Critical Release Notice

Publication number: 297-2621-345
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The content of this customer NTP supports the SN06 (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.

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

Publication History

March 2004

Standard release 04.03 for software release SN06 (DMS).

Change of phone number from 1-800-684-2273 to 1-877-662-5669, Option 4 + 1.

297-2621-345

Digital Switching Systems

UCS DMS-250

SS7 RLT Feature Application Guide

UCS12   Standard 04.02   November 1999

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Digital Switching Systems

UCS DMS-250

SS7 RLT Feature Application Guide

Publication number: 297-2621-345
Product release: UCS12
Document release: Standard 04.02
Date: November 1999

Publication history

November 1999

Standard release 04.02 for UCS12 software release.

Changed values for the length of bytes column in Table 3-5 for the following FAR message parameters:

- Called Party Number
- Call Reference
- Calling Party Number
- Charge Number
- Generic Digits
- Operator Information

Changed values for the length of bytes column in Table 3-6 for the following FAA message parameters:

- Call Reference
- Generic Digits

Changed description for the 01001 code in Table 3–22 from treated call type to terminating switch ID and trunk group (BIN).

August 1999

Preliminary release 04.01 for UCS12 software release.

Updated Figure 5-2 to reflect the boomerang reorigination scenario without the context block. Also, rewrote the information that follows the lead-in text to Figure 5-2. Provided lead-in paragraphs for Figures 5-4 and 5-5.

Removed Enhanced Operator Position System (EOPS)-related data which included all of the chapter titled, “RLT calls scenarios for EOPS.”

> **ATTENTION**
> The UCS12 software release does not support EOPS functionality. The UCS software continues to support operator assisted calls through other platforms such as Enhanced Services Provider (ESP). Refer to Appendix A in the *UCS DMS-250 Feature Change Reference Guide* for additional information about EOPS removal.

Note: For UCS09 Standard release, this NTP was released with the 297-2643 suite of NTPs. This NTP was not upissued for the UCS11 software release.

November 1998

Standard release 03.03 for software release UCS09.

August 1998

Standard release 02.02 for software release UCS08.

May 1998

Preliminary release 02.01 for software release UCS08.

September 1997

Standard release 01.01 for software release UCS07.

Contents

About this document

> **ATTENTION**
> The UCS12 software release does not support Enhanced Operator Position System (EOPS) functionality. The UCS software continues to support operator assisted calls through other platforms such as Enhanced Services Provider (ESP). Refer to Appendix A in the *UCS DMS-250 Feature Change Reference Guide* for additional information about EOPS removal.

This publication describes the Release Link Trunk (RLT) functionality on the UCS DMS-250 switch. Although the switches provide RLT functionality, the services platforms initiate the RLT process. An Enhanced Services Provider (ESP) is an example of a services platform. An ESP is a software system that provides specialized switching, billing, and call processing features.

This publication includes data tables, office parameters, and commands that support RLT functionality. Although these items may pertain to other applications, this document addresses only those aspects that directly affect RLT functionality. For information on how the data tables, office parameters, and commands support other applications, see the appropriate publication listed in the section entitled *References in this document*.

Intended audience

This publication assists telecommunications engineers, technicians, switching system developers, operating company personnel, and anyone else who requires technical information on RLT functionality.

How this document is organized

The chapters in this publication provide the following information:

Chapter 1, RLT functionality

Chapter 1 introduces RLT, defines important terms, describes common call scenarios, and details important limitations and restrictions.

Chapter 2, RLT implementation

Chapter 2 assists you in filling data tables that RLT functionality requires; specifically, it defines office parameters that support RLT functionality.

Chapter 3, SS7 ISUP RLT messages and protocol

Chapter 3 provides technical specifications and technical details for the Signaling System 7 (SS7) Integrated Digital Services Network (ISDN) User Part (ISUP) messages and parameters that provide RLT functionality.

Chapter 4, Common RLT call scenarios

Chapter 4 summarizes the flow of SS7 ISUP messages between UCS DMS-250 switches and a services platform that supports RLT capabilities.

Chapter 5, RLT call scenarios for ESP

Chapter 5 summarizes the flow of SS7 ISUP messages between a bridging UCS DMS-250 switch, a remote UCS DMS-250 switch, and an Enhanced Services Provider (ESP).

Chapter 6, RLT call scenarios for non-operator calls

Chapter 6 summarizes the flow of SS7 ISUP messages between a bridging UCS DMS-250 switch, a remote UCS DMS-250 switch, and an Enhanced Services Provider (ESP) for non-operator calls.

Chapter 7, Billing for RLT calls

Chapter 7 describes how UCS DMS-250 switches generate billing records for RLT calls.

Chapter 8, Common RLT billing scenarios

Chapter 8 describes how an ESP can override UCS DMS-250 switches when generating billing records for RLT calls.

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 first software release cycle is 01.02.

This document is written for all UCS DMS-250 Family offices. More than one version of this document may exist. To determine whether you have the correct version of this document for the software in your office, check the release information in the *UCS DMS-250 Master Index of Publications*. This index also describes how documentation for your product is organized.

References in this document

This publication includes references to the following documents:

- *UCS DMS-250 Billing Records Application Guide*, 297-2621-395
- *UCS DMS-250 Data Schema Reference Manual*, 297-2621-851
- *UCS DMS-250 Feature Change Reference Guide*, 297-2621-050
- *UCS DMS-250 Master Index of Publications*, 297-2621-001

Other documents that contain information that relates to RLT functionality include the following:

- *UCS DMS-250 Integrated Services Digital Network (ISDN) Reference Guide*, 297-2621-106
- *UCS DMS-250 Office Parameters Reference Manual*, 297-2621-855

RLT functionality

This chapter describes the Release Link Trunk (RLT) functionality for the UCS DMS-250 switch.

RLT capability for SS7 trunks

Using elements of a Signaling System 7 (SS7) Integrated Services Digital Network (ISDN) User Part (ISUP), an SS7 RLT connects a remote UCS DMS-250 switch to a services platform such as an Enhanced Services Provider (ESP). An ESP consists of a software system that provides specialized switching, billing, and call processing features.

ATTENTION

The UCS12 software release does not support Enhanced Operator Position System (EOPS) functionality. The UCS software continues to support operator assisted calls through other platforms such as Enhanced Services Provider (ESP). Refer to Appendix A in the *UCS DMS-250 Feature Change Reference Guide* for additional information about EOPS removal.

Although the UCS DMS-250 switches provide RLT capability, the services platform initiates RLT. RLT functionality allows a UCS DMS-250 switch to release an ISUP inter-machine trunk (IMT) while the same or another UCS DMS-250 switch bridges one call's originator or terminator to a second call's terminator. After RLT, the ESP is available for other calls. RLT functionality increases a UCS DMS-250 switch's traffic handling capacity and saves resources during call routing. Without RLT, the ESP and the trunks involved must maintain at least one call connection until a call is over.

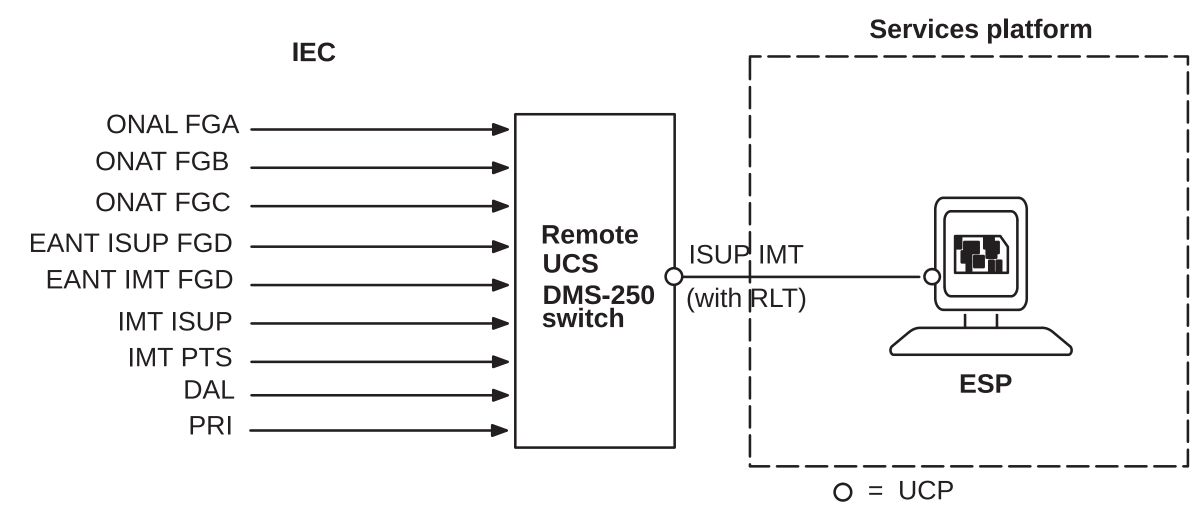
SS7 RLT functionality is available between the following entities:

- two or more UCS DMS-250 switches
- a UCS DMS-250 switch and an ESP

UCS DMS-250 switches with SS7 RLT functionality also generate billing records for RLT calls. For information on billing records, refer the *UCS DMS-250 Billing Records Application Guide*.

Figure 1-1 shows the trunk interworkings for the remote UCS DMS-250 switch and its connection to the ESP services platform. This figure indicates the types of trunk group originations for calls entering the network. These trunks and connections use the Universal Carrier Protocol (UCP).

Figure 1-1
ISUP trunk interworkings for RLT at an ESP



Note: IMT (ISUP) and IMT (PTS) agencies do not allow reorigination with RLT functionality

Protocols that support RLT capabilities

The Universal Carrier Protocol (UCP) provides SS7-based communication between the remote UCS DMS-250 switch and the services platform.

Explanations for important RLT terms

The following subsections define important RLT terms that this publication uses frequently.

Bridging and the bridging switch

When a switch bridges a call for RLT functionality, it connects the originating or terminating trunk of one call to the terminating trunk of a second call. The *bridging* UCS DMS-250 switch bridges the call and maintains the call connection. Any switch with RLT capability, including the remote switch, can bridge calls. A switch bridges calls only when it cannot remove itself from the call connection by passing the bridge request to another switch. To bridge calls, a switch between the bridging and service platform switches must have RLT capability.

Originating switch, terminating switch, and call legs

A switch that connects to the calling party is an *originating* switch. A switch that connects to the called party is a *terminating* switch. A call's first leg connects the originating switch to ESP. A call's second leg connects the ESP to the terminating switch. For an ESP call, the services platform makes a call to the terminating switch before it connects a call to the originating switch, establishing the second call leg before the first call leg. A call's point of connection, not the order in which the network establishes a call, defines it as a first or second leg.

The switching network passes Facility Accept, Facility Request, and Facility Reject messages over the trunk circuit associated with the first leg of a call. An ESP, or a third party platform, initiates the second leg of a call. The order in which an ESP establishes call legs does not affect RLT functionality. Figure 1-2 shows an example of call legs in an RLT scenario.

Normal and boomerang reorigination

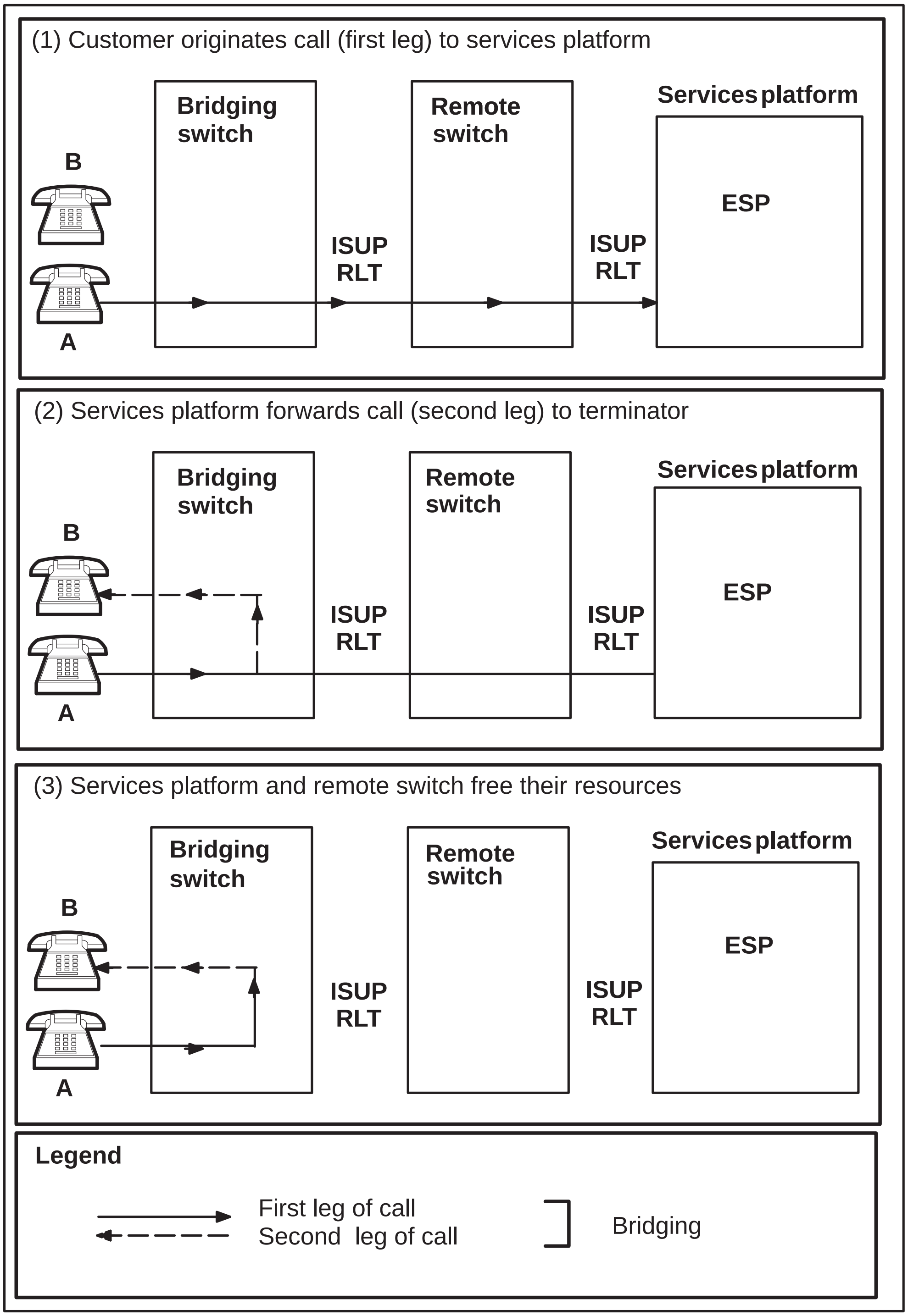
UCS DMS-250 switches allow *normal reorigination*, by providing a dial tone to the calling party so that another call can be made by entering only a new address. The UCS DMS-250 switches also allow *boomerang reorigination*, by using the original dialed number to route the reoriginated call instead of prompting for a new address (as is the case in normal reorigination). Only ESP services support boomerang reorigination, such as returning to the main menu of a voice response system.

Important call types

A *non-operator* call occurs when a UCS DMS-250 switch routes a call without a 0+ or 0– address to a services platform. An *operator services* call occurs when a UCS DMS-250 switch routes a call with a 0+ or 0– address to an operator. An *operator-initiated* call occurs when the services platform initiates a call to both call parties, creating both the first and second call legs.

Note: If the office parameter field ALL_RLT_OPR_CALLS is Y, then all calls that terminate to an RLT trunk are considered operator calls.

Figure 1-2
Example of call legs



Common RLT call scenarios

The following scenarios are the most common that involve RLT functionality. For details about these call scenarios, refer to Chapter 4, “Common RLT call scenarios.”

ESP redirect and transfer scenario

In this scenario, the ESP transfers the call to its destination and requests RLT. After the appropriate switch bridges the call, the RLT capability frees the services platform and the remote UCS DMS-250 switch.

Third-party interaction scenario

In this scenario, a call requires that the ESP place a three-way call, such as a third-party call, collect call, or person-to-person call. When the parties are in conference, the ESP requests RLT. After the appropriate switch bridges the call, the RLT capability frees ESP and the remote UCS DMS-250 switch, dropping the ESP out of the call.

ESP-initiated call back scenario

In this scenario, the ESP disconnects a call without connecting it to a terminator. A services platform disconnects a call if the terminator is not available. Later, the ESP initiates a call to the first call’s terminator, then initiates a second call to the first call’s originator, and requests RLT. After the appropriate switch bridges the call, the RLT capability frees the services platform and the remote UCS DMS-250 switch. With this scenario, the second leg of the RLT call is set up before the first call leg.

Billing descriptions for common RLT call scenarios

Using the RLT functionality, UCS DMS-250 switches can generate an operator service record (OSR), a call detail record (CDR), or both for RLT calls. The bridging switch produces an OSR and CDR pair for calls to the services platform. Refer to Chapter 7, “Billing for RLT calls,” for more details. For detailed information on billing records and OSR and CDR pair formats, refer to the *UCS DMS-250 Billing Records Application Guide*.

A UCS DMS-250 bridging switch generates an OSR and CDR pair after the call is completed. A Facility Request (FAR) message that requests a bridge might not contain a Calling Party Number parameter or a Called Party Number parameter. In either case, the bridging switch pulls billing information from the call’s CDR and places the information in an OSR.

If bridging is unsuccessful at all switches involved in the call, only the services platform generates the OSR and CDR. These records contain current information for operator services calls.

To generate an OSR, the configuration of any UCS DMS-250 bridging switch must include the operator recording units and UCS DMS-250 recording units. When a switch that bridges an RLT call lacks operator recording units, it generates an appropriate log report.

Office parameters for RLT billing

The UCS DMS-250 switches need the following office parameters to generate an OSR, a CDR, or both:

- The NO_OF_EOPS_REC_UNITS office parameter in table OFCENG allocates the number of operator recording units that a switch has available.
- The CDR_FOR_ISUP office parameter in table OFCVAR controls billing generation. If this parameter is Y, the bridging switch can generate a CDR and OSR pair. If this parameter is N, the bridging switch cannot generate a CDR and OSR pair. This office parameter is active only when a call originates on an ISUP IMT, and only when the CDR_FOR_IMT office parameter is inactive.
- The CDR_UNAVAIL_BLOCK office parameter in table OFCVAR allows a switch to block a call that does not provide extension blocks. If this parameter is Y, the switch applies NO_SERVICE_CRKT (NOSC) treatments to block calls with no extension blocks. If this parameter is N, the switch does not block calls that do not have extension blocks. This parameter does not block call reoriginations.
- The OSR_FOR_ISUP office parameter in table OFCVAR also controls billing generation. If this parameter is Y, the bridging switch can generate a CDR and OSR pair. If this parameter is N, the bridging switch cannot generate a CDR and OSR pair. This office parameter is active only when a call originates on an ISUP IMT, and only when the CDR_FOR_IMT office parameter is inactive.
- The RLT_FIRST_ANM_BILLING office parameter in table OFCVAR controls whether or not billing for RLT calls begins with the first ANM message received or the last ANM message received. If this parameter is Y, billing begins from the receipt of the first ANM message. If this parameter is N, billing begins from the receipt of the last ANM message.

Dependencies

To support RLT functionality, a UCS DMS-250 switch does not require any special hardware. However, all switches that support RLT functionality must have the software shown in Table 1-1.

Table 1-1
RLT Software Requirements

UCS06 SOC order code	UCS06 SOC option name
URLT0001	URLT enhanced network server
URLT0002	URLT enhanced reorigination
URLT0003	URLT nonzero RLT

RLT support capabilities

UCS DMS-250 switches with RLT functionality support reorigination on the following agencies:

- dedicated access line (DAL)
- FGA
- FGB
- FGC
- per-trunk signaling (PTS) FGD
- ISUP FGD

Note: UCS DMS-250 switches support RLT functionality only on ISUP IMTs with the UCP for which table TRKGRP contains an active RLT option.

UCS DMS-250 switches with RLT functionality support the following call classifications:

- Calls not designated as operator-assisted (OA) can reoriginate to the services platform.
- RLT functionality allows reorigination only for the following station-to-station or person-to-person, non-collect billing types:
  - — calling card
  - — credit card
  - — automatic numbering identification (ANI)
  - — authorization code

Limitations and restrictions

Trunk and protocol compatibility

When a call originates on an ISUP IMT with RLT capability and terminates at either an ISUP FGD trunk or an ISUP IMT that lacks RLT capability, the UCS DMS-250 switches do not pass parameters that are specific to RLT.

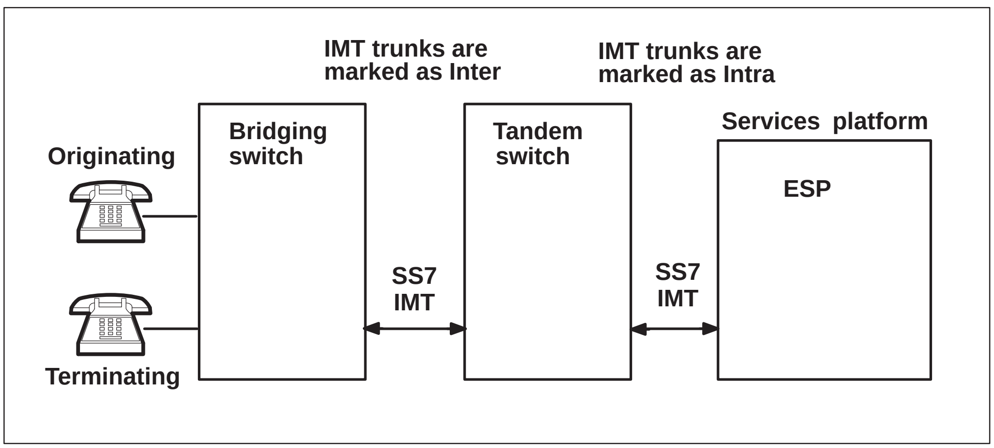
Reorigination

The following describes the reorigination functionality of the RLT:

- The Initial Address Message (IAM) delivered on a redirected boomerang call will contain the same optional parameters as the original IAM delivered on the first call, assuming that no datafill changes have been made between the first call and the boomerang reoriginated call.
- The IAM delivered on a third party boomerang is rebuilt at the bridging switch with the current information available. Therefore, the IAM may be different from the IAM delivered on the first call.
- RLT does not allow reorigination in the following circumstances:
  - — third-party billing verification calls
  - — calls involving recall to the services platform (this includes calls requesting time and charges)
  - — calls from a prison
  - — 911 calls
  - — coin calls
  - — calls in a queue for an operator position
  - — calls originating from an ESP
- The Reorigination Type field in the Operation Information parameter of the FAR message is found in previous UCS software releases. In those releases, value 11 of Reorigination Type was spare and treated as no reorigination allowed. Value 11 means looking at the Reorigination; therefore, reorigination may not be blocked as in the previous releases and it is assumed that the data in the reorigination fields are correct.
  - — If an ESP sends a FAR message with value 11 in Reorigination Type, the receiving switch may allocate reorigination resources based on the Reorigination Fields instead of datafill provisioned in the switch.
  - — If these values are sent to UCS DMS-250 switches with previous software releases with the FAR messages, it causes blocking on reorigination.
- The REORIG_FOR_OPERATOR_SERVICES office parameter in table OFCVAR is not changed in this release and continues to enable or disable operator services reorigination on the Originating switch.

- Standard non-operator RLT calls are not effected by the existing REORIG_FOR_OPERATOR_SERVICES office parameter if the existing ALL_RLT_OPR_CALLS office parameter is N.
- For non-AXXESS operator calls, the ability to enable reorigination is limited to AUTO/MANUAL capability, and boomerang reorigination is not supported for direct non-AXXESS operator calls.
- The Bridge Reorig Control field in the Operator Information of a FAR is always set to N by the services platform.
- The reorigination fields in the Bridging, Redirecting or Reorigination FAR messages override the value in the RECALLDT field of table TRKGRP.
- For ESP-initiated callback scenarios, if RLT trunks are involved and the Originating switch is not the Bridging switch, the functionality provided by this release is supported, as shown in Fig 1-3.

