigger criteria types. In order for a call to trigger, all trigger criteria must be met. There are three AIN criteria types: (1) Call Type, which specifies what kind of call may trigger; (2) Digits Dialed, which defines specific digits that cause triggering; and (3) Escape Code, which bypasses triggering.

For example, at the Information Analyzed point in a call, there may be a Customized Dialing Plan trigger whose criteria include Call Type and Digits Dialed. The operating company defines the values of Call Type and Digits Dialed.

triggering

The process whereby a call indicates that it requires advanced intelligent network (AIN) service(s).

trigger subscription

Triggers can be subscribed by the following: individual (line or trunk group), group (customer group), office, and directory number (DN).

trigger tables

Trigger tables store information about the advanced intelligent network (AIN) application, triggers, trigger detection points, trigger criteria, transport protocol, and service control point (SCP), or adjunct, routing.

TRMBOPT

Terminating Billing Option—Hunt Groups

Trunk Answer From Any Station (TAFAS)

An option that allows answering of incoming attendant-seeking calls from any station if all attendant positions are unattended. TAFAS dials an answer code in response to a common audible ringing device such as a bell or a buzzer.

TSP

Terminal Service Profile

TSTRC

STR-connection timer

tuple

A horizontal row in a data table.

TWW

two-way wide area telephone service (WATS)

U entries

U3WC

Usage Sensitive Three-way Calling

UASE

utility active service element

UCDLG

uniform call distribution (UCD) login key for UCD lines

UCDNSA

uniform call distribution (UCD) night service activate

UCDNSD

uniform call distribution (UCD) night service deactivate

UIF

user interface framework

unified processor (UP)

A processor that replaces the master processor (MP), the signaling processor (SP), and the memory cards associated with these processors. This replacement upgrades the remote switching center (RSC) to an ISDN remote switching center (RSCI).

Universal Access to Call Forwarding (CFXU)

A feature that provides universal access to call forwarding for telephones with a line class code of RES, RES-1FR, or RES-1MR.

Universal Voice Messaging (UVM)

A voice messaging service that is offered universally to residential and small business end-users through simplified dialing. The service is intended to be universal for several types of originating and terminating residential and business customers within an operating company's network.

UP

unified processor

UR

update request for trigger activation and deactivation

USA

user service agent

Usage Sensitive Three-way Calling (U3WC)

A feature that provides the Three-way Calling (3WC) feature on a pay-per-use basis. The U3WC user is charged each time the 3WC feature is requested instead of being charged a flat rate that is independent of the number of 3WC activations.

USD

utility services directory

user interface

The series of commands and responses used by operating company personnel to communicate with the DMS-100 Family switches. Communication takes place through the MAP terminal and other input/output devices (IOD). Formerly known as man-machine interface (MMI) or human-machine interface (HMI).

user service agent (USA)

A user service agent is an object that is encapsulated by an active service element's (ASE) service agent. It provides a focal point for managing user-side signaling and connection functions.

UTR
universal tone receiver

UTS
Suppressed Ringing for Telemetry

UVM
Universal Voice Messaging

UWATS
universal wide area telephone service

V entries

VAD
voice-activated dialing

VANC
voice-activated network control

VAPN
virtual access to private networks

VDN
virtual directory number

VDU
video display unit

VFGLA
virtual facility group look ahead

VMS
Voice Message System

VNS
Virtual Network Services

voice-activated dialing (VAD)
A service that allows a user to dial a call using voice only. VAD is an AIN 0.2 service driver and it may include the following capabilities: (1) speaker-dependent recognition of a name, which may be associated with any string of digits, including a vertical service code or a directory number; (2) speaker-independent recognition of digits. *See also* voice-activated network control (VANC).

voice-activated network control (VANC)

A service that allows a user to control the vertical features of a call by speaking a service name, which the network detects using speaker-independent recognition. There are two categories of VANC: initial VANC and extended VANC. *See also* initial voice-activated network control (VANC), extended voice-activated network control (VANC), and voice-activated dialing (VAD).

VSC

vertical service code

W entries

WAN

wide area network

wide area network (WAN)

A large-scale, high-speed communications network used primarily for interconnecting local area networks (LAN) located in different cities or nations. *See also* local area network (LAN).

DMS-100 Family

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