Figure 1-3
Message flow for ESP-initiated call back



Using RLT on inter-network IMT

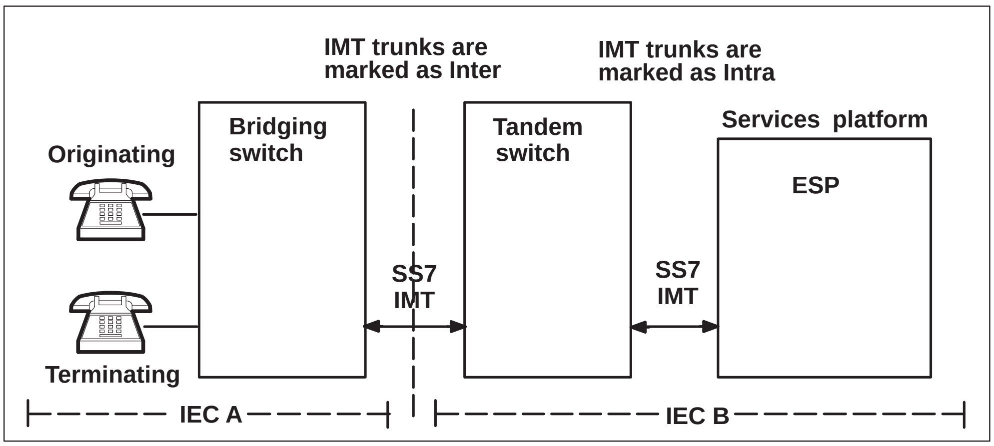
Using RLT functionality on inter-network IMTs changes some of the interactions between interexchange carriers (IECs).

- When using RLT between IECs, UCS DMS-250 switches can allow reorigination based on the billing information collected and validated at the services platform.

  For example, the services platform sends this billing information to the bridging switch over an inter-network IMT as shown in Figure 1-4. This switch does not validate the billing information, but can still allow reorigination, relying on the correctness of the billing information from the services platform. The bridging switch uses this billing information to populate its CDR and OSR.

- Inter-network IMTs can provide Universal Access (UA) services as shown in Figure 1-4. If an inter-network IMT is connected to the remote switch and the call is a UA call, then if the call terminates to a services platform, the services platform could bridge the call back to the remote switch and lose the billing information related to the UA call. The bridged call would continue with billing information sent from the ESP, not the UA billing information collected on the remote switch.
- When using RLT between IEC networks, the functionality can result in a switch from one IEC network being able to indicate which operator queue to route a call to in another IEC network. This could result in cases where the datafill on a remote IEC switch in the bridging switch network does not match the operator queue configuration on a services platform switch in the remote switch network as shown in Figure 1-5.

Figure 1-4
Message flow for RLT between IECs



Special RLT conditions

The following conditions affect RLT reorigination functionality:

- RLT does not allow reorigination for operator service calls until the services platform extends the call and releases it from the services platform.
- RLT functionality prevents the switches of operator calls from translating and routing the reoriginated call. This prevention is based upon the original dialed number in the event that the switches have not generated a CDR for the current call. The switches apply a NO_SERVICE_CRKT (NOSC) treatment for the call, regardless of the datafill in the CDR_UNAVAIL_BLOCK office parameter in table OFCENG.
- OSRs for RLT calls are generated by bridging switches, including calls that are not operator-assisted.

- ANM defines the field REORIGINATION TYPE in the Operator Information parameter. The Address Complete Message (ACM), facility accept message, and Facility Request (FAR) message do not define this field.
- IAM does not affect the UCS DMS-250 switch based upon the field REORIGINATED CALL in the Transit Network Selector (TNS). The switch transfers the value of REORIGINATION CALL from the received IAM to the dispatched IAM when both the originator and terminator are SS7 trunks.

  Note: Only ESPs with proper programming use the reoriginated call field in the TNS.

- If the services platform allows boomerang reorigination and the PARMBLK field in table TRKGRP is set to Y on any of the SS7 RLT IMTs that the call is routed over, the services platform blocks the Generic Digits and TNS parameters in the outgoing IAM message and does not send a CALLID to the ESP.
- RLT does not require switches to segregate 1+ and operator service traffic onto different trunk groups.
- Typically, an RLT call involves only the two trunks between the services platform and the remote switches while a services platform interacts with the called party. If bridging fails, however, both trunks maintain call connections until the call is over.
- For ESP-initiated callback calls, a switch must answer the first call leg before it accepts a FAR message that requests bridging.
- RLT does not support the use of inward completion codes for directory assistance.
- When calls terminate to ISUP IMTs with RLT capability, the switches in the network disable call reorigination. They can detect reoriginations only if the originating switch is the bridging switch, only after bridging, and only after it receives an ANM that indicates the type of reorigination. If any other switch performs bridging (or if the switches do not bridge the call at all), the network cannot reoriginate the call.

  Note: This restriction only applies if the office parameter field ALL_RLT_OPR_CALLS is Y.

RLT implementation

Because UCS DMS-250 data tables are interactive, they must be datafilled in a specific order. This chapter presents the data tables and office parameters required for Release Link Trunk (RLT) functionality.

Data tables and datafill for RLT functionality

The following tables contain datafill for the RLT functionality:

- TRKGRP (trunk group)
- TRKSGRP (trunk subgroup)

TRKGRP (IMT trunk group type)

The following fields in table TRKGRP relate specifically to RLT:

- ISUPIDX
- CUSTOMER
- OPTIONS

Functional description

Inter-machine trunk (IMT) groups connect the UCS DMS-250 switches to other interexchange carrier (IEC) switches in the network. The UCS DMS-250 system supports originating, terminating, and two-way access over IMTs. Subscribers can originate IMT calls on the UCS DMS-250 switch and allow compatibility between the customer network and ETN switches for private network configurations.

Datafill sequence and implications

Operating company personnel must datafill the CLLI and CLLICDR tables before table TRKGRP.

Table 2-1 lists the datafill that RLT functionality requires in table TRKGRP. For additional datafill information, see the *UCS DMS-250 Data Schema Reference Manual*.

Table 2-1
RLT-related datafill for table TRKGRP (IMT trunk group type)

Field	Subfield or refinement	Entry	Explanation and action
	ISUPIDX	UCS2EAEO, NILIDX, UCS2MCI, UCS2USP, or UCS2UCS	ISUPIDX. This field specifies the interworking between the different network domains. This field's valid entries are: • UCS2EAEO. ISUP between a UCS DMS-250 switch and an Equal Access End Office (EAEO) of an LEC. • NILIDX. ISUP calls cannot go through when datafill includes NILIDX. Trunks that are not ISUP IMTs use this field. • UCS2MCI. ISUP between a UCS and an MCI DMS-250 switch. • UCS2USP. ISUP between a UCS DMS-250 switch and a USSPRINT DMS-250 switch. • UCS2UCS. ISUP between two UCS DMS-250 switches.
	CUSTOMER	UCSUST, UCS	CUSTOMER. Depending on which customer type is selected, the technician is prompted with the appropriate fields for that customer. This field indicates the operating company's dialing plan. *UCSUST is required for RLT.*
	OPTIONS		OPTIONS. This field has several optional subfields. The dollar sign ($) indicates the end of the options.
		RLT	RELEASE LINK TRUNK. Enter RLT to indicate which trunk supports the release trunk feature; otherwise, omit.
		VERSION V1 PARMBLK	PARAMETER BLOCK is a Y or N field within the RLT option and is not a separate option.
		LNPRLT	LOCAL NUMBER PORTABILITY is an option added to inter and intra IMTs.

Datafill example

Figure 2-1 illustrates a sample datafill for the table TRKGRP (IMT trunk group type).

Figure 2-1
MAP display example for table TRKGRP (IMT trunk group type)

```
    GRPKEY
GRPTYP  TRAFSNO
            PADGRP  NCCLS                       GRPINFO
________________________________________________________
  IMT761C7P00
        IMT     40
                  NPDGP NCIM    UCSUST      0
 2W         IMT                 MIDL
                    16  7  16  16
UCS2UCS   NIL C N  NONE 4  ALWAYS  I3PA 111 0  INTRA N
VOICE_DATA
(  OHQ ) ( OHQTERM ) (ISDNXFER ) ( ID24_ON ) ( RLT V 1 N )$
```

TRKSGRP

Table TRKSGRP lists the supplementary information for each subgroup assigned to one of the trunk groups listed in table TRKGRP. The field that relates specifically to RLT is the UCP PROTOCOL field, as shown in Table 2-2. For additional datafill information, see the *UCS DMS-250 Data Schema Reference Manual*.

Table 2-2
RLT-related datafill for table TRKSGRP

Field	Subfield or refinement	Entry	Explanation and action
PROTOCOL		UCP	PROTOCOL. Enter UCP as the signaling protocol type to provide connectivity. Other protocols do not support RLT functionality.

Datafill example

Figure 2-2 illustrates a sample datafill for the table TRKSGRP.

Figure 2-2
MAP display example for table TRKSGRP

```
         SGRPKEY     CARDCODE
SGRPVAR                                    SGRPVAR
________________________________________________________
  IMT761C71P00 0 DS1SIG
   C7UP
2W N N UNEQ ACTIVEA UCP THRH 100 DMSNODE $ NIL CIC
```

Office parameters

The office parameters described in the following paragraphs must contain datafill for RLT.

ALL_RLT_OPR_CALLS

Parameter name

All Release Link Trunk (RLT) Operator Calls

Functional description

The ALL_RLT_OPR_CALLS office parameter in table OFCVAR controls whether or not the UCS DMS-250 switches treat non-operator calls made over RLT trunks as operator services calls.

Provisioning rules

Not applicable

Range information

The range of values is Y or N. When the value is Y, the switches treat non-operator calls made over RLT trunks as operator service calls. If the value is N, the switches treat the calls as normal non-operator calls.

Minimum	Maximum	Default
		Y

Note: 0+/0– calls are still treated as operator services calls.

Activation

Immediate

Dependencies
Not applicable

Consequences
Not applicable

Verification
Not applicable

Memory requirements
This parameter has no memory impact.

Dump and restore rules
Copy the existing value of this parameter or consult Nortel Networks Customer Engineering.

CDR_FOR_ISUP

Parameter name
Call Detail Record (CDR) For Integrated Services Digital Network (ISDN) User Part (ISUP)

Functional description
The CDR_FOR_ISUP office parameter in table OFCVAR controls how a switch generates billing for calls from ISUP IMTs.

This parameter works only when the CDR_FOR_IMT parameter is inactive.

Provisioning rules
Not applicable

Range information
The range of values is Y or N. When the value is Y, the switch produces billing records for all originating ISUP IMT calls. When the value is N, the switch does not produce billing records for originating ISUP IMT calls.

Minimum	Maximum	Default
		N

Activation
Immediate

Dependencies
Not applicable

Consequences
Not applicable

Verification
Not applicable

Memory requirements
This parameter has no memory impact.

Dump and restore rules
Copy the existing value of this parameter or consult Nortel Networks Customer Engineering.

NO_OF_EOPS_REC_UNITS

Parameter name
Number of Enhanced Operator Position System (EOPS) Recording Units

Functional description
The NO_OF_EOPS_REC_UNITS office parameter in table OFCENG allocates the number of operator recording units that a switch has available.

Provisioning rules
Set this parameter to a value that reflects the maximum number of expected operator type calls up at any one time. The provisioning rules for the operator RU is as follows:

$$\text{RLT} \times (3600 \text{ sec} \div \text{AWT sec}) = \text{A}$$

$$\text{A} \times (\text{Avg } 250 \text{ min} \div 60 \text{ min}) + \text{RLT} = \text{Operator RU}$$

where:

RLT represents the number of Release Link Trunks connected to the switch.

AWT represents the average wait time of the operator.

A represents the total calls per hour.

AVG 250 represents the average call-hold time on the switch.

Range information

Minimum	Maximum	Default
0	32767	100

Activation
Immediate for increases in parameter values. Cold restart for decreases in parameter values

Dependencies
Not applicable

Consequences
Not applicable

Verification
Not applicable

Memory requirements
This parameter has no memory impact.

Dump and restore rules
Copy the existing value of this parameter or consult Nortel Networks Customer Engineering.

CDR_UNAVAIL_BLOCK

Parameter name
Call Detail Record (CDR) Unavailable Block

Functional description
The CDR_UNAVAIL_BLOCK office parameter in table OFCVAR allows a switch to block a call that does not provide extension blocks. This parameter does not block call reoriginations.

Provisioning rules
Not applicable

Range information

The range of values is Y or N. If the value is Y, the switch applies NO_SERVICE_CRKT (NOSC) treatments to block calls with no extension blocks. If the value is N, the switch does not block calls that do not have extension blocks.

Minimum	Maximum	Default
		Y

Activation

Immediate

Dependencies

Not applicable

Consequences

If Y, could lead to blocked calls.

Verification

Not applicable

Memory requirements

This parameter has no memory impact.

Dump and restore rules

Copy the existing value of this parameter.

OSR_FOR_ISUP

Parameter name

Operator Service Record (OSR) For Integrated Services Digital Network User Part (ISUP)

Functional description

The OSR_FOR_ISUP office parameter in table OFCVAR controls how switch generates billing for calls from ISUP IMTs.

This parameter works only when the CDR_FOR_IMT parameter is inactive.

Note: To support this parameter, the switch must have the Enhanced Tandem Services Software Load (PCL).

Provisioning rules
Not applicable

Range information
The range of values is Y or N. When the value is Y, the switch produces billing records for all originating ISUP IMT calls. When the value is N, the switch does not produce billing records for originating ISUP IMT calls.

Minimum	Maximum	Default
		N

Activation
Immediate

Dependencies
Not applicable

Consequences
Not applicable

Verification
Not applicable

Memory requirements
This parameter has no memory impact.

Dump and restore rules
Copy the existing value of this parameter or consult Nortel Networks Customer Engineering.

REORIG_FLEXDIAL_INDEX

Parameter name
Reorigination Flexdial index

Functional description
This parameter specifies the default index to table FLEXDIAL. For the reorigination call using an AXXESS agent, if the index to table FLEXDIAL is identified, this default value is used.

Provisioning rules
Not applicable

Range information
NIL

Activation
Immediate

Dependencies
Not applicable

Consequences
Not applicable

Verification
Not applicable

Memory requirements
This parameter has no memory impact.

Dump and restore rules
Not applicable

REORIG_MSGCTR_INDEX

Parameter name
Reorigination message center index

Functional description
This parameter specifies the default index to table MSGCTR. For the reorigination call using an AXXESS agent, if the index to table MSGCTR is identified, this default value is used.

Provisioning rules
Not applicable

Range information
The range of values is 0 to 16777215. When the value is 0, the feature is deactivated.

Minimum	Maximum	Default
		0

Activation
Immediate

Dependencies
Not applicable

Consequences
Not applicable

Verification
Not applicable

Memory requirements
This parameter has no memory impact.

Dump and restore rules
Not applicable

REORIG_FOR_OPERATOR_SERVICES

Parameter name
Reorigination For Operator Services

Functional description
The REORIG_FOR_OPERATOR_SERVICES office parameter in table OFCVAR controls whether a switch supports operator services reoriginations.

Note 1: To support this parameter, the UCS DMS-250 switch must have the Enhanced Tandem Services Base software load (PCL).

Note 2: When the ALL_RLT_OPR_CALLS office parameter in table OFCVAR is set to Y, the switch treats non–operator RLT calls as operator services calls and then restricts these calls at bridging using REORIG_FOR OPERATOR_SERVICES.

Provisioning rules
Not applicable

Range information

The range of values is Y or N. If the value is Y, the switch supports operator services reorigination.

Minimum	Maximum	Default
		N

Activation

Immediate

Dependencies

Not applicable

Consequences

Not applicable

Verification

Not applicable

Memory requirements

This parameter has no memory impact.

Dump and restore rules

Copy the existing value of this parameter or consult Nortel Networks Customer Engineering.

RLT_EOPS_SWITCH

Parameter name

Release Link Trunk (RLT) Enhanced Operator Position System (EOPS) Switch

Note: The UCS12 software release does not support EOPS functionality. The UCS software continues to support operator assisted calls through other platforms such as Enhanced Services Provider (ESP).

Functional description

The RLT_EOPS_SWITCH office parameter identifies the switch as a services platform that has RLT capability.

Provisioning rules

Not applicable

Range information
The range of values is Y or N. When the value is N, the parameter is inactive and the switches cannot use it.

Minimum	Maximum	Default
		N

Activation
Immediate

Dependencies
Not applicable

Consequences
Not applicable

Verification
Not applicable

Memory requirements
This parameter has no memory impact.

Dump and restore rules
Copy the existing value of this parameter or consult Nortel Networks Customer Engineering.

RLT_FIRST_ANM_BILLING

Parameter name
Release Link Trunk (RLT) First Answer Message Billing

Functional description
The RLT_FIRST_ANM_BILLING office parameter identifies whether the UCS DMS-250 switch begins billing for RLT calls with the first ANM message received or the last ANM message received.

Provisioning rules
Not applicable

Range information

The range of values is Y or N. When the value is Y, the first ANM will be used. If the value is N, the last ANM will be used.

Minimum	Maximum	Default
		N

Activation

Immediate

Dependencies

Not applicable

Consequences

Not applicable

Verification

If this parameter is Y, make a call to an ESP with multiple redirections and verify that billing begins with the first ANM message.

Memory requirements

This parameter has no memory impact.

Dump and restore rules

Copy the existing value of this parameter or consult Nortel Networks Customer Engineering.

RLT_REDIRECT

Parameter name

Release Link Trunk (RLT) Redirect

Functional description

The RLT_REDIRECT office parameter identifies whether or not the services platform can redirect RLT calls.

Provisioning rules

Not applicable

Range information

The range of values is Y or N. When the value is N, the services platform cannot redirect RLT calls. When the value is Y, the services platform can redirect RLT calls.

Minimum	Maximum	Default
		N

Activation

Immediate

Dependencies

Not applicable

Consequences

Not applicable

Verification

If this parameter is set to Y, make an operator-assisted call over an RLT trunk to a services platform and verify that the call is redirected over that same trunk.

Memory requirements

This parameter has no memory impact.

Dump and restore rules

Copy the existing value of this parameter or consult Nortel Networks Customer Engineering.

SS7 ISUP RLT messages and protocol

This chapter describes the Signaling System 7 (SS7) Integrated Digital Services Network (ISDN) User Part (ISUP) Release Link Trunk (RLT) messages that provide connectivity between switching elements in a network. It describes each ISUP message along with the parameters that these messages use.

This chapter defines ISUP message formats, ISUP messaging requirements, and ISUP message parameters for RLT.

Note: These parameters are correct for RLT functionality only.

SS7 ISUP message formats and messaging requirements

This section provides SS7 ISUP message information, describing the format, encoding, and RLT application of each message. Table 3-1 lists the messages. This section does not present all the SS7 messages that the UCS DMS-250 switch supports; it describes only the basic set of messages that affect RLT.

For descriptions of specific RLT events and their messaging requirements, see the call examples in Chapter 4, “Common RLT call scenarios,” and Chapter 5, “RLT call scenarios for ESP.”

Table 3-1
SS7 ISUP RLT message summary

Symbol	Hex code	Message name
IAM	01	Initial Address Message
ACM	06	Address Complete Message
ANM	09	Answer Message
FAR	1F	Facility Request message (Note)
FAA	20	Facility Accept message (Note)

—continued—

Table 3-1
SS7 ISUP RLT message summary (continued)

Symbol	Hex code	Message name
FRJ	21	Facility Reject message (Note)
REL	0C	Release message
RLC	10	Release Complete message

Note: The Facility Request (FAR), Facility Accept (FAA), and the Facility Reject (FRJ) messages are specific to the implementation of RLT. The UCS DMS-250 switch does not require these messages to perform basic call setup using the Universal Carrier Protocol (UCP).

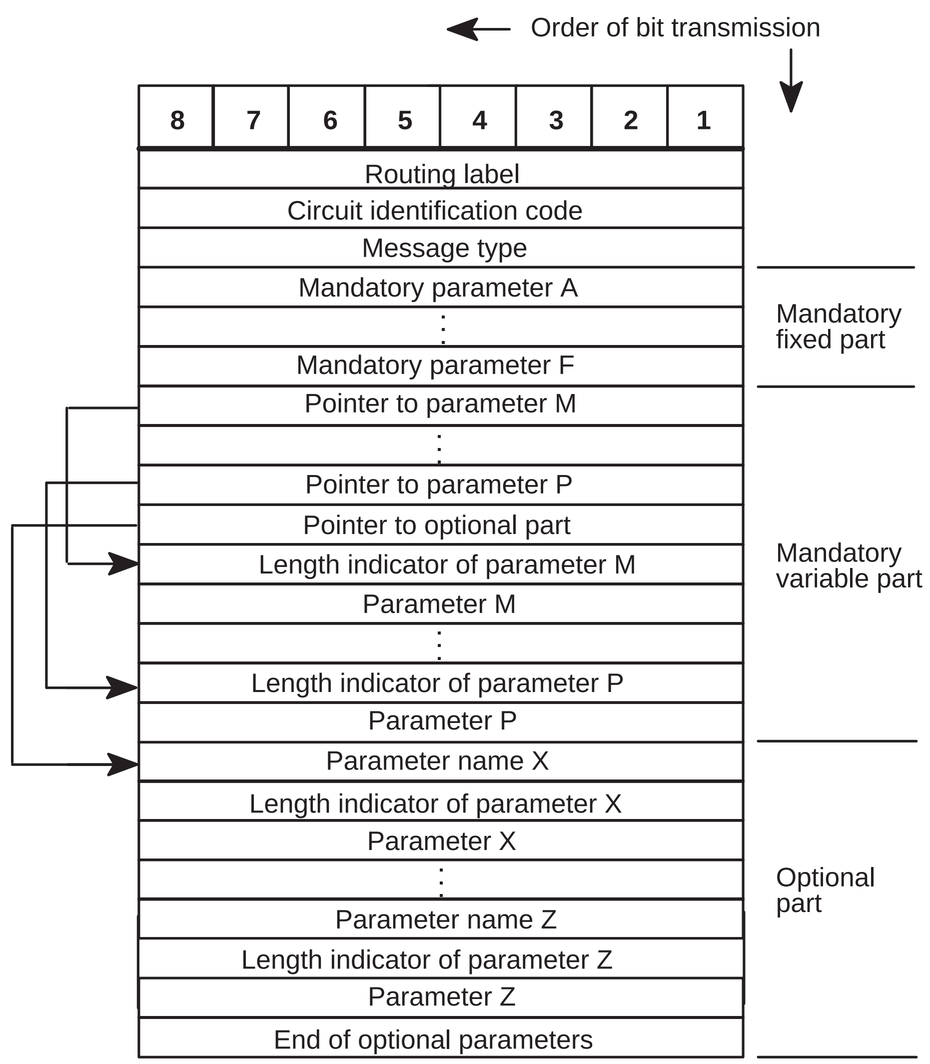
—end—

General message information

In general, the ISUP messages implement RLT requirements. The ISUP messages for the UCS DMS-250 switching environment allow signaling to either request call-related information or invoke customer or network services. These messages also transfer user information through the network.

This chapter presents the ISUP RLT messages and parameters graphically in the format defined in Figure 3-1.

Figure 3-1
ISUP message format



Understanding ISUP message formats

The type or length column in each of the tables in the following sections includes a key that defines the length of the ISUP message parameter.

The three possible parameter codes include the following:

- F = Fixed-length parameters (mandatory)
- V = Variable-length parameters (mandatory)
- O = Fixed or variable length parameters (optional)

Each message description includes an abbreviation (for example, IAM for Initial Address Message) after the full message name heading. Each description also includes a hexadecimal code and an equivalent binary code for the message.

Directions of messages

Some of the message descriptions include the terms *forward* and *backward* to indicate the direction in which the switches pass the messages. The term *forward* indicates that the switches send the message toward the call's terminator, the called party. The term *backward* indicates that the switches send the message toward the call's originator, the calling party. The switches pass most messages only forward or backward, but can pass Release (REL) and Release Complete (RLC) messages in either direction.

Mandatory and optional status of ISUP message parameters

Some parameters for ISUP messages are mandatory. Some ISUP messages also use optional parameters, depending on the message's specific function. Each parameter description specifies the value for the length in bytes, defined as follows:

- Fixed-length parameters specify the length, in bytes, of the parameter data.
- Variable-length parameters specify the sum, in bytes, of the length of the length indicator (1 byte) plus the length of the parameter content.
- Optional parameters specify the sum, in bytes, of the length of the parameter name (1 byte), the length of the length indicator (1 byte), and the length of the parameter content.

Initial Address Message

A UCS DMS–250 switch or services platform sends an Initial Address Message (IAM) forward to initiate seizure of an outgoing circuit. This message contains call handling and routing data.

Message Type code

The hexadecimal code for the IAM's Message Type parameter is 01. Figure 3-2 shows the binary equivalent for the hexadecimal code.

Figure 3-2
Binary code for the IAM's Message Type parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
IAM	0	0	0	0	0	0	0	1

Parameters

Table 3-2 shows the parameters of the IAM.

Table 3-2
IAM parameters

Parameter name	Type	Length	Description
Message Type	F	1 byte	See page 3-50
Nature of Connection Indicator	F	1 byte	See page 3-53
Forward Call Indicator	F	2 bytes	See page 3-43
Calling Party's Category	F	1 byte	See page 3-23
User Service Information	V	3 bytes	See page 3-72
Called Party Number*	V	3-11 bytes	See page 3-19
Calling Party Number*	O	6-12 bytes	See page 3-24
Charge Number*	O	3-9 bytes	See page 3-37
Generic Digits* **	O	2-130 bytes	See page 3-45
Forward Call Indicator	O	4 bytes	See page 3-43
Multiple Business Group	O	9 bytes	See page 3-51
Operator Information	O	12 bytes	See page 3-57
Operator Service Indicator	O	6 bytes	See page 3-66
Originating Line Information	O	3 bytes	See page 3-67
Supplementary Line Information*	O	3 bytes	See page 3-69

—continued—

Table 3-2
IAM parameters (continued)

Parameter name	Type	Length	Description
Transit Network Selector * **	O	5 bytes	See page 3-70

Note 1: RLT functionality involves the parameters marked by an asterisk (*).

Note 2: The switch or services platform will not send certain parameters for non-operator RLT calls when the office parameter ALL_RLT_OPR_CALLS is set to N. This is true unless these parameters are received in an incoming IAM. These parameters are marked by a double asterisk (**).

—end—

Address Complete Message (ACM)

A services platform or UCS DMS–250 switch sends the ACM backward to acknowledge reception of the address information it requires to route the call to the called party.

Message Type code

The hexadecimal code for the ACM's Message Type parameter is 06. Figure 3-3 shows the binary equivalent for the hexadecimal code.

Figure 3-3
Binary code for ACM's Message Type parameter

Bits

	8	7	6	5	4	3	2	1
ACM	0	0	0	0	0	1	1	0

Parameters

Table 3-3 provides a list of ACM parameters.

Table 3-3
ACM parameters

Parameter name	Type	Length	Description
Message Type	F	1 byte	See page 3-50
Backward Call Indicator	F	2 bytes	See page 3-14
Call Reference*	O	6 bytes	See page 3-17
Multiple Business Group	O	9 bytes	See page 3-51

Note: RLT functionality involves the parameters marked by an asterisk (*).

Answer Message (ANM)

A services platform or UCS DMS–250 switch sends an ANM backward when the called party answers the call.

Message Type code

The hexadecimal code for an ANM Message Type parameter is 09. Figure 3-4 shows the binary equivalent for the hexadecimal code.

Figure 3-4
Binary code for an ANM Message Type parameter

Bits	8	7	6	5	4	3	2	1
ANM	0	0	0	0	1	0	0	1

Parameters

Table 3-4 provides a list of ANM parameters the parameters of the ANM.

Table 3-4
ANM parameters

Parameter name	Type	Length	Description
Message Type	F	1 byte	See page 3-50
Network Specific Information	O	6 bytes	See page 3-55
Call Reference*	O	6 bytes	See page
Multiple Business Group	O	9 bytes	See page 3-51
Operator Information*	O	12 bytes	See page 3-57

Note: RLT functionality involves the parameters marked by an asterisk (*).

Note: For a third-party interaction or operator callback call, a UCS DMS–250 switch can bridge a call even before receiving an ANM.

Facility Request message

The services platform sends a Facility Request (FAR) message backward to another exchange (switch) to request the activation of a facility (such as either an RLT bridging or RLT billing capability). After sending a FAR message, the switch waits for an FAA or FRJ response.

Message Type code

The hexadecimal code for a FAR message Message Type parameter is 1F. Figure 3-5 shows the binary equivalent for the hexadecimal code.

Figure 3-5
Binary code for a FAR message Message Type parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
FAR	0	0	0	1	1	1	1	1

Parameters

Table 3-5 provides a list of FAR message parameters.

Table 3-5
FAR message parameters

Parameter name	Type	Length	Description
Message Type	F	1 byte	See page 3-50
Facility Indicator*	F	1 byte	See page 3-41
Called Party Number*	O	3-14 bytes	See page 3-19
Call Reference*	O	8 bytes	See page 3-17
Calling Party Number*	O	4-14 bytes	See page 3-24
Charge Adjustment*	O	8 bytes	See page 3-34
Charge Number*	O	4-14 bytes	See page 3-37
Generic Digits*	O	4-136 bytes	See page 3-45
Operator Information*	O	14 bytes	See page 3-57
Originating Line Information*	O	3 bytes	See page 3-67
Note: RLT functionality involves the parameters marked by an asterisk (*).			

Note 1: The FAR message is unique to RLT functionality; other features of the switch do not require it.

Note 2: Optional parameters specify the sum in bytes of the length of the parameter name (1 byte), the length of the length indicator (1 byte), and the length of the parameter content.

Facility Accept message

A UCS DMS–250 switch sends an Facility Accept (FAA) message forward in response to a FAR message to indicate that it invoked the requested facility (such as either an RLT bridging or RLT billing capability).

Message Type code

The hexadecimal code for an FAA message Message Type parameter is 20. Figure 3-6 shows the binary equivalent for the hexadecimal code.

Figure 3-6
Binary code for an FAA message Message Type parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
FAA	0	0	1	0	0	0	0	0

Parameters

Table 3-6 provides a list of FAA message parameters.

Table 3-6
FAA message parameters

Parameter name	Type	Length	Description
Message Type	F	1 byte	See page 3-50
Facility Indicator*	F	1 byte	See page 3-41
Call Reference	O	8 bytes	See page 3-17
Generic Digits	O	4-136 bytes	See page 3-45
Note: RLT functionality involves the parameters marked by an asterisk (*).			

Note 1: The FAA message is unique to RLT functionality; other features of the switch do not require it.

Note 2: Optional parameters specify the sum in bytes of the length of the parameter name (1 byte), the length of the length indicator (1 byte), and the length of the parameter content.

Facility Reject message

The switch sends an Facility Reject (FRJ) message forward in response to a FAR message to indicate that it could not perform the facility request.

Message Type code

The hexadecimal code for an FRJ message Message Type parameter is 21. Figure 3-7 shows the binary equivalent for the hexadecimal code.

Figure 3-7
Binary code for an FRJ message Message Type parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
FRJ	0	0	1	0	0	0	0	1

Parameters

Table 3-7 provides a list of FRJ message parameters.

Table 3-7
FRJ message parameters

Parameter name	Type	Length	Description
Message Type	F	1 byte	See page 3-50
Facility Indicator*	F	1 byte	See page 3-41
Cause Indicator*	V	3 bytes	See page 3-29

Note: RLT functionality involves the parameters marked by an asterisk (*).

Note: The FRJ message is unique to RLT functionality; other features of the switch do not require it.

Release message

The switch sends a Release (REL) message either forward or backward to indicate that it is releasing the circuit. The REL message defines the cause for the release.

Message Type code

The hexadecimal code for s REL message Message Type parameter is 0C. Figure 3-8 shows the binary equivalent for the hexadecimal code.

Figure 3-8
Binary code for REL message the parameters of the REL message

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
REL	0	0	0	0	1	1	0	0

Parameters

Table 3-8 provides a list of REL message parameters.

Table 3-8
REL message parameters

Parameter name	Type	Length	Description
Message Type	F	1 byte	See page 3-50
Cause Indicator*	V	3 bytes	See page 3-29
Note: RLT functionality involves the parameters marked by an asterisk (*).			

Release Complete message

The switch returns an Release Complete (RLC) message either forward or backward to any switch from which it receives a REL message. An RLC message indicates that the switch performed the release.

Message Type code

The hexadecimal code for a RLC message Message Type parameter is 10. Figure 3-9 shows the binary equivalent for the hexadecimal code.

Figure 3-9
Binary code for a RLC message Message Type parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
RLC	0	0	0	1	0	0	0	0

Parameters

Table 3-9 provides a list of RLC message parameters.

Table 3-9
RLC message parameters

Parameter name	Type	Length	Description
Message Type	F	1 byte	See page 3-50
Cause Indicator*	V	3 bytes	See page 3-29

Note: RLT functionality involves the parameters marked by an asterisk (*).

SS7 ISUP message parameters required by RLT

This section contains format and coding information for the ISUP message parameters that implement SS7 RLT. Table 3-10 lists the parameters. Each parameter description includes a hexadecimal code and an equivalent binary code for the message.

Table 3-10
SS7 ISUP RLT message parameter summary

Parameter name	Hex code	Referenced by messages
Backward Call Indicator	11	ACM
Call Reference*	01	ACM, ANM, FAA, FAR
Called Party Number*	04	IAM, FAR
Calling Party Category*	09	IAM
Calling Party Number*	0A	IAM, FAR
Cause Indicator*	12	REL
Charge Adjustment*	72	FAR
Charge Number*	EB	FAR
Facility Indicator*	18	FAA, FAR, FRJ
Forward Call Indicator	07	IAM
Generic Digits*	C1	IAM, FAA, FAR
Message Type	Varies	All messages

—continued—

Table 3-10
SS7 ISUP RLT message parameter summary (continued)

Parameter name	Hex code	Referenced by messages
Multiple Business Group	C3	IAM, ACM, ANM
Nature of Connection Indicator	06	IAM
Network Specific Information	FE	ANM
Operator Information*	70	IAM, ANM, FAR
Operator Service Indicator	74	IAM
Originating Line Information*	EA	IAM, FAR
Supplementary Line Information*	E4	IAM
Transit Network Selector*	23	IAM
User Service Information	1D	IAM

Note: RLT functionality involves the parameters marked by an asterisk (*).

—end—

Backward Call Indicator parameter

The Backward Call Indicator parameter is a mandatory, fixed-length parameter in the ACM. It provides call information to tandem and remote switches. This parameter contains the following indicator codes:

- charge indicator
- called party’s status indicator
- called party’s category indicator
- end-to-end method indicator
- interworking indicator
- end-to-end information indicator
- ISUP indicator
- reverse holding indicator
- ISDN access indicator

Parameter code

The hexadecimal code for the Backward Call Indicator parameter is 11. Figure 3-10 shows the binary equivalent for the hexadecimal code.

Figure 3-10
Binary code for Backward Call Indicator parameter

	Bits							
Backward Call Indicator	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
	0	0	0	1	0	0	0	1

Parameter field

Figure 3-11 illustrates the format of the Backward Call Indicator parameter field.

Figure 3-11
Format of the Backward Call Indicator parameter field

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Octet 1	H	G	F	E	D	C	B	A
Octet 2	P	O	N	M	L	K	J	I

Table 3-11 describes the codes in the Backward Call Indicator parameter.

Table 3-11
Field codes for the Backward Call Indicator parameter

Bits	Codes and descriptions
BA	Charge indicator 00 = no indication 01 = no charge 10 = charge 11 = spare
DC	Called party's status indicator 00 = no indication 01 = subscriber free 10 = connect when free 11 = spare
FE	Called party's category indicator 00 = no indication 01 = ordinary (non-payphone) subscriber 10 = payphone 11 = spare
HG	End-to-end method indicator 00 = no end-to-end method available 01 = pass along method available 10 = SCCP method available 11 = pass along and SCCP methods available
I	Interworking indicator 0 = no interworking encountered (SS7 all the way) 1 = interworking encountered

—continued—

Table 3-11
Field codes for the Backward Call Indicator parameter (continued)

Bits	Codes and descriptions
J	end-to-end information indicator 0 = no end-to-end information available 1 = end-to-end information available
K	ISUP indicator 0 = ISUP not used all the way 1 = ISUP used all the way
L	Reverse holding indicator 0 = reverse holding not required 1 = reserved
M	ISDN access indicator 0 = terminating access non-ISDN 1 = terminating access ISDN
N-P	Reserved or spare (coded zero)
	—end—

Call Reference parameter

This optional parameter in ACM, ANM, FAA, and FAR messages conveys circuit-independent information that identifies a particular call. This parameter holds the call identity and the point code of the node (switch) for the call.

The terminating switch passes this parameter back to the services platform in ANMs and ACMs. A switch will include this parameter in an ANM only if it did not receive an ACM with the call identity and point code.

In a FAR message for a third-party interaction or operator-initiated call, the switches pass this parameter backward to the bridging UCS DMS–250 switch to help it determine which calls to bridge together.

As each intermediate tandem switch passes this parameter in an ANM or ACM, it replaces its own call identification and point code values with the values in this parameter. As each intermediate tandem switch passes this parameter in a FAR message, it replaces this parameter's call identification and point code values with values received in an ANM or ACM.

Note: The host UCS DMS-250 switch does not add this parameter to ANMs; only an Enhanced Services Provider (ESP) with proper programming returns this parameter in ANMs.

Parameter code

The hexadecimal code for the Call Reference parameter is 01. Figure 3-12 shows the binary equivalent for the hexadecimal code.

Figure 3-12
Binary code for Call Reference parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Call Reference	0	0	0	0	0	0	0	1

Parameter field

Figure 3-13 illustrates the format of the Call Reference parameter field.

Figure 3-13
Format of the Call Reference parameter field

<table>
<tr><td></td><td colspan="8">Bits</td></tr>
<tr><td></td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>Octet 1</td><td colspan="8" rowspan="2">Call identity</td></tr>
<tr><td>Octet 2</td></tr>
<tr><td>Octet 3</td><td colspan="2">Spare</td><td>Spare</td><td colspan="5">Call identity</td></tr>
<tr><td>Octet 4</td><td colspan="8" rowspan="3">Point code</td></tr>
<tr><td>Octet 5</td></tr>
<tr><td>Octet 6</td></tr>
</table>

Table 3-12 describes the codes in the Call Reference parameter. The UCS DMS-250 switch codes these fields at call time.

Table 3-12
Field codes for the Call Reference parameter

Field	Codes and descriptions
Call identity	The switch pads this 21-bit code to 24 bits. The switch assigns this code to uniquely identify a call.
Point code	Point code is the code of the signaling point in which the call is relevant.
Note: For each subordinate field, the UCS DMS-250 switch sends the least significant octet first.	

Called Party Number parameter

The Called Party Number parameter identifies the called party. It is a mandatory, variable-length parameter for the IAM. For a bridging FAR message, this parameter is optional.

The UCS DMS-250 switch uses the Called Party Number parameter in an IAM to route and bill RLT calls. The value of the parameter is captured in the Called Number field of the CDR. In an IAM, this parameter also provides a nature of address value that indicates whether the call is operator-assisted and whether the switches have treated the call.

For a redirected call, the remote UCS DMS-250 switch uses this parameter in a FAR message to translate and route the call. For both redirected and third-party transfer calls, the UCS DMS-250 switches copy the value of this parameter in a FAR message and add the value to the Called Number field in the operator services record (OSR) and CDR for the call.

Note: If a bridging FAR message does not contain a Called Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the call's OSR.

Parameter code

The hexadecimal code for the Called Party Number parameter is 04. Figure 3-14 shows the binary equivalent for the hexadecimal code.

Figure 3-14
Binary code for the Called Party Number parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Called Party Number	0	0	0	0	0	1	0	0

Parameter field

Figure 3-15 illustrates the format of the Called Party Number parameter field.

Figure 3-15
Format of the Called Party Number parameter field

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Octet 1	O/E	Nature of address indicator						
Octet 2	0	Numbering plan indicator			0	0	0	0
Octet 3	D2				D1			
Octet 4	D4				D3			
Octet 5	D6				D5			
Octet 6	D8				D7			
Octet 7	DN-2				DN-3			
Octet M	DN (or 0000)				DN-1			

Table 3-13 describes the codes in the Called Party Number parameter.

Table 3-13
Field codes for the Called Party Number parameter

Field	Codes and descriptions
Odd/Even indicator	0 indicates an even number of destination number (DN) digits. 1 indicates an odd number of DN digits.
Nature of address indicator	*0000101 = non-zero, national number, operator requested *0000110 = non-zero, international number, operator requested 00000111–1101111 = Spare 1110000 = treated call 1110001 = subscriber number, operator requested (0+) 1110010 = national number, operator requested (0+) 1110011 = international number, operator requested (01+) 1110100 = no address present, operator requested 1110101 = no address present, cut-through call to carrier 1110110 = 950+ call from a local exchange carrier public station, hotel/motel line, or non-Equal Access End Office (EAEO). 1110111 = test line test code 1111000 to 1111110 = reserved for network-specific use 1111111 = reserved ***Note:*** The UCS DMS-250 switches no longer use certain values for non-operator RLT calls when the office parameter ALL_RLT_OPR_CALLS is set to N. These values are marked by an asterisk (*).

—continued—

Table 3-13
Field codes for the Called Party Number parameter (continued)

Field	Codes and descriptions
Numbering plan indicator	000 = unknown 001 = ISDN numbering plan 010 = telephony numbering plan 011 to 111 = reserved
D1-DN address information	The D1-DN address information field represents the digits of the destination number (DN). Each digit occupies four bits that are in binary code decimal (BCD) format. The digits start from D1 in the order dialed. For example, when 703-823-6279 is dialed, digit one equals 7, digit two equals 0, digit three equals 3, and so on. If the caller dials an odd number of digits, the switch inserts a filler code of 0000 after the last address digit. 0000 = digit zero 0001 = digit one 0010 = digit two 0011 = digit three 0100 = digit four 0101 = digit five 0110 = digit six 0111 = digit seven 1000 = digit eight 1001 = digit nine 1010 = spare 1011 = reserved 1100 = reserved

—continued—

Table 3-13
Field codes for the Called Party Number parameter (continued)

Field	Codes and descriptions
D1-DN address information (continued)	1101 = spare 1110 = spare 1111 = reserved ***Note:*** With nature of address indicator codes of 1110100 (no address present, operator requested, 0-, 10XXX+0, or 00- call) or 1110101 (no address present, cut-through call to carrier), the message does not contain DN digits. The Called Party Number parameter contains only the first octet (#1) and omits the subsequent (#2-M) bytes.
—end—	

Calling Party Category parameter

The Calling Party Category parameter in the IAM indicates the category of the calling party. This fixed-length parameter is mandatory.

Parameter code

The hexadecimal code for the Calling Party Category parameter is 09. Figure 3-16 shows the binary equivalent for the hexadecimal code.

Figure 3-16
Binary code for Calling Party Category parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Calling Party Category	0	0	0	0	1	0	0	1

Parameter field

Figure 3-17 illustrates the format of the Calling Party Category parameter field.

Figure 3-17
Format of the Calling Party Category parameter field

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Octet 1	Calling party category							

Table 3-14 describes the codes in the Calling Party Category parameter.

Table 3-14
Field codes for the Calling Party Category parameter

Value	Codes and descriptions
00000000	Calling party category unknown*
00001010	Ordinary calling subscriber (precedence level 1)
00001101	test call

Calling Party Number parameter

The Calling Party Number provides information that identifies the calling party. The UCS DMS-250 switches include this optional parameter in the outgoing IAM for a per-trunk signaling (PTS) FGD call or a pseudo-automatic numbering identification (PANI) call to an ISUP IMT. Switches can also include this parameter in FAR messages.

In an IAM, this parameter contains an automatic numbering identification (ANI) value. The UCS DMS-250 switches add the ANI value to the ANI Spill field in the CDR for the call.

For both redirected and third-party transfer calls, the UCS DMS-250 bridging switch copies the value of this parameter in a FAR message and adds the value to the Calling Number field in the OSR for the call.

Note: If a FAR message does not contain a Calling Party Number parameter, the switch obtains billing information from the call’s CDR and includes it in the call’s OSR.

Parameter code

The hexadecimal code for the Calling Party Number parameter is 0A. Figure 3-18 shows the binary equivalent for the hexadecimal code.

Figure 3-18
Binary code for the Calling Party Number parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Calling Party Category	0	0	0	0	1	0	1	0

Parameter field

Figure 3-19 shows the format of the Calling Party Number parameter.

Figure 3-19
Format of the Calling Party Number parameter field

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Octet 1	O/E	Nature of address indicator						
Octet 2	0	Numbering plan			Presentation		Screening	
Octet 3	D2				D1			
Octet 4	D4				D3			
Octet 5	D6				D5			
Octet 6	D8				D7			
Octet 7	DN-2				DN-3			
Octet M	DN (or 0000)				DN-1			

Table 3-15 describes the codes in the Calling Party Number parameter.

Table 3-15
Field codes for the Calling Party Number parameter

Field	Codes and descriptions
Odd/Even indicator	0 indicates an even number of DN digits. 1 indicates an odd number of DN digits.
Nature of address indicator	0000000 = spare 0000001 = subscriber number 0000010 = spare; reserved for national use 0000011 = national (significant) number 0000100 = international number 0000101 = non-zero, national number, operator requested 0000110 = non-zero, international number, operator requested 0000111-1101111 = spare 1110000 = treated call 1110001 = subscriber number, operator requested (0+) 1110010 = national number, operator requested (0+) 1110011 = international number, operator requested (01+) 1110100 = no address present, operator requested 1110101 = no address present, cut-through call to carrier 1110110 = 950+ call from a local exchange carrier public station, hotel/motel line, or non-EAEO. 1110111 = test line test code 1111000 = PANI 1111001 to 1111110 = reserved for network-specific use 1111111 = reserved

—continued—

Table 3-15
Field codes for the Calling Party Number parameter (continued)

Field	Codes and descriptions
Numbering plan	000 = unknown 001 = ISDN numbering plan 010 = telephony numbering plan 011 to 111 = reserved
Presentation Indicator	The switch sets the Presentation Indicator to allow address presentation when a call originates on a PTS trunk and terminates to an ISUP IMT. If the call originates on an ISUP IMT and terminates to an ISUP IMT, the switch takes the value from the incoming IAM and codes it into the outgoing IAM. 00 = address presentation allowed 01 = address presentation restricted 10 = address unavailable due to interworking 11 = spare/reserved
Screening	00 = user provided, not screened 01 = user provided, screening passed 10 = user provided, screening failed 11 = network provided

—continued—

Table 3-15
Field codes for the Calling Party Number parameter (continued)

Field	Codes and descriptions
DN address information	The D1-DN address information field represents the digits of the DN. Each digit occupies four bits that are in BCD format. The digits start from D1 in the same order that they are dialed. For example, when 703-823-6279 is dialed, digit one equals 7, digit two equals 0, digit three equals 3 and so on. If the caller dials an odd number of digits, the switch inserts a filler code of 0000 after the last address signal. 0000 = digit zero 0001 = digit one 0010 = digit two 0011 = digit three 0100 = digit four 0101 = digit five 0110 = digit six 0111 = digit seven 1000 = digit eight 1001 = digit nine 1010 = spare 1011 = reserved 1100 = reserved 1101 = spare 1110 = spare 1111 = reserved
—end—	

Cause Indicator parameter

The Cause Indicator parameter provides the coding standard, location, and cause value for the call. It also provides diagnostics, but the UCS DMS-250 switch does not support diagnostics. This mandatory, variable-length parameter describes why the switch sent the REL, ACM, or FRJ message that contains it. This parameter also identifies the network that originated the message.

In the FRJ message, this parameter defines why a switch could not perform the action that a FAR message requested. In REL and RLC messages, this parameter defines why the switches disconnected the call.

Parameter code

The hexadecimal code for the Cause Indicator parameter is 12. Figure 3-20 shows the binary equivalent for the hexadecimal code.

Figure 3-20
Binary code for Cause Indicator parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Cause Indicator	0	0	0	1	0	0	1	0

Parameter field

Figure 3-21 illustrates the format of the Cause Indicator parameter field.

Figure 3-21
Format of the Cause Indicator field

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Octet 1	Ext 1	Coding standard		Spare	Location			
Octet 2	Ext 1	Cause value						

Table 3-16 describes the codes in the Cause Indicator parameter field.

Table 3-16
Field codes for the Cause Indicator parameter

Field	Codes and descriptions
Extension indicator	The extension indicator continues through the next octet. For example, octets 1 to 1a or 2 to 2a. If octet 1 or 2 is extended, the switch interprets the cause value as though it were 1111111.
Octet 1	0 = octet continues through next octet
	1 = this octet is not extended
Octet 2	0 = octet continues through next octet
	1 = this octet is not extended
Coding standard	00 = CCITT standard
	01 = reserved
	10 = reserved
	11 = network-specific
General Location	0000 = user
	0010 = local: local network in REL message
	0011 = transit (public) network in FRJ message
	1010 = unknown

—continued—

Table 3-16
Field codes for the Cause Indicator parameter (continued)

Field	Codes and descriptions
Cause value	Cause value has two fields: a class (bits 5 to 7) and a value within the class (bits 1 to 4). The decimal equivalent of the cause values are in parenthesis. All values belong to the CCITT standard set. **Class 000 and 001 (normal event):** 0000001 = unallocated number (1) 0000010 = no route to specified transit network (2) 0000011 = no route to destination (3) 0000100 = send special information tone (4) 0000101 = incorrectly dialed trunk prefix (5) 0010000 = normal clearing (16) 0010001 = user busy (17) 0010010 = no user responding (18) 0010011 = no answer from user (19) 0010101 = call rejected (21) 0010110 = number changed (22)
Cause value (continued)	0011001 = translations fail ed(25) 0011010 = call returns (26) 0011011 = destination out of service (27) 0011100 = address incomplete (28) 0011101 = facility rejected (29) 0011110 = apply locally (30) (proprietary) 0011111 = normal, unspecified (31) ***Note:*** The UCS DMS-250 switch interprets other values as 0011111.
—continued—	

Table 3-16
Field codes for the Cause Indicator parameter (continued)

Field	Codes and descriptions
Cause value (continued)	**Class 010, resource unavailable:**
	0100010 = no circuit available (34)
	0100110 = network out of order (38)
	0100111 = bridging failed due to reorigination failure (39)
	0101001 = temporary failure (41)
	0101010 = switching equipment congestion (42)
	0101011 = user information discarded (43)
	0101100 = requested channel not available (44)
	0101101 = preemption (45)
	0101110 = no preemption circuit available (46)
	0101111 = resource unavailable-unspecified (47)
	Note: Spare values are interpreted as if coded as 0101111.
	Class 011, service or option not available:
	0110001 = previous billing determination (31)
	0110100 = outgoing calls barred (52)
	0110101 = incompatible agents (53)
	0111001 = bearer capability not authorized (57)
	0111010 = bearer capability not implemented (58)
	0111111 = service/option not available-unspecified (63)
	Note: spare values are interpreted as if coded as 0111111.
	Class 100, service or option not implemented:
	1000001 = bearer capability not implemented (65)
	1000010 = channel type not implemented (66)
	1000101 = facility not implemented (69)
	1000110 = only restricted digital information bearer capability is available (70)
	1001111 = service or option not implemented (79)
	Note: Spare values are interpreted as if coded as 1001111.

—continued—

Table 3-16
Field codes for the Cause Indicator parameter (continued)

Field	Codes and descriptions
Cause value (continued)	**Class 101, invalid message (out of range):** 1010001 = invalid call reference value (81) 1010111 = user not member of user group (87) 1011000 = incompatible destination (88) 1011111 = invalid message unspecified (95) ***Note:*** Spare values are interpreted as if coded as 1011111. **Class 110, protocol error (unknown message):** 1100001 = message type non-existent or not implemented (97) 1100011 = parameter non-existent or not implemented (99) 1100100 = invalid parameter contents (100) 1100111 = parameter not passed or not implemented (103) 1101111 = protocol error, unspecified (111) ***Note:*** Spare values are interpreted as if coded as 1101111. **Class 111, Interworking class:** 1111111 = interworking, unspecified (127) ***Note:*** Spare values are interpreted as if coded as 1111111.
—end—	

Charge Adjustment parameter

The Charge Adjustment parameter contains billing information for a call after an operator or ESP has adjusted the charge. This information includes the charge adjust time of day, charge adjust type, charge adjust indicator, charge adjust amount, and charge adjust entry code. The UCS DMS-250 switches add the information from this parameter to the Indic, Adjtype, Adjentry, Adjtime, and Adjamt fields in the OSR for the call. FAR messages include this optional parameter.

Parameter code

The hexadecimal code for the Charge Adjustment parameter is 72. Figure 3-22 shows the binary equivalent for the hexadecimal code.

Figure 3-22
Binary code for Charge Adjustment parameter

Bits	8	7	6	5	4	3	2	1
Charge Adjust	0	1	1	1	0	0	1	0

Parameter field

Figure 3-23 illustrates the format of the Charge Adjustment parameter field.

Figure 3-23
Format of the Charge Adjustment parameter field

Bits

	8	7	6	5	4	3	2	1
Octet 1	H	G	F	E	D	C	B	A
Octet 2	P	O	N	M	L	K	J	I
Octet 3	X	W	V	U	T	S	R	Q
Octet 4	f	e	d	c	b	a	Z	Y
Octet 5	n	m	l	k	j	i	h	g
Octet 6	v	u	t	s	r	q	p	o

Table 3-17 describes the codes in the Charge Adjustment parameter.

Table 3-17
Field codes for the Charge Adjustment parameter

Bits	Codes and descriptions
F-A	Charge adjust time of day-minute 6 bits range = 0-59
H-G	Charge adjust indicator 00 = no indicator provided 01 = minutes to be credited 10 = dollars and cents to be credited 11 = entire call to be credited
M-I	Charge adjust time of day-hour 5 bits range = 0-23
P-N	3 spare bits (coded as zero)

—continued—

Table 3-17
Field codes for the Charge Adjustment parameter (continued)

Bits	Codes and descriptions
T-Q	Charge adjust type 0000 = wrong number 0001 = cancel previous charge adjust 0010 = poor transmission 0011 = not used 0100 = not used 0101 = cut off call 0110 = manually rated 0111 = change billing 1000 = walk away (future use) 1001 = coin credit (future use)
X-U	4 spare bits (coded as zero)
L-Y	Charge adjustment amount 14 bits range = 0-9999 In cents as: 0001-9999 In minutes as: 00-99 (followed by fillers)
n-m	2 spare bits (coded as zero)
u-o	Charge adjust entry code 7 bits range = 0-127 (Refer to call classification for a list of possible entry codes.)
v	1 spare bit (coded as zero)

—end—

Charge Number parameter

The Charge Number parameter provides billing information to the UCS DMS-250 switch. This parameter can provide information for third-party, calling card, or credit card billing. UCS DMS-250 switches add this parameter's information to the billnumb field in the OSR for the call.

To make a UCS DMS-250 switch start timing a call for billing, a services platform sets the facility indicator in this optional parameter to "start time request" and sends a FAR message.

In an IAM, this parameter also contains an automatic numbering identification (ANI) value. If the ANI is contained in this parameter, the switches add this value to the ANI SPILL field in the call's CDR. If not, the switches get the ANI value from the Calling Party Number parameter.

Parameter code

The hexadecimal code for the Charge Number parameter is EB. Figure 3-24 shows the binary equivalent for the hexadecimal code.

Figure 3-24
Binary code for the Charge Number parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Charge Number	1	1	1	0	1	0	1	1

Parameter field

Figure 3-25 illustrates the format of the Charge Number parameter.

Figure 3-25
Format of the Charge Number parameter field

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Octet 1	O/E	Nature of address indicator						
Octet 2	0	Numbering plan			0	0	0	0
Octet 3	D2				D1			
Octet 4	D4				D3			
Octet 5	D6				D5			
Octet 6	D8				D7			
Octet 7	DN-2				DN-3			
Octet M	DN (or 0000)				DN-1			

Table 3-18 describes the codes in the Charge Number parameter field.

Table 3-18
Field codes for the Charge Number parameter

Field	Codes and descriptions
Odd/Even indicator	0 indicates an even number of DN digits. 1 indicates an odd number of DN digits. (These values are coded at call time.)
Nature of address indicator	0000000 = spare 0000001 = subscriber number 0000010 = spare; reserved for national use 0000011 = national (significant) number 0000100 = international number 0000101 = non-zero, national number, operator requested 0000110 = non-zero, international number, operator requested 0000111–1101111 = spare 1110000 = treated call 1110001 = subscriber number, operator requested (0+) 1110010 = national number, operator requested (0+) 1110011 = international number, operator requested (01+) 1110100 = no address present, operator requested 1110101 = no address present, cut-through call to carrier 1110110 = 950+ call from a local exchange carrier public station, hotel or motel line, or non-Equal Access End Office (EAEO). 1110111 = test line test code 1111000 = Pseudo-ANI Information (PANI) 1111001 to 1111110 = reserved for network-specific use 1111111 = reserved

—continued—

Table 3-18
Field codes for the Charge Number parameter (continued)

Field	Codes and descriptions
Numbering plan indicator	000 = unknown 001 = ISDN numbering plan 010 = telephony numbering plan 011 to 111 = reserved
DN address information	The D1-DN address information field represents the digits of the destination number. Each digit occupies four bits that are encoded in binary coded decimal (BCD) format. 0000 = digit zero 0001 = digit one 0010 = digit two 0011 = digit three 0100 = digit four 0101 = digit five 0110 = digit six 0111 = digit seven 1000 = digit eight 1001 = digit nine 1010 = spare 1011 = reserved 1100 = reserved 1101 = spare 1110 = spare 1111 = reserved
—end—	

Facility Indicator parameter

The Facility Indicator parameter contains information that defines and controls RLT billing. FAR, FAA, and FRJ messages contain this mandatory, fixed-length parameter. This parameter defines the specific action that a FAR message requests at the bridging or remote UCS DMS-250 switch. The FAA and FRJ messages contain the same value to provide information.

Parameter code

The hexadecimal code for the Facility Indicator parameter is 18. Figure 3-26 shows the binary equivalent for the hexadecimal code.

Figure 3-26
Binary code for Facility Indicator parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Facility Indicator	0	0	0	1	1	0	0	0

Parameter field

Figure 3-27 illustrates the format of the Facility Indicator parameter field.

Figure 3-27
Format of the Facility Indicator parameter field

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Octet 1	Facility Indicator							

Table 3-19 describes the codes in the Facility Indicator parameter field.

Table 3-19
Field codes for the Facility Indicator parameter

Value	Codes and descriptions	
00011010	Context Block FAR	(1A)
00011011	Request Context Block FAR	(1B)
00010000	Release link for third-party interaction call	(10)
*00010001	Release link for operator redirect	(11)
00010010	Request information from remote	(12)
00010011	Start billing time	(13)
00010100	Cancel billing time	(14)
00010101	Restart billing at zero, no accumulation	(15)
00010111	Billing information only	(17)
00011000	Reorigination information only	(18)

Note 1: Although it supports FAR messages with facility indicator values of “restart billing time” or “billing info only,” the UCS DMS–250 switch does not expect to receive them.

Note 2: The host UCS DMS-250 switch supports these value when the office parameter, RLT_REDIRECT, is set to Y. These values are marked by an asterisk (*).

Forward Call Indicator parameter

The Forward Call Indicator parameter contains the following:

- incoming international call indicator
- end-to-end method indicator
- interworking indicator
- end-to-end information indicator
- ISUP indicator
- ISUP preference indicator
- ISDN access indicator
- SCCP method indicator

The IAM contains this mandatory, fixed-length parameter.

Parameter code

The hexadecimal code for the Forward Call Indicator parameter is 07. Figure 3-28 shows the binary equivalent for the hexadecimal code.

Figure 3-28
Binary code for Forward Call Indicator parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Forward Call Indicator	0	0	0	0	0	1	1	1

Parameter field

Figure 3-29 illustrates the format of the Forward Call Indicator parameter field.

Figure 3-29
Format of the Forward Call Indicator field

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Octet 1	H	G	F	E	D	C	B	A
Octet 2	P	O	N	M	L	K	J	I

Table 3-20 describes the codes in the Forward Call Indicator parameter field.

Table 3-20
Field codes for the Forward Call Indicator parameter

Bit	Codes and descriptions
A	National/international call indicator:
	0 = incoming national call
	1 = incoming international call
C - B	End-to-end method indicator:
	00 = no end-to-end method available
	01 = pass along method available
	10 = SCCP method available
	11 = pass along and SCCP methods available
D	Interworking indicator:
	0 = no interworking encountered (SS7 all the way)
	PRA to ISUP: no interworking if no interworking previously encountered
	1 = interworking encountered
	PTS to ISUP: interworking encountered
E	End-to-end information indicator:
	0 = no end-to-end information available
	1 = end-to-end information available
F	ISUP indicator:
	0 = ISUP not used all the way
	1 = ISUP used all the way
H - G	ISUP preference indicator:
	00 = ISUP preferred all the way (default)
	01 = ISUP not required all the way
	10 = ISUP required all the way
	11 = spare

—continued—

Table 3-20
Field codes for the Forward Call Indicator parameter (continued)

Bit	Codes and descriptions
I	ISDN access indicator:
	0 = originating access non-ISDN
	1 = originating access ISDN
L-J	Spare (coded as 0)
P-M	Reserved for national use (coded as 0)
	—end—

Generic Digits parameter

The Generic Digits parameter contains information in the form of digits pertaining to a supplementary service. It defines the type of digits it contains and includes encoding method indicators. Switches send this optional parameter in IAM, FAA, and FAR messages.

Table 3-21 defines how the Generic Digits parameter varies for different messages and different call scenarios.

Table 3-21
Generic Digits parameter for messages and scenarios

Message	Call scenario	Description
IAM	Boomerang reorigination	For reoriginated calls, the Generic Digits parameter contains a Call Identification (CALLID) value that identifies the previous call. The services platform sends the CALLID value in the ANM to the bridging UCS DMS-250 switch. For this scenario, a value of 00101 in the Type of Digits field defines the digits as the caller identity. The Generic Digits parameter contains the RLT context block available information and is used in the IAM message built on boomerang reorigination to let the Services Platform know that the UCS DMS-250 switch has a context block for the call, as well as information about the call's state (0–originating, 1–talking, 2–disconnect) at the time of reorigination.
IAM	XFROPSEL routing	The Generic Digits parameter specifies the queue for the host UCS DMS-250 switch to use. For this scenario, a value of 01011 in the Type of Digits field defines the digits as the alternate queue.
IAM	All scenarios	If the Nature of Address field in the IAM's Called Party Number parameter indicates that the call requires treatment, the Generic Digits parameter specifies the type of treatment. For any scenario, a value of 01001 in the Type of Digits field defines the digits as the call treatment type. ***Note:*** For boomerang reorigination, the Generic Digits Parameter contains the call identity obtained from either the incoming FAR message or the Call Reference parameter of the ANM for the previous call.

—continued—

Table 3-21
Generic Digits parameter for messages and scenarios (continued)

Message	Call scenario	Description
FAA	OGTSPKEY routing	The Generic Digits parameter holds the contents of the CLDNO field from the remote switch's OGTSPKEY table. For this scenario, a value of 00111 in the Type of Digits field defines the digits as the OGT called number.
FAA, FAR	Boomerang reorigination	FAR, FAA Boomerang reorigination Generic Digits RLT context block is used by the FAR/FAA messages to hold the context block that is sent between the Services Platform and the UCS DMS-250 switch.
FAR	OGTSPKEY routing	The Generic Digits parameter holds the OGT key number that the operator entered. For this scenario, a value of 00110 in the Type of Digits field defines the digits as the OGT key number.
FAR	Redirect, third-party interaction, and operator call-back	The Generic Digits parameter contains the CALLID value that the services platform provided. The bridging switch places this value in the CALLID field of the OSR for the call and uses the value to match OSRs on both the host and bridging UCS DMS-250 switches. For this scenario, a value of 00101 in the Type of Digits field defines the digits as the caller identity.
—end—		

Parameter code

The hexadecimal code for the Generic Digits parameter is C1. Figure 3-30 shows the binary equivalent for the hexadecimal code.

Figure 3-30
Binary code for Generic Digits parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Generic Digits	1	1	0	0	0	0	0	1

Parameter field

Figure 3-31 illustrates the format of the Generic Digits field.

Figure 3-31
Format of the Generic Digits field

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Octet 1	Encoding scheme			Type of digits				
Octet 2-*N*	Generic digits							
	. . .							

Table 3-22 describes the codes in the Generic Digits parameter field.

Table 3-22
Field codes for the Generic Digits parameter

Field	Codes and descriptions
Encoding scheme	000 = BCD even 001 = BCD odd 010 = IA5 011 = binary 110-111 = spare
Type of Digits	00000 = account code 00001 = authorization code (BCD) 00010 = private networking classmark 00011 = CLLI administration information (IA5) 00100 = ANI index 00101 = call ID (BIN) 00110 = OGT key number (BIN) 00111 = OGT called number (BCD) 01000 = redirect information 01001 = Terminating Switch ID and trunk group (BIN) 01010 = RLT treatment code (BIN) 01011 = alternate queue (BIN) 01100 = call reference ID 01101 = spare 01110 = context Block

—continued—

Table 3-22
Field codes for the Generic Digits parameter (continued)

Field	Codes and descriptions
Type of digits	10000 = originating switch ID and OGT
	10001 = IMT information (BCD even)
	10010 = hotel room number
	10011 = hotel guest name
	10100 = division identifier (BIN)
	10101 = trunk information
	10110 = 00Y
	11000 = transport information
	11001 = OPCHOICE index (BIN)
	11010 = BILLNUM (BCD)
	11011 = UNIVACC (BCD)
	11100 = PINDIGS (BCD)
	11101 = ACCTCD (BCD)
	11110 = context block available
	11111 = spare
Generic digits	133 bytes containing the information that is appropriate for the type of digits.
—end—	

Message Type parameter

The Message Type parameter identifies the type of ISUP message. All SS7 ISUP messages include this mandatory, fixed-length parameter.

Parameter code

Each type of ISUP message has a unique hexadecimal code that defines its type. For example, the hexadecimal code for FAR messages is 1F. The message descriptions earlier in this section define the hexadecimal code for each Message Type parameter.

Parameter field

Figure 3-32 illustrates the format of the Message Type parameter field.

Figure 3-32
Format of the Message Type parameter field

	Bits							
	8	7	6	5	4	3	2	1
Octet 1	Message Type							

Table 3-23 describes the codes in the Message Type parameter.

Table 3-23
Field codes for the Message Type parameter

Value	Descriptions and codes
00000001	IAM (01)
00000110	ACM (06)
00001001	ANM (09)
00011111	FAR message (1F)
00100000	FAA message (20)
00100001	FRJ message (21)
00000011	REL message (0C)
00010000	RLC message (10)

Multiple Business Group parameter

If the MBGXLA option for the ISUP IMT is Y, the switch sends a Multiple Business Group parameter in the IAM. Switches include it in ACMs and ANMs as well as IAMs.

Parameter code

The hexadecimal code for the Multiple Business Group parameter is C3. Figure 3-33 shows the binary equivalent for the hexadecimal code.

Figure 3-33
Binary code for Multiple Business Group parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Multiple Business Group	1	1	0	0	0	0	1	1

Parameter field

Figure 3-34 illustrates the format of the Multiple Business Group parameter field.

Figure 3-34
Format of the Multiple Business Group parameter field

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Octet 1	Party				Spare			
Octet 2	Length							
Octet 3 Octet 4	Network ID							
Octet 5 Octet 6	Network Customer Group ID							
Octet 7	Line Privileges Indicator							

Table 3-24 describes the codes in the Multiple Business Group parameter field.

Table 3-24
Field codes for Multiple Business Group parameter

Field	Codes and descriptions
Party selection code	0000 = NETINFO calling party
Spare	0000 = spare
Length	00000101 = length is always five
Network ID	2 octets containing the value from the NETID field in the NETNAMES table
Network customer group ID	2 octets containing a value representing the Centrex customer group from the NETCGID field in the CUSTNTWK table
Line privileges indicator	1 octet containing a value representing NCOS from the NETTOSTS and STSTONET tables

Nature of Connection Indicator parameter

The Nature of Connection Indicator parameter contains the satellite indicator, continuity check indicator, and echo control device indicator. Switches send this mandatory, fixed-length parameter in the IAM.

Parameter code

The hexadecimal code for the Nature of Connection Indicator parameter is 06. Figure 3-35 shows the binary equivalent for the hexadecimal code.

Figure 3-35
Binary code for Nature of Connection Indicator parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Nature of Connection Indicator	0	0	0	0	0	1	1	0

Parameter field

Figure 3-36 illustrates the format of the Nature of Connection Indicator parameter field.

Figure 3-36
Format of the Nature of Connection Indicator parameter field

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Octet 1	H	G	F	E	D	C	B	A

Table 3-25 describes the codes in the Nature of Connection Indicator parameter.

Table 3-25
Field codes for the Nature of Connection Indicator parameter

Bit	Codes and descriptions
BA	Satellite indicator:
	00 = no satellite circuit in the connection
	01 = one satellite circuit in the connection. (This default value is set if table TRKSGRP's datafill for the terminator has the SAT field set to Y.)
DC	Continuity check indicator (coded at call time based on datafill in TRKSGRP table):
	00 = continuity check not required
	01 = continuity check required on this circuit
	10 = continuity check performed on previous circuit
	11 = spare
E	Echo suppressor indicator:
	0 = N in table TRKSGRP
	1 = H in table TRKSGRP
H-F	Unused:
	000 = spare (coded as 0)

Network-specific Information parameter

The Network-specific Information parameter contains a completion code, answer type, trunk group number, and switch ID. Switches send this mandatory, fixed-length parameter in an ANM.

Parameter code

The hexadecimal code for the Network-specific Information parameter is FE. Figure 3-37 shows the binary equivalent for the hexadecimal code.

Figure 3-37
Binary code for Network-specific Information parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Network Specific Information	1	1	1	1	1	1	1	0

Parameter field

Figure 3-38 illustrates the format of the Network-specific Information parameter field.

Figure 3-38
Format of the Network-specific Information parameter field

<table>
<tr><th colspan="8">Bits</th></tr>
<tr><th>8</th><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th></tr>
<tr><td colspan="4">Completion code</td><td colspan="4">Answer type</td></tr>
<tr><td colspan="8">Trkgrp number</td></tr>
<tr><td colspan="4">Spare</td><td colspan="4">Trkgrp number</td></tr>
<tr><td>Spare</td><td colspan="7">Switch ID</td></tr>
</table>

Table 3-26 describes the codes in the Network-specific Information parameter.

Table 3-26
Field codes for the nature of the Network-specific Information parameter

Field	Codes and descriptions
Answer type	0000 = nil answer
	0001 = software, no voice detected
	0010 = software, voice detected
	0011 = software, ring detected
	0100 = non-IMT hardware answer
	0101 = software silence
	0110 = undefined
	0111 = audio tone detector hardware failure
	1000 = software, busy tone detected
	1001 = software, reorder tone detected
	1010 = IMT software answer
	1011 = IMT hardware answer
	1100–1111 = spare
Completion code	0000 = normal call
	0001 = off-net route advance invoked
Final terminating trunk	Switch ID = 0–127
	Trunk group number = 0–4095

Operator Information parameter

The Operator Information parameter contains information about the answering agent. Switches send this optional parameter in IAMs, ANMs, and FAR messages. Specifically, this parameter provides operator information to the bridging UCS DMS-250 switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields of the OSR for the call.

Note: In an ANM, this parameter's Reorigination Type field determines what type of reorigination a UCS DMS-250 switch can perform for the call.

Parameter code

The hexadecimal code for the Operator Information parameter is 70. Figure 3-39 shows the binary equivalent for the hexadecimal code.

Figure 3-39
Binary code for Operator Information parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Operator Information	0	1	1	1	0	0	0	0

Parameter field

Figure 3-40 illustrates the format of the Operator Information parameter field.

Figure 3-40
Format of the Operator Information parameter field

<table>
<tr><th></th><th colspan="8">Bits</th></tr>
<tr><th></th><th>8</th><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th></tr>
<tr><td>Octet 1</td><td colspan="8">Operator number</td></tr>
<tr><td>Octet 2</td><td colspan="2">Reorigination Type</td><td colspan="6">Operator number</td></tr>
<tr><td>Octet 3</td><td>OPR</td><td colspan="7">Entry code</td></tr>
<tr><td>Octet 4</td><td>TAC</td><td colspan="7">Trouble indicator</td></tr>
<tr><td>Octet 5</td><td>ODD/ EVEN</td><td>Bridge Reorig. Control*</td><td colspan="6">Action response</td></tr>
<tr><td>Octet 6</td><td colspan="4">Term route code</td><td colspan="4">Feat code</td></tr>
<tr><td>Octet 7</td><td colspan="2">UTR Digit*</td><td colspan="4">Reorigination trigger type*</td><td colspan="2">ANM Billing Indicator</td></tr>
<tr><td>Octet 8</td><td colspan="2">Reorig Allowed*</td><td>STR Digit*</td><td colspan="5">STR key duration at talking*</td></tr>
<tr><td>Octet 9</td><td colspan="2">Spare</td><td>Immed*</td><td colspan="5">STR key duration at non-talking*</td></tr>
<tr><td>Octet 10</td><td colspan="3">Spare</td><td colspan="5">Disconnect timer*</td></tr>
<tr><td>Octet 11</td><td colspan="4">Supplementary Digits</td><td colspan="4">Supplementary Digits</td></tr>
<tr><td>Octet 12</td><td colspan="8">Spare</td></tr>
</table>

Note: The fields denoted by an asterisk (*) are only valid when the REORIGINATION_TYPE field is 11. The Operator Information parameter includes these fields only for the Reorigination FAR, Redirecting FAR, and Bridging FAR.

Table 3-27 describes the codes in the Operator Information parameter field.

Table 3-27
Field codes for the Operator Information parameter

Field	Codes and Descriptions
Operator number	Operator number range: 0–4096
Reorigination type	type of reorigination behavior for the call
	00 = the originator receives a dial tone
	01 = the switch uses the originally dialed number to immediately translate and route the reoriginated call (boomerang reorigination)
	10 = this value prevents the switch from reoriginating call
	11 = reorigination Type
	Note: The Operator Information parameter includes the Reorigination Type field only for ANMs and FAR messages, and only when the switch includes the Enhanced Reorigination for Operator Services feature (ENSR0002) in the ON state; otherwise, the field is spare.
Entry code	Indicates the charge class that the operator entered:
	0000000 = default (00)
	0000001 = operator-initiated Call (01)
	0010100 = station paid, operator-assisted (20)
	0010110 = station special calling (22)
	0010111 = person paid (23)
	0011001 = person special calling (25)
	0101000 = station paid overseas, international (40)
	0111100 = station paid, operator-assisted (60)
	0111110 = station special calling, international (62)
	0111111 = person paid, international (63)
	1000001 = person special calling, international (65)
	Note: Other entry codes do not affect RLT functionality.
OPR	A one-bit indicator for operator reorigination (OPR) indicator

—continued—

Table 3-27
Field codes for the Operator Information parameter (continued)

Field	Codes and Descriptions
Trouble indicator	Indicates type of operator trouble: 0000 = none 0001 to 1111 = spare
TAC	A one-bit time and charge (TAC) request indicator: 0 = no request 1 = time and charge requested
Action response	Code for operator action response information
Bridge Reorig Control	Specifies whether or not the bridging switch bridges the call regardless of the result of allocation of reorigination resources based on the other reorigination fields. 0 = The reorigination resources allocation has no impact on bridging the call. The call is to be bridged even if the switch fails to allocate the resources for reorigination (N). 1 = The call will not be bridged if the resources could not be successfully setup (Y). ***Note:*** This field is part of the reorigination fields; therefore if the Reorigination Type field is not 11, this field is not used.
Odd/Even	Indicates an odd or even number of nibbles
Feat code	Indicates the operator information feature code
Term route code	Code for operator’s terminator routes
ANM Billing Indicator	00 = (Default) No external control; RLT_FIRST_ANM_BILLING determines first- or last-ANM billing. 01 = external control; bill from first ANM 10 = external control; bill from last ANM 11 = spare

—continued—

Table 3-27
Field codes for the Operator Information parameter (continued)

Field	Codes and Descriptions
Reorigination Trigger Type	Specifies when and how to invoke call reorigination. If the originating trunk of the call in the Origination switch is a non-AXXESS trunk, such as DAL, FGA, FGB, FGC, PTS FGD or SS7 FGD: 0000 = as provisioned at the Originating switch (0) 0001 = AUTO (1) 0010 = MANUAL (2) 0001 – 1111 = not supported (3–15) ***Note:*** This field is part of the reorigination fields; if the Reorigination Type field is not 11, this field is not used. ***Note:*** AUTO identifies that reorigination occurs automatically after disconnect of the called party. MANUAL identifies that reorigination occurs only if the octathorpe key (#) is pressed during the ringing state of the call, the talking state (for using STR only), or within the time specified by the field PSPDSEIZ in table TRKSGRP after called party disconnects. The receiver used to scan the octathorpe key is identified by the REORIG_RECEIVERS office parameter in table OFCVAR. The following codes apply if the originating trunk of the call in the Originating switch is an AXXESS trunk: 0000 = as provisioned at the Originating switch (0) 0001 = ONDISC (1) 0010 = ONKEY STR and UTR (2) 0011 = ONKEY STR (3) 0100 = ONKEY UTR (4) 0101 = ONKEY STR and ONDISC (5) 0110 = ONKEY UTR and ONDISC (6) 0111 = ONKEY STR and UTR and ONDISC (7) 1000 – 1111 = not supported (8–15)

—continued—

Table 3-27
Field codes for the Operator Information parameter (continued)

Field	Codes and Descriptions
	Note: ONDISC identifies that reorigination occurs immediately after disconnect of the called party or following expiration of the delay timer identified by the Disconnect Timer field. ONKEY identifies that reorigination occurs when the reorigination key is pressed during the ringing state of the call, the talking state (for STR only), or within the time specified by the Disconnect Timer value after called party disconnect occurs. STR and UTR are the receivers used to scan and detect when the reorigination key is pressed.
UTR Digit	Specifies the digit that is to be pressed in order to reoriginate the call when using a UTR receiver. 00 = represents one asterisk digit (*) (S) 01 = represents two asterisk digit (**) (SS) 10 = represents one octathorpe digit (#) (P) 00 = spare ***Note:*** If Reorigination Trigger Type is not used or does not specify ONKEY UTR, this field is not used. ***Note:*** This field is part of the reorigination fields; if Reoriginating type is not 11, this field is not used. ***Note:*** If the originating trunk of the call in the Originating switch is a non-AXXESS trunk, this field is not used. The only reorigination digit allowed for non-AXXESS trunks is the octathorpe digit (#).
STR Key Duration at Talking	Specifies the length of time in 100ms increments that the reorigination digit must be pressed in order to reoriginate the call when using an STR receiver during the talking state of the call. Range is 0 to 31. ***Note:*** If Reorigination Trigger Type is not used or does not specify ONKEY STR, this field is not used. ***Note:*** This field is part of the reorigination fields; if Reoriginating type is not 11, this field is not used.

—continued—

Table 3-27
Field codes for the Operator Information parameter (continued)

Field	Codes and Descriptions
STR Digit	Specifies the digit that is to be pressed in order to reoriginate the call when using an STR receiver. 0 = represents one asterisk digit (*) (S) 1 = represents one octathorpe digit (#) (P) ***Note:*** If Reorigination Trigger Type is not used or does not specify ONKEY STR, this field is not used. ***Note:*** This field is part of the reorigination fields; if Reoriginating type is not 11, this field is not used. ***Note:*** If the originating trunk of the call in the Originating switch is a non-AXXESS trunk, this field is not used as the only reorigination digit allowed for non-AXXESS trunks is the octathorpe digit (#).
Reorig Allowed	Specifies the reorigination type allowed. 00 = no change to the reorigination type allowed at the Origination switch 01 = normal reorigination allowed 10 = boomerang reorigination allowed 11 = spare ***Note:*** This field is part of the reorigination fields; if Reoriginating type is not 11, this field is not used. ***Note:*** Boomerang reorigination will not occur unless the ENSR0002 “ENSR Enhanced Reorig” SOC is in the ON state; otherwise, the value 10 boomerang reorigination is processed as same as the value 01 normal reorigination.

—continued—

Table 3-27
Field codes for the Operator Information parameter (continued)

Field	Codes and Descriptions
STR Key Duration at non-Talking	Specifies the length of time in 100ms increments that the reorigination digit must be pressed in order to reoriginate the call when using an STR receiver during the non-talking state of the call. Range is 1 to 31. ***Note:*** If Reorigination Trigger Type is not used or does not specify ONKEY STR, this field is not used. ***Note:*** This field is part of the reorigination fields; if Reoriginating type is not 11, this field is not used. ***Note:*** If the originating trunk of the call in the Originating switch is a non-AXXESS trunk, this field is not used because the REORIG_DIGIT_DURATION office parameter has specified the STR reorigination key duration used for non-AXXESS trunk groups.
Immed	Specifies if the reorigination is to immediately occur upon called party disconnect or delay a period of time. 0 = disconnect timer delays automatic triggering of reorigination (N) 1 = reorigination immediately occurs upon called party disconnected (Y) ***Note:*** If Reorigination Trigger Type is not used or does not specify ONDISC, this field is not used. ***Note:*** This field is part of the reorigination fields; if Reoriginating type is not 11, this field is not used. ***Note:*** If the originating trunk of the call in the Originating switch is a non-AXXESS trunk, this field is not used. This occurs because for non-AXXESS trunks, the reorigination occurs immediately after the called party disconnected when Reorigination Trigger Type is AUTO.

—continued—

Table 3-27
Field codes for the Operator Information parameter (continued)

Field	Codes and Descriptions
Disconnect Timer	For ONKEY, this field represents the amount of time in seconds that the subscriber has to press the reorigination digit to reoriginate a call after the called party disconnects. If reorigination ONDISC is enabled and Immed is 0, this field identifies the amount of time to delay after called party disconnect before reorigination automatically occurs. For example, this timer value marks the transition from ONKEY to ONDISC reorigination support. Range is 0–31. ***Note:*** If Reorigination Trigger Type is 0000 or spare, this field is not used. ***Note:*** This field is part of the reorigination fields; if Reoriginating type is not 11, this field is not used. ***Note:*** If the originating trunk of the call in the Originating switch is a non-AXXESS trunk, this field is not used because the field PSPDSEIZ in the table TRKSGRP provides the timer value for non-AXXESS trunk groups.
Spare	These are spare bits for optional use in future releases.
—end—	

Operator Service Indicator parameter

The Operator Service Indicator parameter is an optional IAM parameter. When a call's terminator is an ISUP IMT with RLT capability, a UCS DMS-250 switch includes this parameter in an outgoing IAM to another UCS DMS-250 switch. This parameter indicates that a call requires the switch to perform a charge rating lookup operation based on information (such as the ANICLAS and PANICLAS fields) in the originating trunk group.

Parameter code

The hexadecimal code for the Operator Service Indicator parameter is 74. Figure 3-41 shows the binary equivalent for the hexadecimal code.

Figure 3-41
Binary code for the Operator Service Indicator parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Operator Service Indicator	0	1	1	1	0	1	0	0

Parameter field

Figure 3-42 illustrates the format of the Operator Service Indicator parameter field.

Figure 3-42
Format of the Operator Service Indicator parameter field

<table>
<tr><td></td><td colspan="8">Bits</td></tr>
<tr><td></td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr>
<tr><td>Octet 1</td><td colspan="4">Party</td><td colspan="4">Spare</td></tr>
<tr><td>Octet 2</td><td colspan="6">Length</td><td colspan="2">Rating</td></tr>
</table>

Table 3-28 describes the codes in the Operator Service Indicator parameter.

Table 3-28
Field codes for Operator Service Indicator parameter

Field	Codes and descriptions
Service indicator	0000000 = default 0000001 = charge rating 0000010 to 1111111 = spare
Rating	00 = no rating 01 = auto rating 10 = spare 11 = spare

Originating Line Information parameter

The UCS DMS-250 switch encodes the Originating Line Information parameter only when origination occurs on an FGD, FGB, FGC, or pseudo-ANI (PANI) call. Switches include this optional parameter in IAM and FAR messages. The parameter is one byte long.

When a UCS DMS–250 switch receives this parameter in a FAR message, the information is captured in the SERVFEAT field of the OSR for the call.

Parameter code

The hexadecimal code for the Originating Line Information parameter is EA. Figure 3-43 shows the binary equivalent for the hexadecimal code.

Figure 3-43
Binary code for Originating Line Information parameter

Bits	8	7	6	5	4	3	2	1
Originating Line Information	1	1	1	0	1	0	1	0

Parameter field

Figure 3-44 illustrates the format of the Originating Line Information parameter field.

Figure 3-44
Format of the Originating Line Information parameter field

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Octet 1	Originating Line Information							

Table 3-29 describes the codes in the Originating Line Information parameter.

Table 3-29
Field codes for Originating Line Information parameter

Value	Description	Code
	DTMF:	
00000000	Identified line, no special treatment	(00)
00000001	ONI Multiparty	(01)
00000010	ANI failure (unavailable)	(02)
00000110	Hotel without room identification	(06)
00000111	Coinless, hospital, or inmate	(07)
00001000	InterLATA restricted	(08)
00010100	AIOD (listed DN sent)	(14)
00011011	Coin line	(1B)
01000100	InterLATA restricted (hotel)	(44)
01001110	InterLATA restricted (coinless)	(4E)

Supplementary Line Information parameter

The Supplementary Line Information parameter in an IAM instructs a switch to include a Call Reference parameter in the ACM or ANM. Switches include this optional parameter when the services platform can request RLT bridging.

In an IAM message for a third-party interaction or services platform callback call, this parameter performs either of the following functions:

- identifies the call as a callback
- indicates that the receiving switch must include a Call Reference parameter in the ACM or ANM (if the switch does not send an ACM)

Parameter code

The hexadecimal code for the Supplementary Line Information parameter is E4. Figure 3-45 shows the binary equivalent for the hexadecimal code.

Figure 3-45
Binary code for Supplementary Line Information parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Supplementary Line Information	1	1	1	0	0	1	0	0

Parameter field

Figure 3-46 illustrates the format of the Supplementary Line Information parameter field.

Figure 3-46
Format of the Supplementary Line Information parameter field

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Octet 1	Supplementary Line Information							

Table 3-30 describes the codes in the Supplementary Line Information parameter.

Table 3-30
Field codes for Supplementary Line Information parameter

Value	Codes and descriptions
11111000	RLT call operation
11111001	RLT call back call

Transit Network Selector parameter

The Transit Network Selector parameter identifies the networks that the switch requested to route the call. The parameter defines the type of network, the network ID plan, and the network ID. Switches send this optional parameter in the IAM.

This parameter’s Reoriginated Call field identifies whether the call is a boomerang reorigination (that is, whether the switches used the original dialed number to translate and route the call). For an explanation of the boomerang origination scenario, see Chapter 5, “RLT call scenarios for ESP.”

Parameter code

The hexadecimal code for the Transit Network Selector parameter is 23. Figure 3-47 shows the binary equivalent for the hexadecimal code.

Figure 3-47
Binary code for Transit Network Selector parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Transit Network Selector	0	0	1	0	0	0	1	1

Parameter field

Figure 3-48 illustrates the format of the Transit Network Selector parameter field.

Figure 3-48
Format of the Transit Network Selector parameter field

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Octet 1	Reorig	Network ID type			Network ID plan			
Octet 2	Digit 2				Digit 1			
Octet 3	Circuit code				Digit 3			

Table 3-31 describes the codes in the Transit Network Selector parameter.

Table 3-31
Field codes for Transit Network Selector parameter

Field	Codes and descriptions
Reoriginated Call	0 = a switch either did not reoriginate the call or reoriginated it. 1 = a switch used the originally dialed number to immediately translate and route the reoriginated call (boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reoriginated Call field only in IAMs, and only when the UCS DMS-250 switch includes the Enhanced Reorigination for Operator Services feature (ENSR0002); otherwise, the field is spare.
Network ID type	000 = CCITT-standardized identification 010 = national network identification
Network ID plan	0000 = unknown 0001 = carrier Identification Code (CIC) with Circuit Code

Table 3-31
Field codes for Transit Network Selector parameter

Field	Codes and descriptions
Digits 1-3	BCD equivalent of the CIC
Circuit code	0000 = unspecified
	0001 to 0111 = spare (coded as zero)
	1000 to 1111 = reserved for network specific use

User Service Information parameter

The User Service Information parameter defines the calling party's request for bearer capability. It includes the following call requirements:

- coding standard
- information transfer capability
- transfer mode
- information transfer rate

Switches send this mandatory, variable-length parameter in an IAM.

Parameter code

The hexadecimal code for the User Service Information parameter is 1D. Figure 3-49 shows the binary equivalent for the hexadecimal code.

Figure 3-49
Binary code for User Service Information parameter

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
User Service Information	0	0	0	1	1	1	0	1

Parameter field

Figure 3-50 illustrates the format of the User Service Information parameter field.

Figure 3-50
Format of the User Service Information parameter field

	Bits							
	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Octet 1	1	Coding standard		Information transfer capability				
Octet 2	Ext	Transfer mode		Information transfer rate				

Table 3-32 describes the codes in the User Service Information parameter.

Table 3-32
Field codes for User Service Information parameter

Field	Codes and descriptions
Coding standard	00 = CCITT-standardized 01 = reserved for international 10 = national standard 11 = reserved
Information transfer capability	00000 = speech
Extension bit	0 = octet continues through next octet 1 = this is the last octet

Table 3-32
Field codes for User Service Information parameter

Field	Codes and descriptions
Transfer mode	00 = Circuit mode 01 = reserved 10 = Packet mode 11 = reserved
Information transfer rate	00000 = Channel size 10000 = 64 kbit/s 10011 = 384 kbit/s

Common RLT call scenarios

This chapter summarizes the flow of Signaling System 7 (SS7) Integrated Services Digital Network (ISDN) User Part (ISUP) messages between UCS DMS-250 switches and a services platform that supports Release Link Trunk (RLT) capabilities. An Enhanced Services Provider (ESP) is a services platform.

An ESP is a software system that provides specialized switching, billing, and call processing features.

This chapter provides high-level diagrams and message flow diagrams for each of the common RLT call scenarios. Each message flow diagram illustrates the SS7 ISUP messaging between a bridging UCS DMS-250 switch, a remote UCS DMS-250 switch, and a services platform. The message flow diagrams highlight parameters that the ISUP messages contain. For technical descriptions of messages and parameters, refer to Chapter 3, “SS7 ISUP RLT messages and protocol.”

Note: The remote switch shown in the diagrams can also be the bridging switch under the proper conditions. For clarity, however, the bridging and remote switches in this chapter’s explanations are not the same switch. Even when the remote switch is the bridging switch, each scenario remains essentially the same.

The scenarios do not explain how a UCS DMS-250 switch generates billing records for each RLT call. For billing information, refer to Chapter 7, “Billing for RLT calls.”

The following RLT call scenarios are described in this chapter:

- services platform redirect and transfer
- third-party interaction
- services platform-initiated call back
- reorigination scenario with bridging at originating switch
- reorigination scenario with bridging not at originating or services platform

Services platform redirect and transfer scenario

In this scenario, the services platform transfers the call to its destination and requests release link trunking. After the appropriate switch bridges the call, the release link trunking capability frees the services platform and the remote switch.

The trunks connecting the bridging switch, the remote switch, and each services platform is an ISUP intermachine trunk (IMT) with RLT functionality. The trunk connecting the caller to the bridging switch is one of the following:

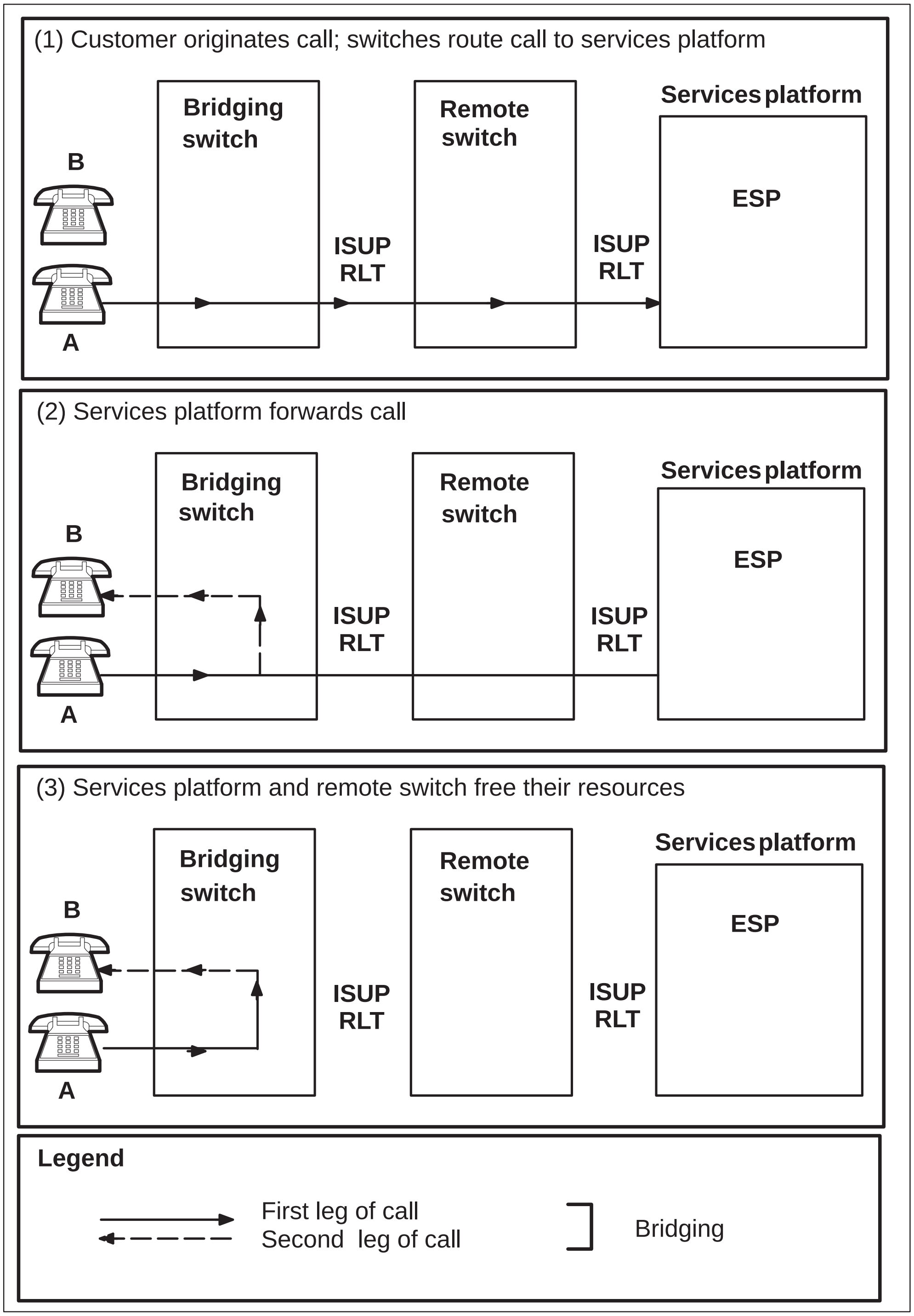
- a per-trunk signaling (PTS) trunk
- a primary rate interface (PRI) trunk
- an ISUP FGD trunk
- an ISUP IMT without RLT functionality

By definition, a switch only bridges a call when it cannot remove itself from the connection by passing the bridge request to another switch.

Note: PRI trunks and ISUP IMTs do not support call reorigination.

Figure 4-1 is a high-level diagram of the services platform redirect and transfer scenario.

Figure 4-1
Services platform redirect and transfer scenario



Message flow for redirect and transfer scenario

Figure 4-2 is a comprehensive message flow diagram for the redirect and transfer scenario. It shows the sequence for the exchange of messages and parameters between the bridging switch, the remote switch, and the services platform.

Specifically, the message exchange occurs as follows:

1 A switch, the bridging switch in this scenario, receives the call. Based on the nature of the call, the bridging switch formats an Initial Address Message (IAM) and sends it to another switch, the remote switch in this scenario.

Note: If the call is an N00 services (700, 800, or 900) call, the switch performs N00 lookup (that is, it translates the N00 services call into a ten-digit number). The switch places the N00 number in the CDR's Dialed Number field and places the ten-digit number into the CDR's Called Number field.

2 In response to the IAM from the bridging switch, the remote switch sends another IAM to the services platform. Table 4-1 shows parameters in this IAM that affect RLT functionality.

Table 4-1
RLT parameters in the IAM

RLT parameter	Comments
Called Party Number	The switches use the number of the party called when generating billing records. The switches place this value in the Called Number field of the CDR for the call. This parameter also provides a Nature of Address (NOA) value that indicates whether the call is operator-assisted or whether the switch must treat the call.
Calling Party Number	This parameter contains an ANI value. The switches add this value to the ANI SPILL field in the call's CDR, unless they pull the ANI value from the Charge Number parameter.
Charge Number	This parameter contains an automatic numbering identification (ANI) value. If the IAM contains this parameter, the switches add this value to the ANI SPILL field in the call's CDR.

—continued—

Table 4-1
RLT parameters in the IAM (continued)

RLT parameter	Comments
Charge Number (continued)	If the IAM does not contain this parameter, the switches get the ANI value from the Calling Party Number parameter.
Generic Digits	This parameter contains the CALLID value that the services platform provided. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match OSRs on both the services platform and bridging switches.
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (refer to Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).
—end—	

3 The services platform returns an Address Complete Message (ACM) to the remote switch. The ACM confirms that the services platform received the information needed to route the call to its destination. The remote switch passes the ACM to the bridging switch.

4 When an ESP operator answers the call, the ESP sends an Answer Message (ANM) to the remote switch. The remote switch formats and sends another ANM to the bridging switch. Table 4-2 shows parameters in this ANM that affect RLT functionality.

Table 4-2
RLT parameters in the ANM

RLT parameter	Comments
Call Reference	This parameter holds the switch's call identification and point code values for a call.
Operator Information	This parameter's Reorigination Type field determines what type of reorigination, if any, the switches can perform for the call. This is true only if the Reorigination Type Location field in table OFCVAR is OPERINFO.

Note 1: The ANM includes a Call Reference or Operator Information parameter only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

Note 2: Only ESPs with proper programming return this parameter in ANMs.

Note 3: Depending on how the parameter is set up in table OFCVAR, the switch will look at either the Call Reference or Operator Information parameter to determine reorigination type.

5 The services platform identifies the called party, but does not make the call to that party. First, it initiates billing by sending a Facility Request (FAR) message to the remote switch. Table 4-3 shows parameters in this FAR message that affect RLT functionality.

Table 4-3
RLT parameters in the FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Start Billing Time value that the bridging switch uses.

6 The remote switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch.

7 The bridging switch also checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. In this scenario, the indicator starts billing.

Note 1: In this example, the services platform, remote, and bridging switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message's Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the bridging switch and the remote switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

8 To acknowledge that it received and processed the FAR message, the bridging switch formats a Facility Accept (FAA) message and sends it to the remote switch, which passes it to the services platform. Table 4-4 shows parameters in the billing FAA message that affect RLT functionality.

Table 4-4
RLT parameters in the FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the same Start Billing Time value that was in the FAR message.

9 The ESP initiates release link trunking, sending another FAR message to the remote switch. The remote switch passes the FAR to the bridging switch. Because the trunk connecting the bridging switch to the switch from which it originally received the call does not support RLT functionality, it reads the message's Facility Indicator and performs release link trunking. Using translations of the Called Party Number parameter, the bridging switch completes the second leg of the call. Table 4-5 shows parameters in this FAR message that affect RLT functionality.

Note: If the Called Party Number parameter contains an N00 services number, the switch supports boomerang reorigination. Refer to Chapter 5, "RLT call scenarios for ESP," for a description of boomerang reorigination.

Table 4-5
Important RLT parameters in this Redirect FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for Operator Redirect/Transfer value that the bridging switch uses.
Calling Party Number	The switches, except bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform provided. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match OSRs on both the services platform and bridging switches.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.

10 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the remote switch, which passes it to the services platform. Table 4-6 shows parameters in this FAA message that affect RLT functionality.

Table 4-6
Important RLT parameters in this Redirect FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the Release Link for Operator Redirect/Transfer value that was in the FAR message.
Call Reference	This parameter holds the switch’s call identification and point code values for a call.

11 After bridging the call, the bridging switch formats a Release (REL) message and sends it to the remote switch. The REL message includes a Normal Clearing Cause Indicator parameter.

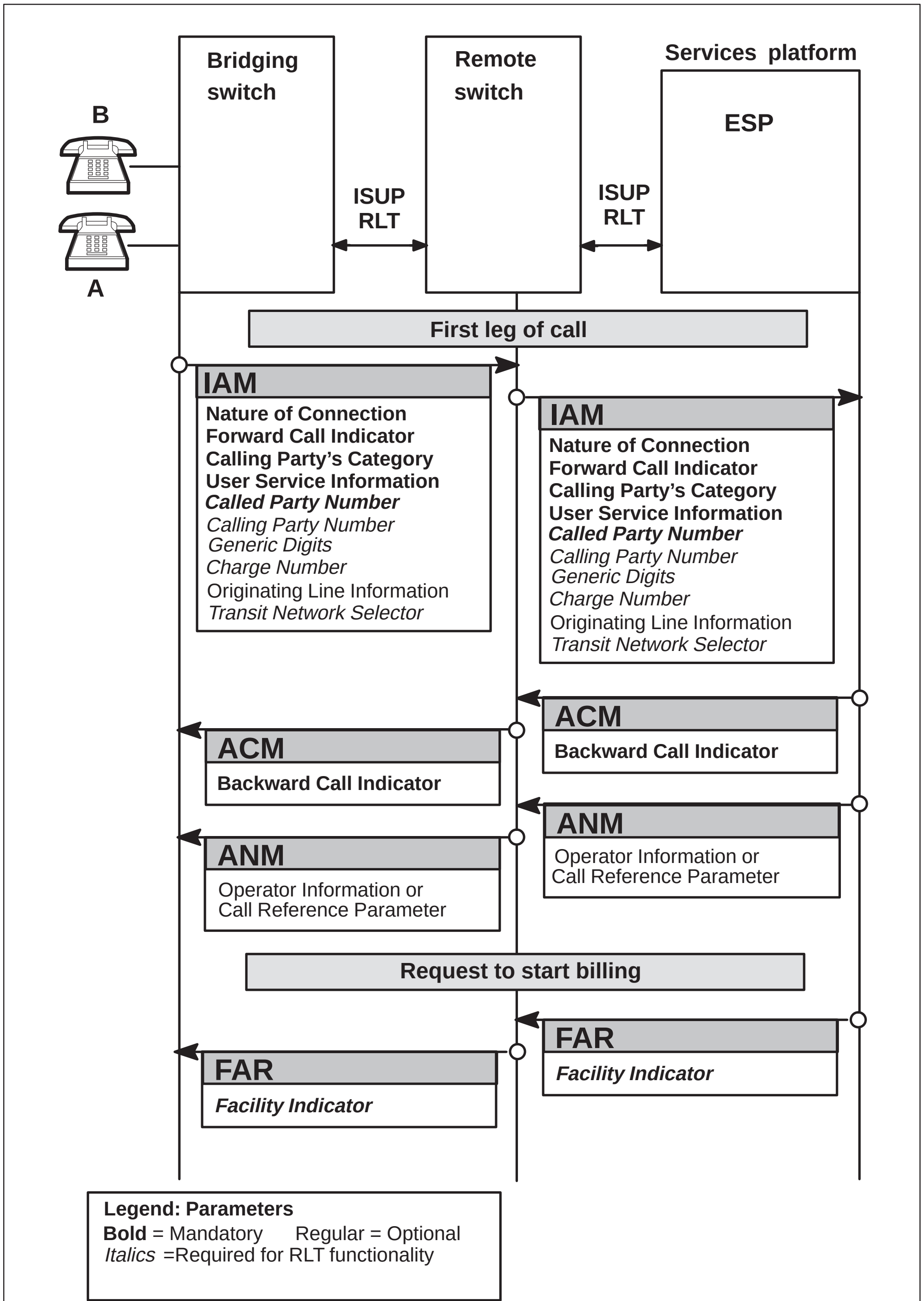
12 The remote switch sends another REL message to the services platform and releases the connection to the services platform and the corresponding trunks. It also sends a Release Complete (RLC) message back to the bridging switch to confirm the release. This RLC also includes a proper Cause Indicator parameter.

Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

13 The services platform also releases its connections and returns another RLC with a proper Cause Indicator to the remote switch to confirm the release.

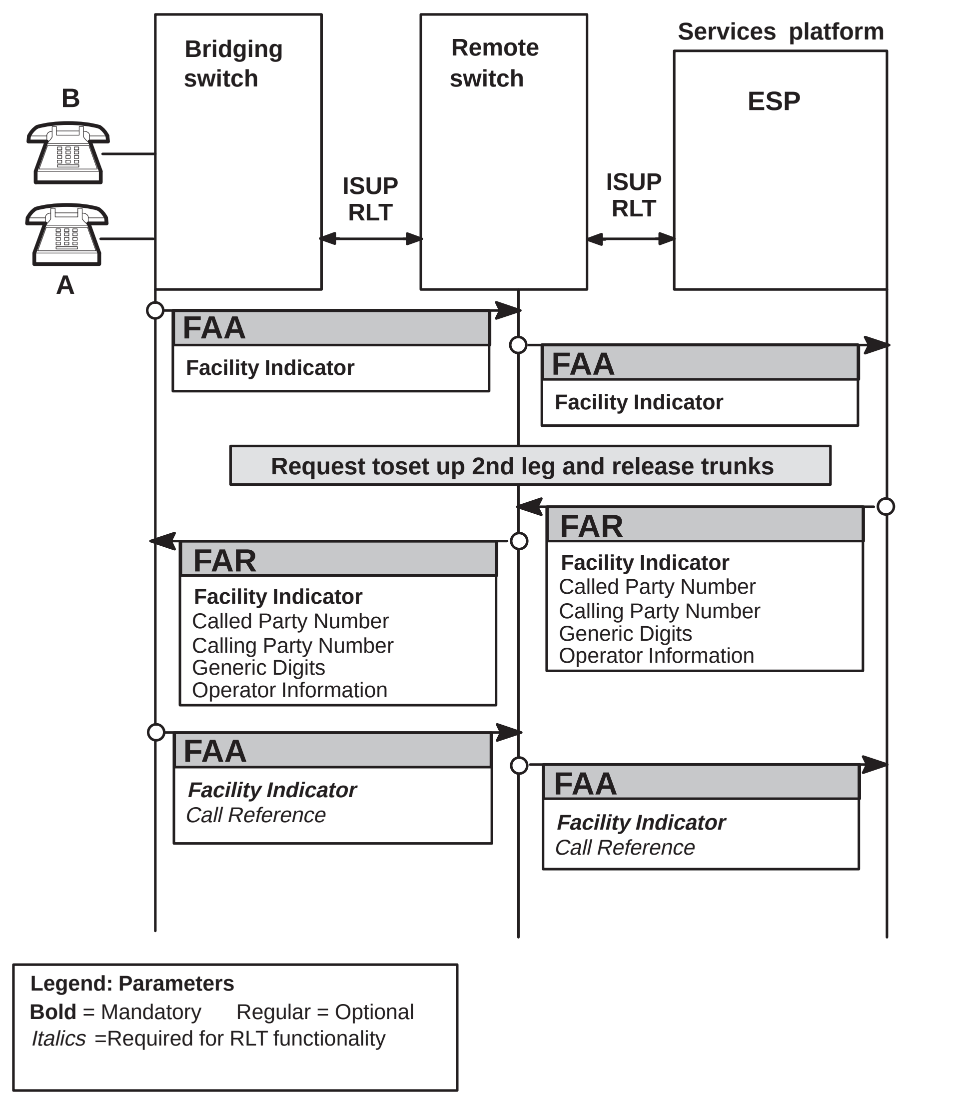
Figure 4-2 is a comprehensive message flow diagram for the redirect and transfer scenario.

Figure 4-2
Message flow for redirect and transfer scenario



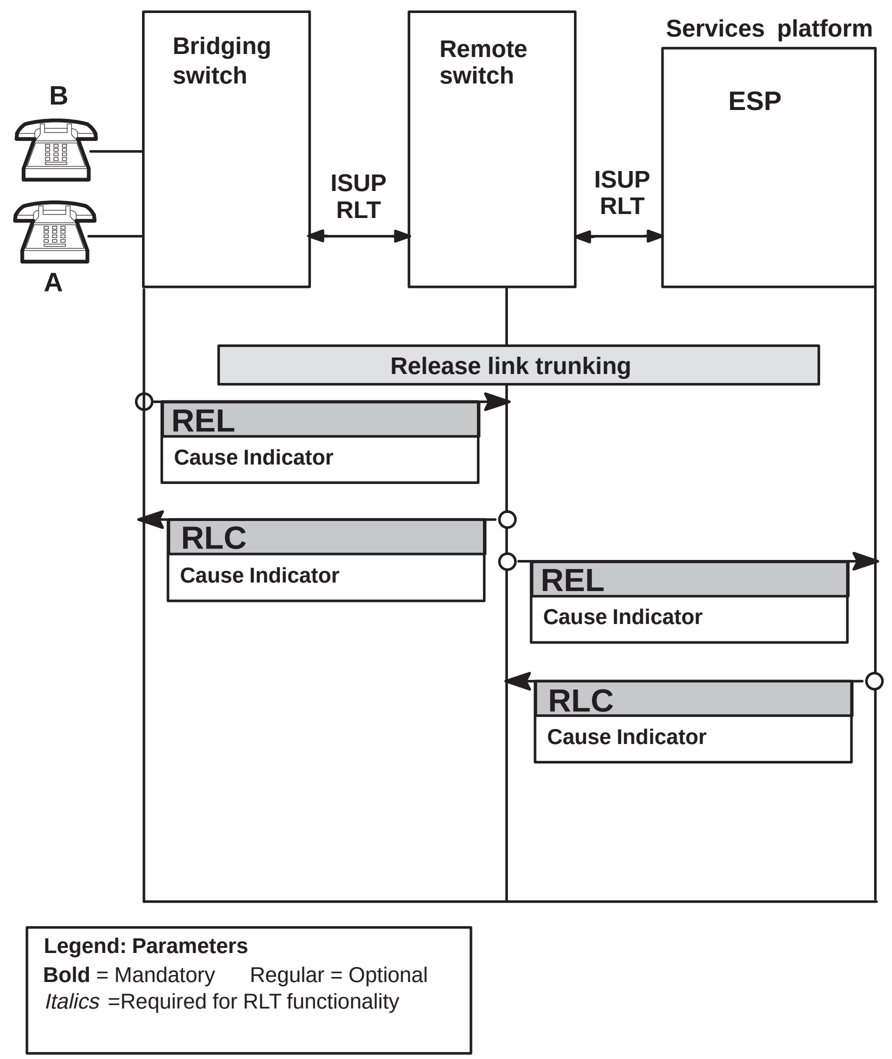
—continued—

Figure 4-2
Message flow for redirect and transfer scenario (continued)



—continued—

Figure 4-2
Message flow for redirect and transfer scenario (continued)



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ESP redirect and transfer error scenario

This section explains the message flow for the redirect and transfer scenario when, for whatever reason, a UCS DMS-250 switch cannot perform the action requested in the Facility Indicator parameter of a FAR message. In this case, the switch involved does not perform the action requested (such as release link trunking) and cannot complete the call. The switches must process the call using call treatment or other means. The error scenario is identical to the standard redirect and transfer scenario up to step 7.

Message flow for redirect and transfer error scenario

Figure 4-3 is a comprehensive message flow diagram for the redirect and transfer error scenario. It shows the sequence for the exchange of messages and parameters between the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform.

Specifically, the message exchange in this error scenario occurs as follows:

1 A switch, the bridging switch in this scenario, receives the call. The switches and services platform exchange messages just as in steps 1-6 in the standard redirect and transfer scenario.

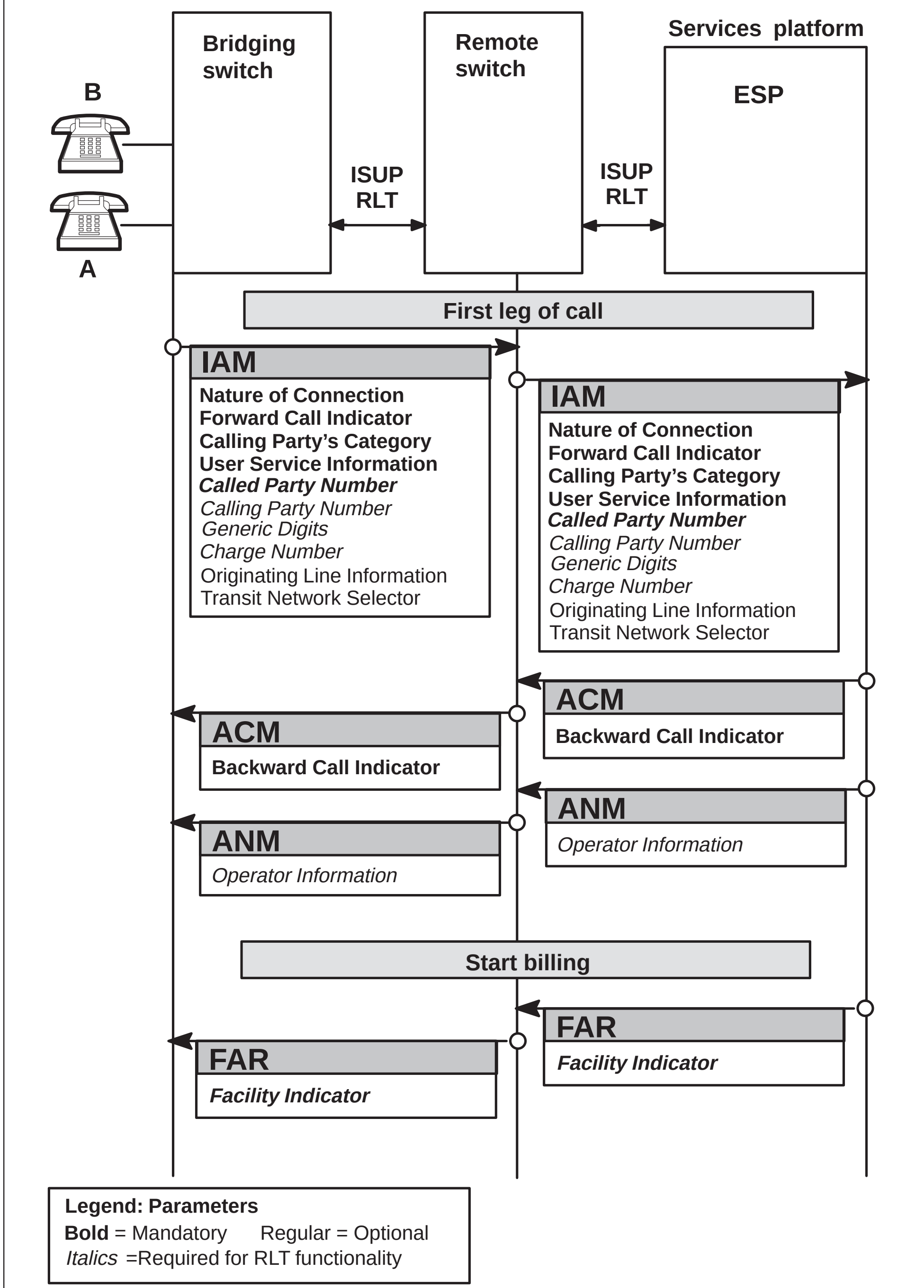
2 The bridging switch checks a FAR message from the services platform. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and tries to perform the action designated in the FAR message's Facility Indicator parameter. In this scenario, for whatever reason, the switch is unable to perform the action.

3 The switch that attempted bridging returns a Facility Reject (FRJ) message to the remote switch to indicate that it could not perform the facility request. This message's Cause Indicator parameter explains why the switch could not fulfill the request.

4 If the value of the Cause Indicator parameter is Switching Equipment Congestion, the remote switch attempts to bridge the call. If the Cause Indicator has some other value, or the remote switch cannot bridge the call for some other reason, then the remote switch passes the FRJ message to the services platform.

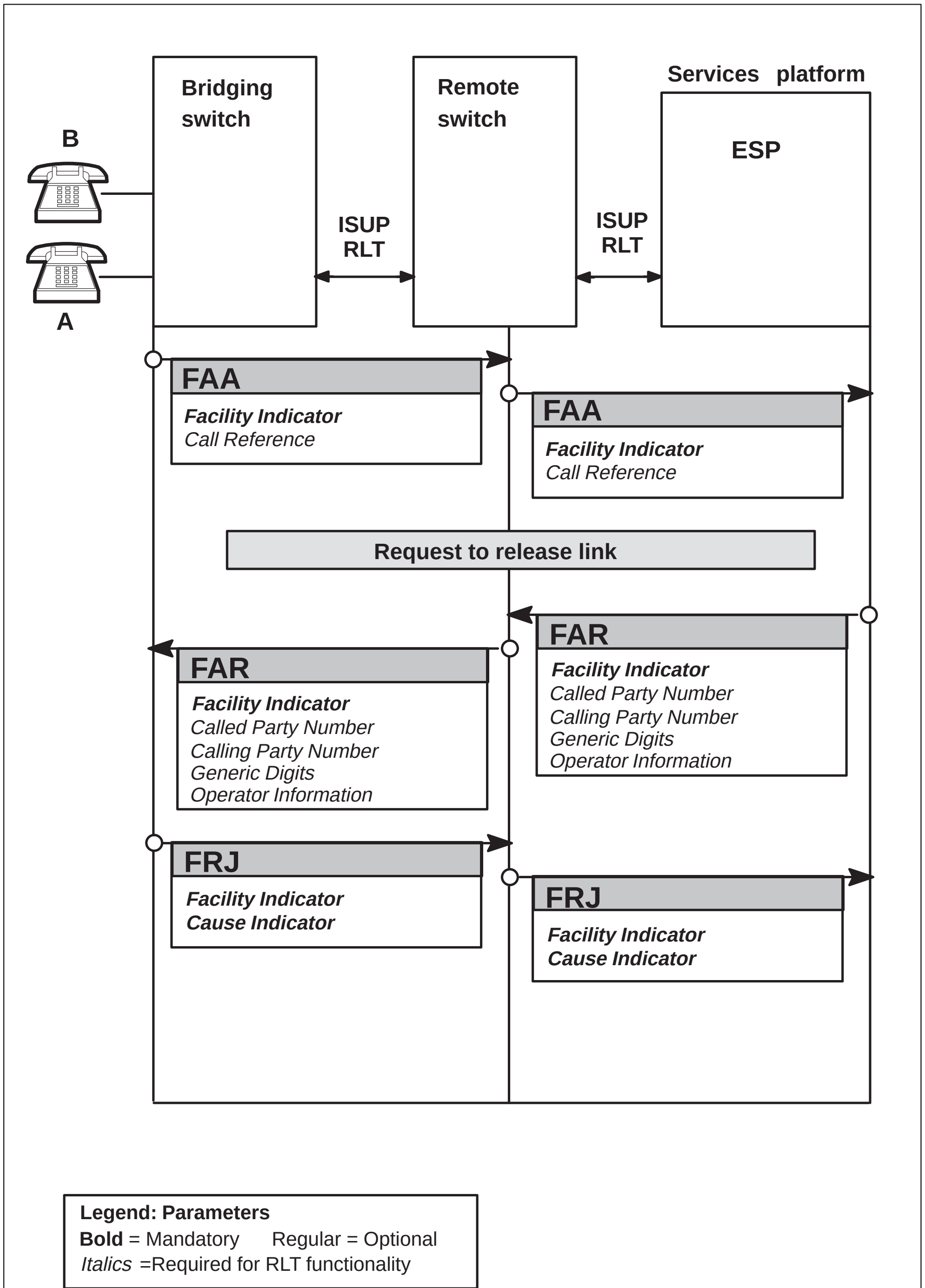
5 Until the call is completed, the services platform bridges the call and maintains connections on all of the trunks and switches that support both legs of the call.

Figure 4-3
Message flow for redirect and transfer error scenario



—continued—

Figure 4-3
Message flow for redirect and transfer error scenario (continued)



—end—

Third-party interaction scenario

In this scenario, a customer makes a call that requires the services platform to place the three-way call. When the parties are in conference, the services platform requests release link trunking. After the appropriate switch bridges the call, the release link trunking capability frees the services platform and the remote switch.

The trunks connecting the bridging switch, the remote switch, and the services platform are all ISUP IMTs with RLT functionality. The trunk connecting the caller to the bridging switch is one of the following:

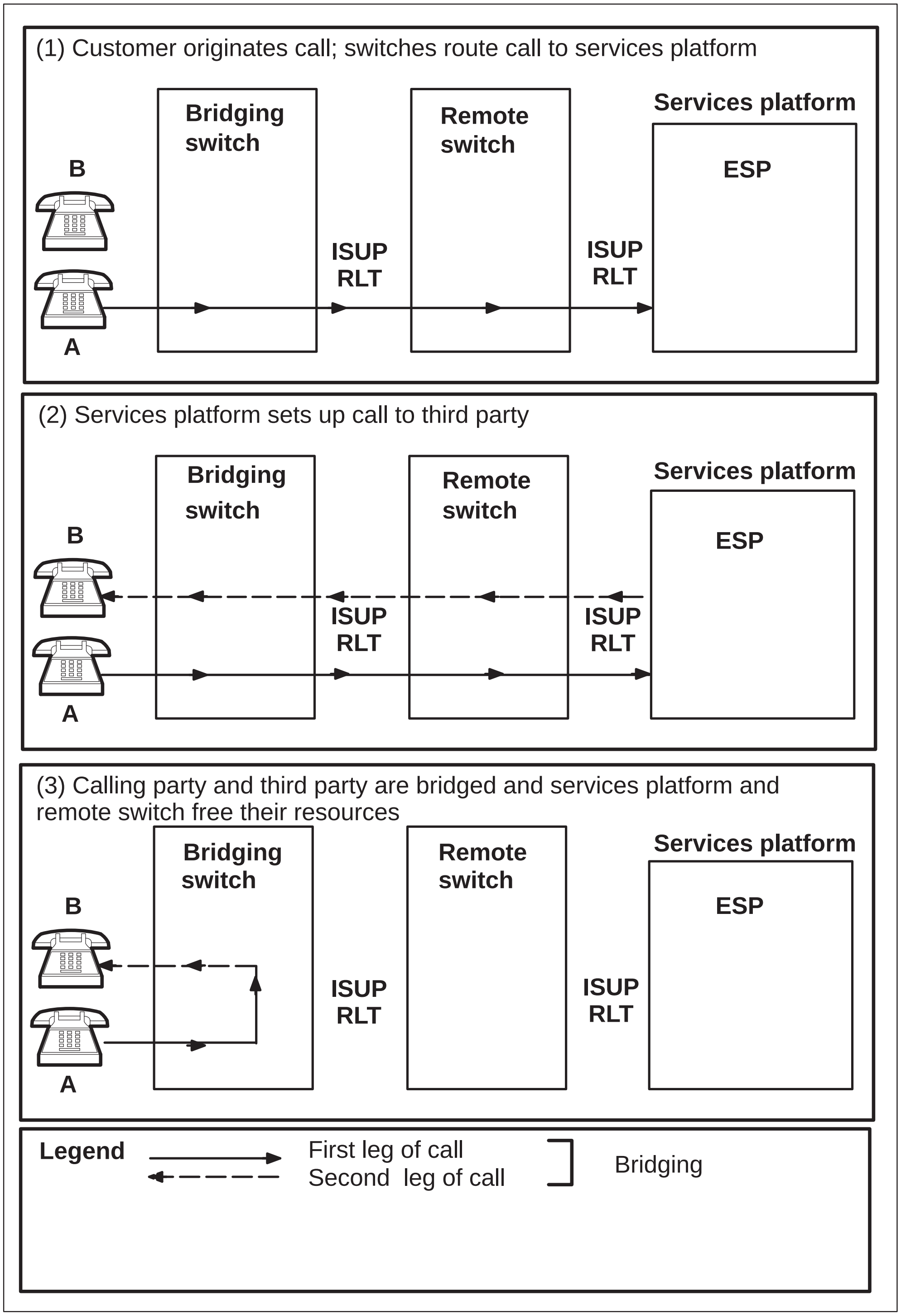
- a PTS trunk
- a PRI trunk
- an ISUP FGD trunk
- an ISUP IMT without RLT functionality

By definition, a switch only bridges a call when it cannot remove itself from the connection by passing the bridge request to another switch.

Note: PRI trunks and ISUP IMTs do not support call reorigination.

Figure 4-4 is a high-level diagram of the third-party interaction scenario.

Figure 4-4
Third-party interaction scenario



Message flow for third-party interaction

Figure 4-5 is a comprehensive message flow diagram for the third-party interaction scenario. The diagram shows the sequence for the exchange of messages between the bridging switch, the remote switch, and the services platform.

Specifically, the message exchange occurs as follows:

1 A switch, the bridging switch in this scenario, receives a call. Based on the nature of the call, the bridging switch formats an IAM and sends it to another switch, the remote switch in this scenario.

   Note: If the call is an N00 services call, the switch performs N00 lookup (it translates the N00 services call into a ten-digit number). The switch places the N00 number into the CDR's Dialed Number field and places the ten-digit number into the CDR's Called Number field.

2 In response to the IAM from the bridging switch, the remote switch sends another IAM to the services platform. Table 4-7 provides a list of parameters in the IAM that affect RLT functionality.

Table 4-7
RLT parameters in a first leg IAM

RLT parameter	Comments
Called Party Number	The UCS DMS–250 switches use the number of the party called when generating billing records. The switches place this value in the Called Number field of the CDR for the call. This parameter also provides an NOA value that indicates whether the call is operator-assisted or whether the switch must treat the call.
Charge Number	This parameter contains an ANI value. If the IAM contains this parameter, the switches add this value to the ANI SPILL field in the call's CDR. If the IAM does not contain this parameter, the switches get the ANI value from the Calling Party Number parameter.
—continued—	

Table 4-7
RLT parameters in a first leg IAM (continued)

RLT parameter	Comments
Calling Party Number	This parameter contains an ANI value. The switches add this ANI value to the ANI SPILL field in the call's CDR, unless they pull the ANI value from the Charge Number parameter.
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (refer to Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).
—end—	

3 The services platform returns an ACM to the remote switch. The ACM confirms that the services platform received the information needed to route the call to its destination. The remote switch passes the ACM to the bridging switch.

4 When the services platform answers the call, the platform sends an ANM to the remote switch. The remote switch formats and sends another ANM to the bridging switch. Table 4-8 shows parameters in this ANM that affect RLT functionality.

Table 4-8
Important RLT parameters in this ANM

RLT parameter	Comments
Operator Information	This parameter provides operator information to the bridging switch which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields of the OSR for the call. This parameter's Reorigination Type field determines what type of reorigination, if any, switches can perform for the call.

Note 1: The ANM includes a Call Reference or Operator Information parameter only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

Note 2: Only ESPs with proper programming return this parameter in ANMs.

5 The services platform identifies the called party and initiates the second leg of the call, formatting a new IAM and sending it to the remote switch. Because the trunk connecting the remote switch and the services platform supports RLT functionality, the IAM includes the Supplementary Line Information (SLI) parameter.

6 When it receives the IAM, the remote switch formats another IAM and sends it to the bridging switch. Because the trunk connecting the remote switch and the bridging switch supports RLT functionality, this IAM also includes the SLI parameter. Table 4-9 shows parameters in this IAM that affect RLT functionality.

Table 4-9
Important RLT parameters in this second leg IAM

RLT parameter	Comments
Called Party Number	The switches use the number of the party called when generating billing records. The switches place this value in the Called Number field of the CDR for the call. This parameter also provides an NOA value that indicates whether the call is operator-assisted or whether the switch must treat the call.
Calling Party Number	This parameter contains an ANI value. The switches add this ANI value to the ANI SPILL field in the call’s CDR, unless they pull the ANI value from the Charge Number parameter.
Charge Number	This parameter contains an ANI value. If the IAM contains this parameter, the switches add this value to the ANI SPILL field in the call’s CDR. If the IAM does not contain this parameter, the switches get the ANI value from the Calling Party Number parameter.
Generic Digits	This parameter contains the CALLID value that the services platform provided. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match OSRs on both the services platform and bridging switches.
Supplementary Line Information (SLI)	This parameter causes a receiving switch to include a Call Reference parameter in an ACM when it responds. In this scenario, this parameter has an RLT Call Operation value.
Transit Network Selector	This parameter’s Reorigination Call field identifies whether the call is a boomerang reorigination call (refer to Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

7 In response to the IAM with the SLI parameter, the bridging switch returns an ACM with a Call Reference parameter that identifies the second leg of the call. This ACM indicates that the terminating switch received the information that it needs to route the call.

8 The remote switch copies and saves the Call Reference parameter from the ACM. As each intermediate tandem switch passes this ACM, it replaces its own call identification and point code values with the values in this parameter. The switch routes this ACM to the services platform, which also saves the Call Reference parameter. Table 4-10 shows parameters in this ACM that affect RLT functionality.

Table 4-10
Important RLT parameters in this second leg ACM

RLT parameter	Comments
Call Reference	This parameter holds the switch's call identification and point code values for a call. The switches pass this information backward in a FAR message to the bridging switch to allow it to bridge the correct two calls.

9 When the terminating party of the second leg answers, the bridging switch formats an ANM and sends it to the remote switch. The remote switch passes the ANM to the services platform, connecting it in a three-way call with the calling party and called party.

10 The services platform initiates billing by sending a FAR message to the remote switch.

11 The remote switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch. Table 4-11 shows parameters in this FAR message that affect RLT functionality.

Table 4-11
Important RLT parameters in this Billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Start Billing Time value that the bridging switch uses.

12 The bridging switch also checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. In this scenario, the indicator starts billing.

Note 1: In this example, the services platform, remote, and bridging switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message's Facility Indicator parameter and performs the function that the parameter designates.

Note 2: If the trunk between the bridging switch and the remote switch in the scenario in Note 1 did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

13 To acknowledge that it received and processed the FAR message, the bridging switch formats an FAA message and sends it to the remote switch, which passes it to the services platform. Table 4-12 shows parameters in this FAA message that affect RLT functionality.

Table 4-12
Important RLT parameters in this billing FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the same Start Billing Time value that was in the FAR message.

14 The ESP initiates release link trunking, sending another FAR message to the remote switch.

Note: A services platform always sends a FAR message to the trunk circuit of the leg for which it does not have Call Reference information. In this scenario, the services platform sends the FAR message to the trunk of the call's first leg.

15 Using the information in the FAR message, the remote switch identifies the associated call (the second call leg). By examining the point codes for the trunks of each leg of the call, it also determines whether both legs connect to the bridging switch.

16 Because the point codes are the same, the remote switch retrieves the Call Reference information that it copied when it received the ACM from the bridging switch (see step 8). The remote switch adds this Call Reference information to a FAR message and sends the message to the bridging switch. Table 4-13 shows parameters in this FAR message that affect RLT functionality.

Table 4-13
Important RLT parameters in this third-party FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for 3rd Party Interaction Call value that the bridging switch uses.
Call Reference	This parameter holds the switch's call identification and point code values for a call. The bridging switch uses this information to bridge the correct two calls. ***Note:*** As each intermediate tandem switch passes this FAR message, it replaces this parameter's call identification and point code values with values received in an ANM or ACM.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the OSR.
Calling Party Number	The switches, except bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the call's OSR.

—continued—

Table 4-13
Important RLT parameters in this third-party FAR message

RLT parameter	Comments
Generic Digits	This parameter contains the CALLID value that the services platform provided. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match OSRs on both the services platform and bridging switches.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.

—end—

17 The bridging switch reads the message’s Facility Indicator and bridges the originating trunk of the first call leg to the terminating trunk of the second call leg. The bridging switch uses the information in the FAR message’s Call Reference parameter to identify the second leg.

18 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the remote switch, which passes it to the services platform. Table 4-14 shows parameters in this FAA message that affect RLT functionality.

Table 4-14
Important RLT parameters in this third-party FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote UCS DMS–250 switch. In this scenario, this parameter contains the Release Link for 3rd Party Interaction Call value that was in the FAR message.
Call Reference	This parameter holds the switch’s call identification and point code values for a call. The bridging switch uses this information to bridge the correct two calls.

19 After bridging the call, the bridging switch formats two REL messages and sends them to the remote switch to release the call connections for both call legs. The REL messages include Normal Clearing Cause Indicator parameters.

20 The remote switch sends two REL messages to the services platform and releases the call connections to the services platform and the corresponding trunks. It also sends two RLC messages back to the bridging switch to confirm the release of the first and second call legs. The RLC's also include proper Cause Indicator parameters.

Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

21 The services platform also releases its connections and returns two RLC's with proper Cause Indicator parameters to the remote switch to confirm the release of both call legs.

Figure 4-5 is a comprehensive message flow diagram for the third-party interaction scenario.

Figure 4-5
Message flow for third-party interaction scenario

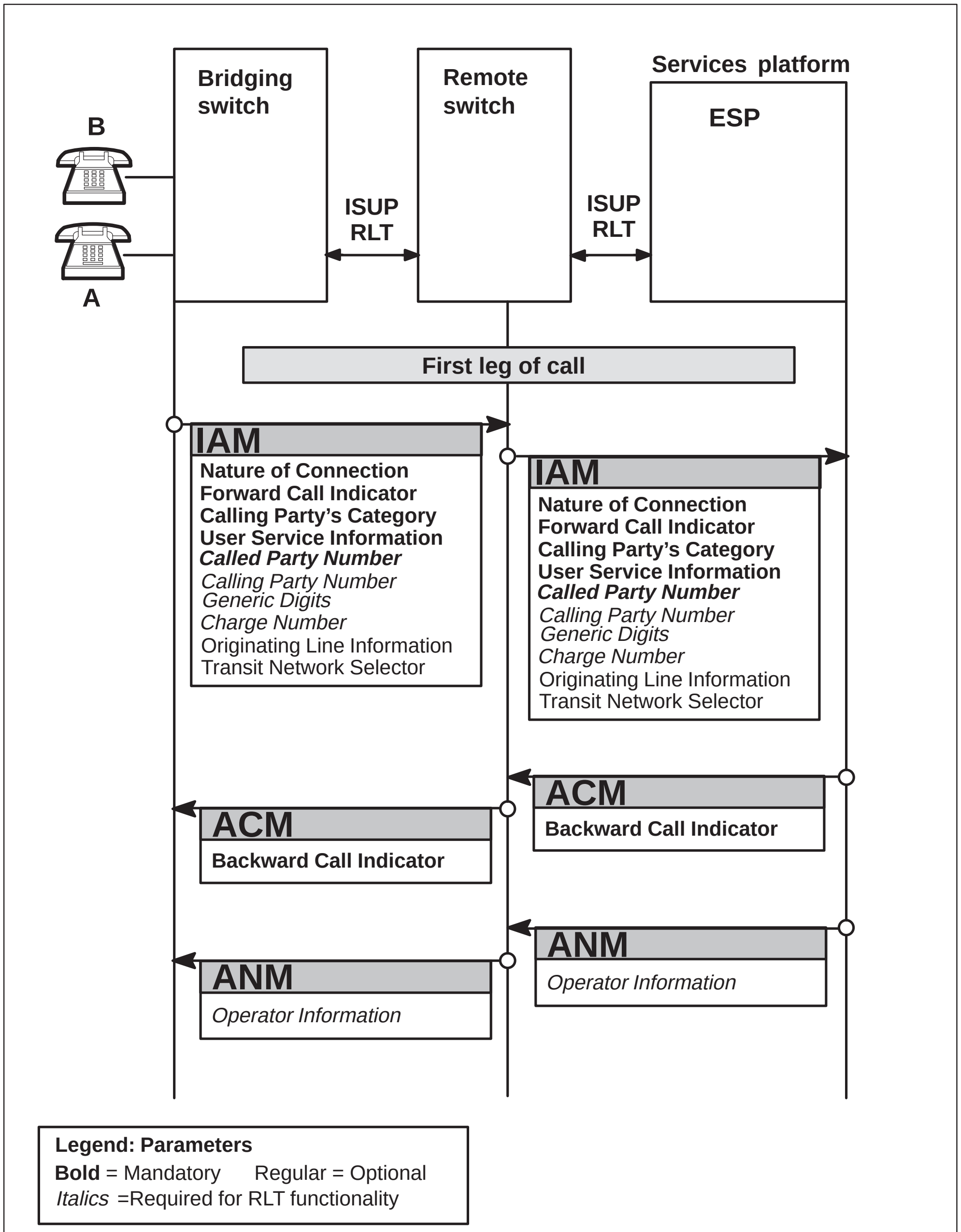


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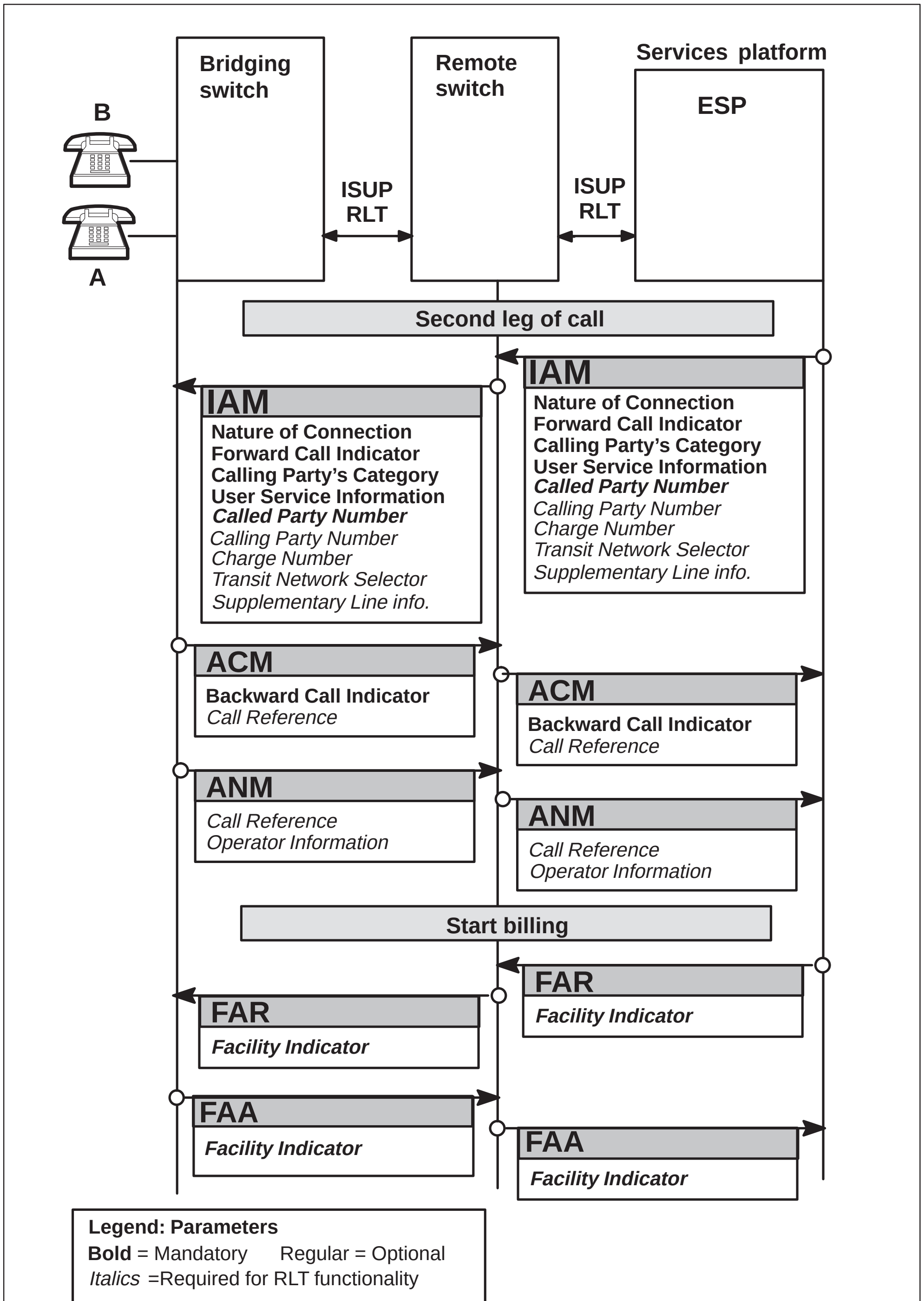
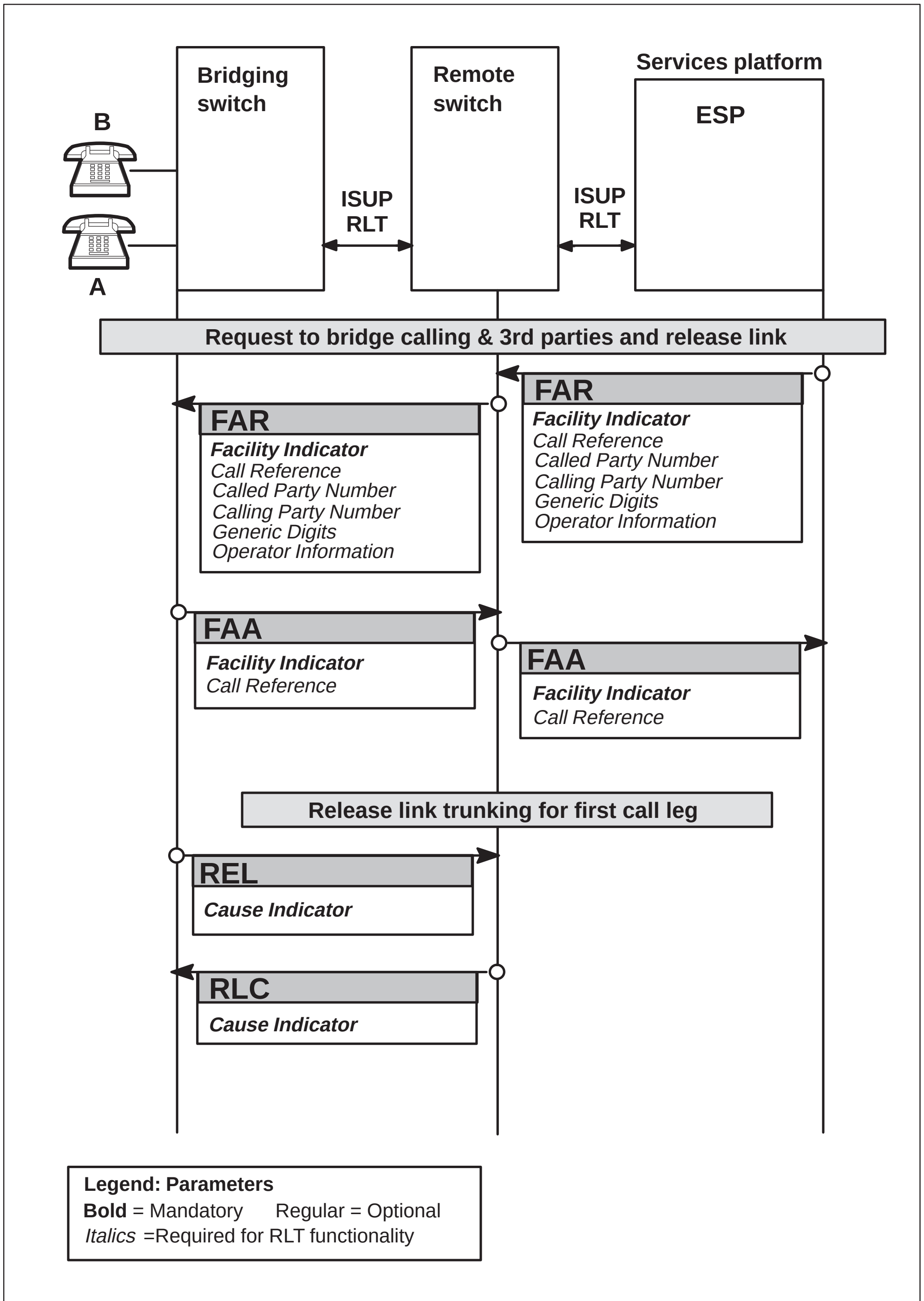
Figure 4-5
Message flow for third-party interaction scenario (continued)



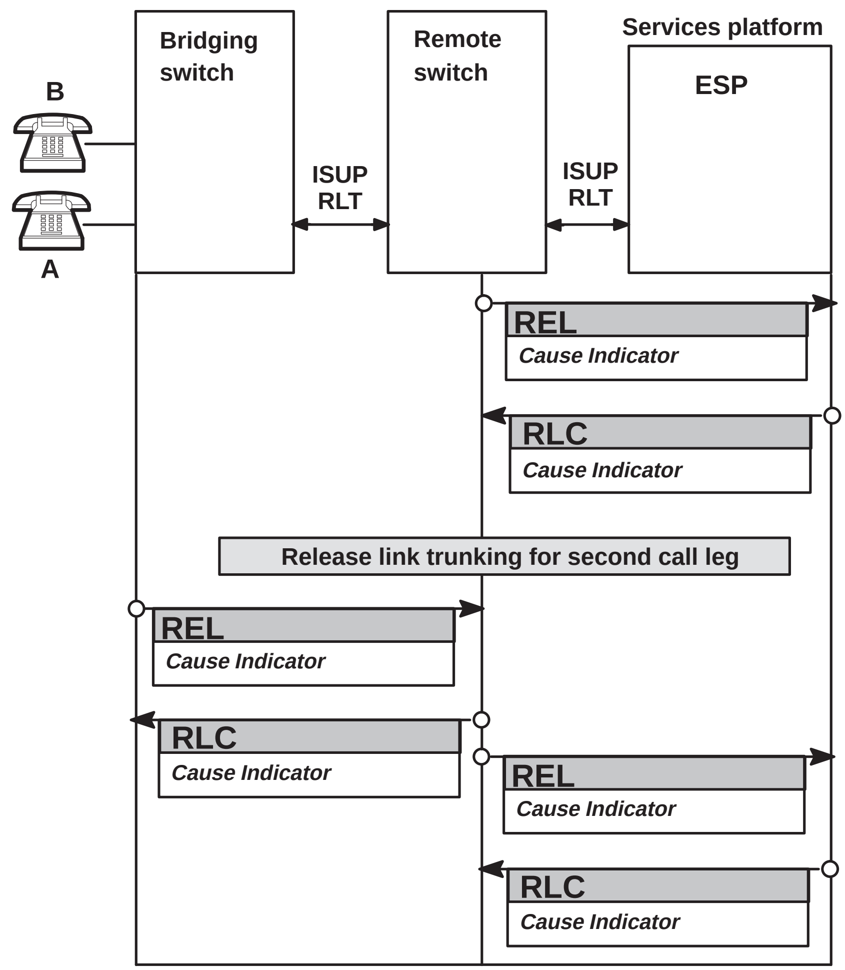
—continued—

Figure 4-5
Message flow for third-party interaction scenario (continued)



—continued—

Figure 4-5
Message flow for third-party interaction (continued)



Legend: Parameters
Bold = Mandatory Regular = Optional
Italics =Required for RLT functionality

—end—

Third-party interaction error scenario

This section explains the message flow for the third-party interaction scenario when, for whatever reason, a UCS DMS-250 switch or interconnecting trunk cannot perform the action requested in the Facility Indicator parameter of a FAR message. In this case, the switch involved does not perform the action requested (such as release link trunking), but may complete the call, depending on conditions. The error scenario is identical to the standard third-party interaction scenario up to step 16.

Message flow for third-party interaction error scenario

Figure 4-6 is a comprehensive message flow diagram for the third-party interaction error scenario. It shows the sequence for the exchange of messages and parameters between the bridging switch, the remote switch, and the services platform.

Specifically, the message exchange in this error scenario occurs as follows:

1. A switch, the bridging switch in this scenario, receives the call. The switches and services platform exchange messages just as in steps 1-16 in the standard third-party interaction scenario
2. The bridging switch checks a FAR message from the services platform. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and tries to perform the action designated in the FAR message's Facility Indicator parameter. In this scenario, for whatever reason, the switch is unable to perform the action.
3. The switch that attempted bridging returns an FRJ message to the remote switch to indicate that it could not perform the facility request. This message's Cause Indicator parameter explains why the switch could not fulfill the request.
4. If the value of the Cause Indicator parameter is Switching Equipment Congestion, the remote switch attempts to bridge the call. If the Cause Indicator has some other value, or the remote switch cannot bridge the call for some other reason, then the remote switch passes the FRJ message to the services platform.
5. Until the call is completed, the services platform bridges the call and maintains connections on all of the trunks and switches that support both legs of the call.

Figure 4-6
Message flow for third-party interaction error scenario

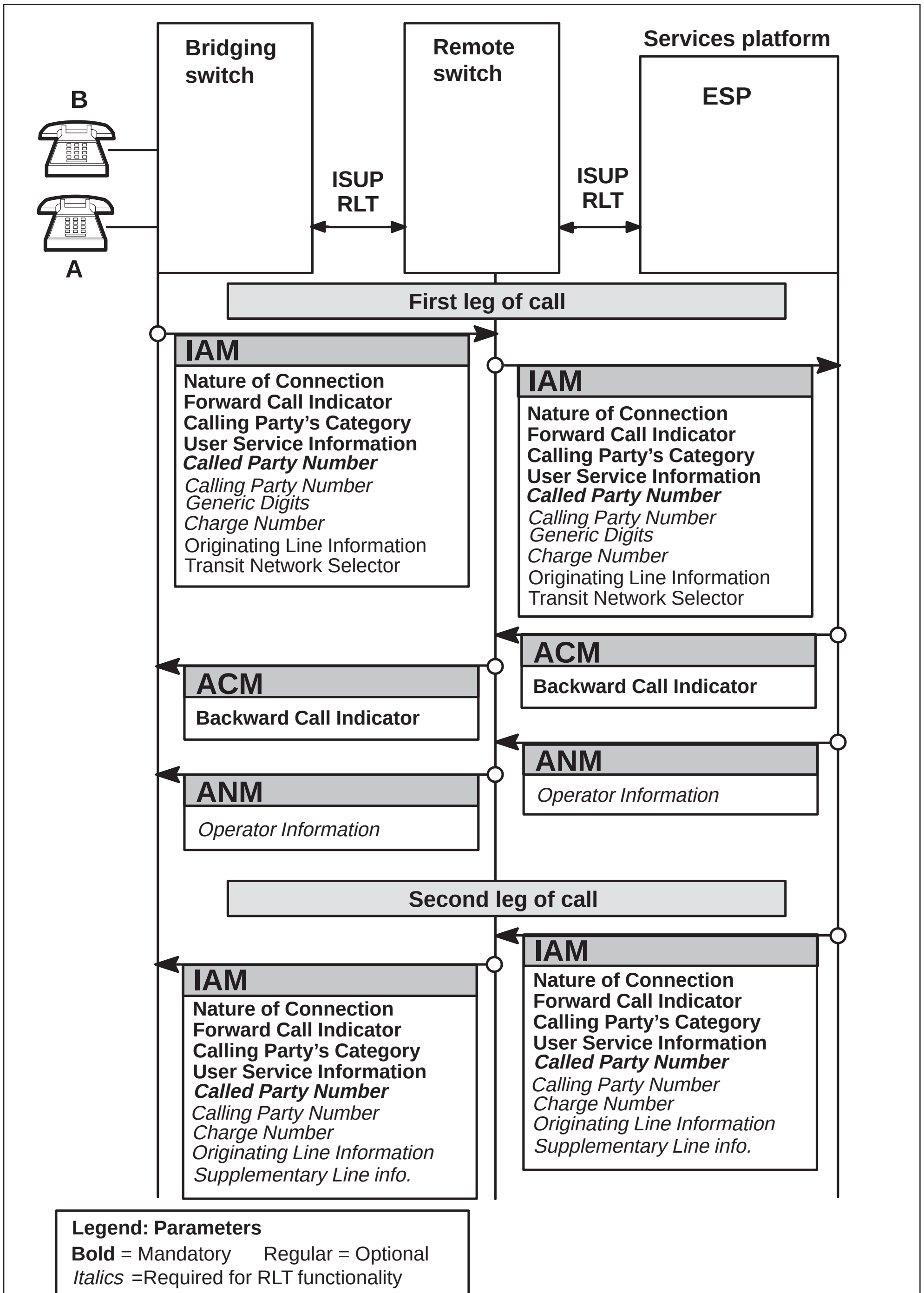


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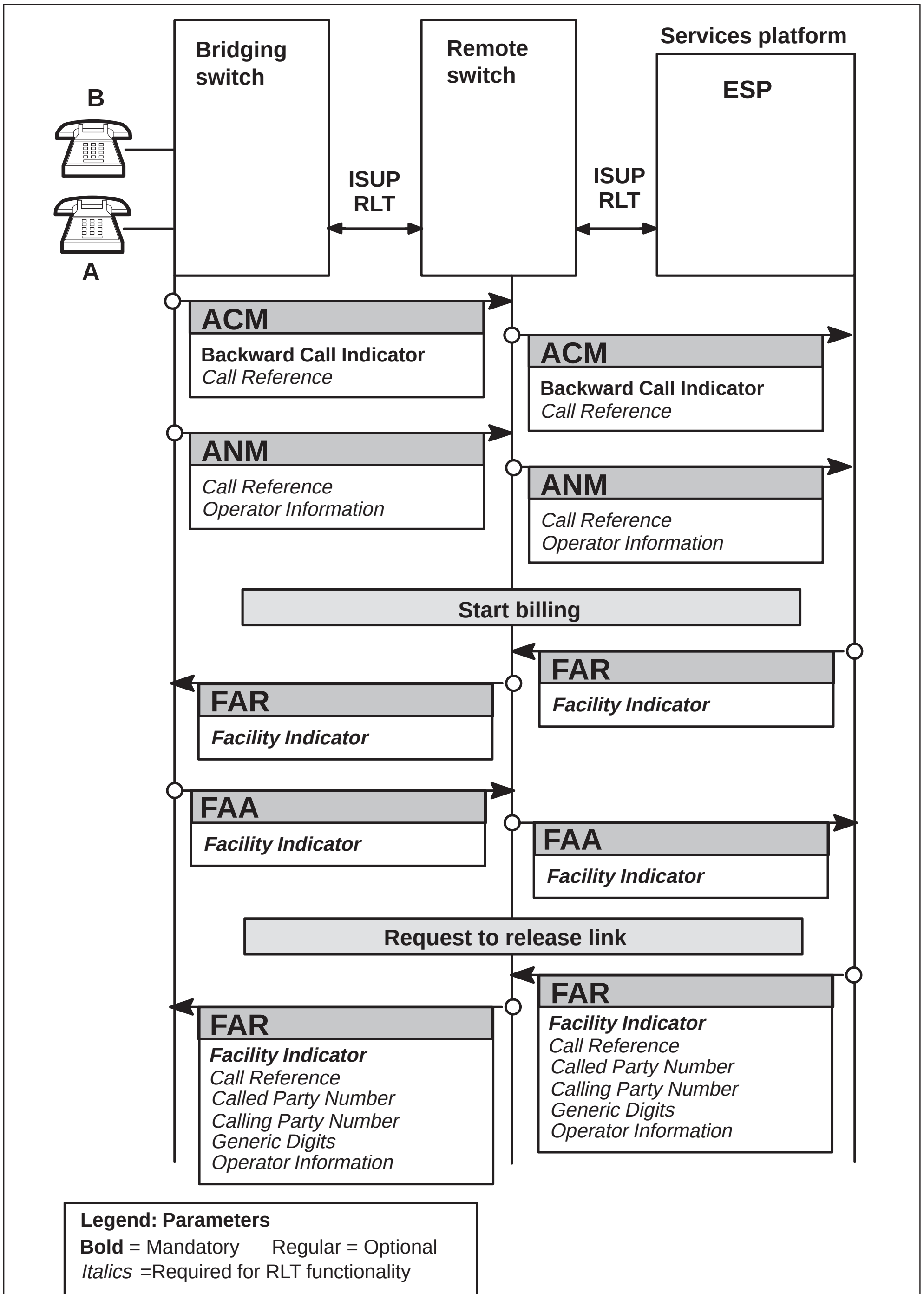
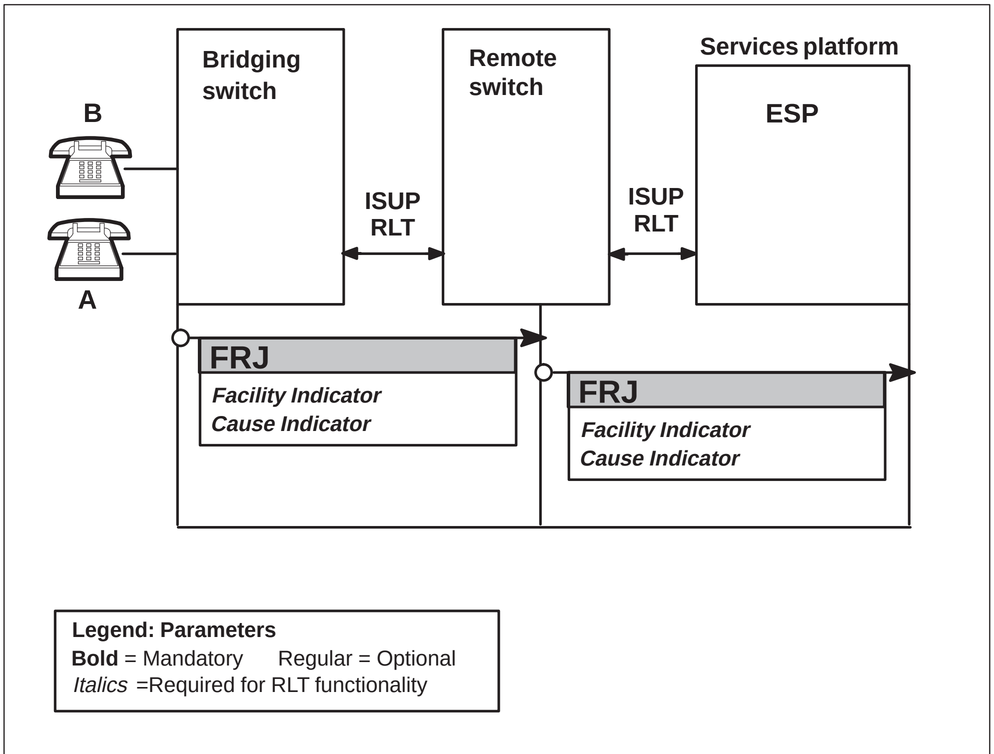
Figure 4-6
Message flow for third-party interaction error scenario (continued)



—continued—

Figure 4-6
Message flow for third-party interaction error scenario (continued)



—end—

Services platform-initiated callback scenario

In this scenario, the services platform disconnects a call for any of several reasons, such as when the terminator is not available until later, without connecting it to the terminator. Later, the services platform initiates a call to the first call's terminator, then initiates a second call to the first call's originator, and requests release link trunking. After the appropriate switch bridges the call, the release link trunking capability frees the services platform and the remote switch.

The trunks connecting the bridging switch, the remote switch, and the services platform are all ISUP IMTs with RLT functionality. The trunk connecting the caller to the bridging switch is one of the following:

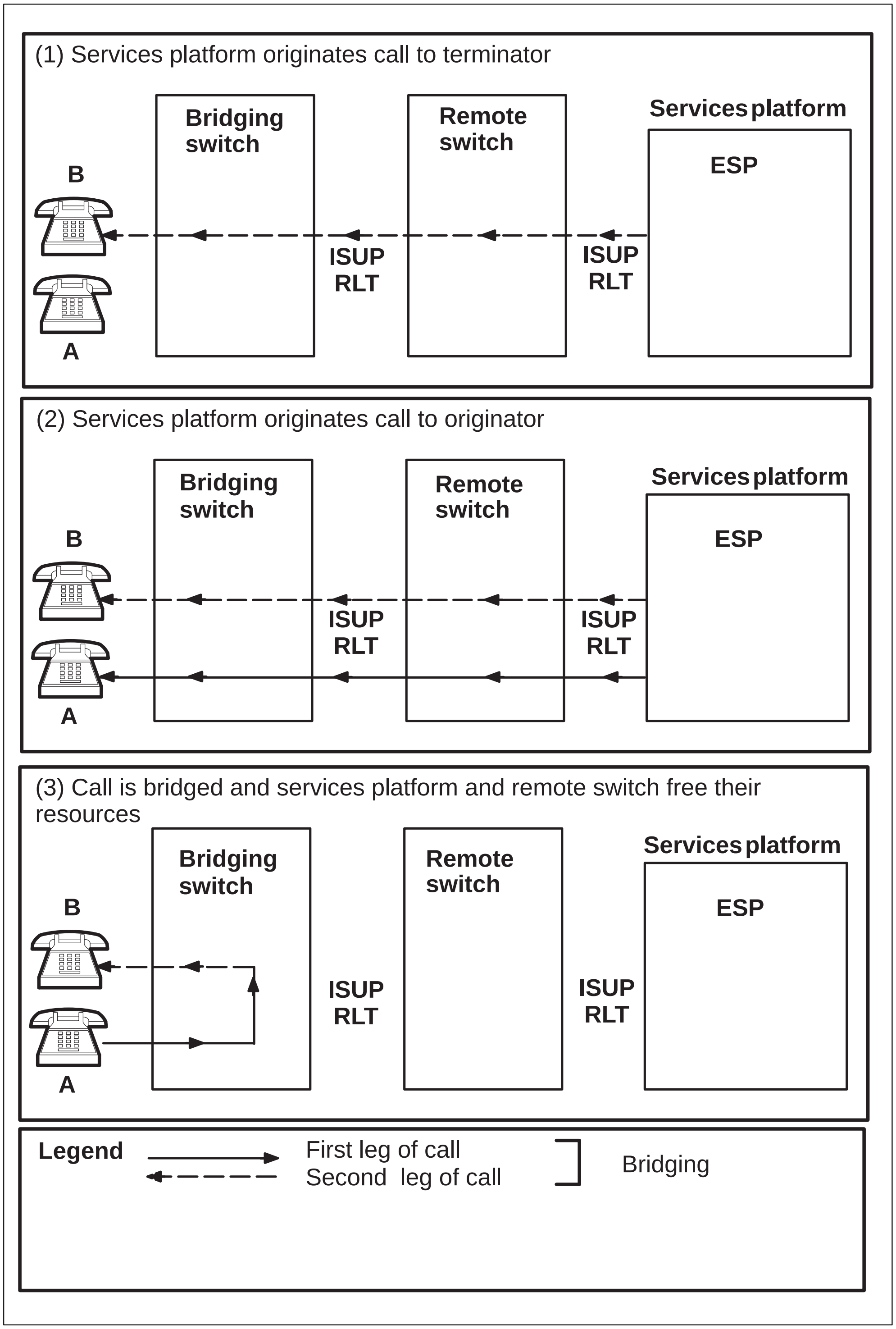
- a PTS trunk
- a PRI trunk
- an ISUP FGD trunk
- an ISUP IMT without RLT functionality

By definition, a switch only bridges a call when it cannot remove itself from the connection by passing the bridge request to another switch.

Note: PRI trunks and ISUP IMTs do not support call reorigination.

Figure 4-7 is a high-level diagram of the services platform-initiated callback scenario.

Figure 4-7
Services platform-initiated callback scenario



Message flow for ESP-initiated callback scenario

Figure 4-8 is a comprehensive message flow diagram for the services platform-initiated callback scenario. It shows the sequence for the exchange of messages and parameters between the bridging switch, the remote switch, and the services platform.

Specifically, the message exchange occurs as follows:

1 A switch, the bridging switch in this scenario, receives the call. Based on the nature of the call, the bridging switch formats an IAM and sends it to another switch, the remote switch in this scenario.

   Note: If the call is an N00 services call, the switch performs N00 lookup (that is, it translates the N00 services call into a ten-digit number). The switch places the N00 number in the CDR's Dialed Number field and places the ten-digit number in the CDR's Called Number field.

2 In response to the IAM from the bridging switch, the remote switch sends another IAM to the services platform. Table 4-15 shows parameters in this IAM that affect RLT functionality.

Table 4-15
Important RLT parameters in this IAM

RLT parameter	Comments
Called Party Number	The switches use the number of the party called when generating billing records. The switches place this value in the Called Number field of the CDR for the call. This parameter also provides an NOA value that indicates whether the call is operator-assisted or whether the switch must treat the call.
Calling Party Number	This parameter contains an ANI value. The switches add this value to the ANI SPILL field in the call's CDR, unless they pull the ANI value from the Charge Number parameter.

—continued—

Table 4-15
Important RLT parameters in this IAM (continued)

RLT parameter	Comments
Charge Number	This parameter contains an ANI value. If the IAM contains this parameter, the switches add this value to the ANI SPILL field in the call's CDR. If the IAM does not contain this parameter, the switches get the ANI value from the Calling Party Number parameter.
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (refer to Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).
—end—	

3 The services platform returns an ACM to the remote switch. The ACM confirms that the services platform received the information needed to route the call to its destination. The remote switch passes the ACM to the bridging switch.

4 When the services platform answers the call, the platform sends an ANM to the remote switch. The remote switch formats and sends another ANM to the bridging switch. Table 4-16 shows parameters in this ANM that affect RLT functionality.

Table 4-16
Important RLT parameters in this ANM

RLT parameter	Comments
Operator Information	This parameter provides operator information to the bridging switch which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields of the OSR for the call. This parameter's Reorigination Type field determines what type of reorigination, if any, switches can perform for the call.

Note 1: The ANM includes a Call Reference or Operator Information parameter only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

Note 2: Only ESPs with proper programming return this parameter in ANMs.

5 The services platform identifies the called party from the IAM, but does not make the call to that party. The services platform informs the calling party that they will be called back later when the services platform can complete a call to the call's terminator. The services platform then disconnects the call.

6 Later, the services platform initiates a call to the original call's called party, formatting a new IAM and sending it to the remote switch. Because the trunk connecting the remote switch and the services platform supports RLT functionality, and is a call-back call, the IAM includes the SLI parameter. Table 4-17 shows parameters in this IAM that affect RLT functionality.

Table 4-17
Important RLT parameters in this second leg IAM

RLT parameter	Comments
Called Party Number	The switches use the number of the party called when generating billing records. The switches place this value in the Called Number field of the CDR for the call. This parameter also provides an NOA value that indicates whether the call is operator-assisted or whether the switch must treat the call.
Calling Party Number	This parameter contains an ANI value. The switches add this value to the ANI SPILL field in the call's CDR, unleashed ANI value from the Charge Number parameter is used.
Charge Number	This parameter contains an ANI value. If the IAM contains this parameter, the switches add this value to the ANI SPILL field in the call's CDR. If the IAM does not contain this parameter, the switches get the ANI value from the Calling Party Number parameter.
Supplementary Line Information (SLI)	This parameter causes a receiving switch to include a Call Reference parameter in an ACM when it responds. In this scenario, this parameter has an RLT Call-back call value.

7 When it receives the IAM, the remote switch formats another IAM and sends it to the bridging switch. Because the trunk connecting the remote switch and the bridging switch supports RLT functionality, this IAM also includes the SLI parameter.

8 In response to the IAM with the SLI parameter, the bridging switch returns an ACM with a Call Reference parameter that identifies the original call. This ACM indicates that the terminating switch received the information that it needs to route the call.

9 The remote switch copies and saves the Call Reference parameter from the ACM. Then it changes the Call Reference in the ACM to contain the Call Reference information for the first leg of the callback. The switch routes this ACM to the services platform, which also saves the Call Reference parameter. Table 4-18 shows parameters in this ACM that affect RLT functionality.

Table 4-18
Important RLT parameters in this second leg ACM

RLT parameter	Comments
Call Reference	This parameter holds the switch's call identification and point code values for a call. ***Note:*** As each intermediate tandem switch passes this ACM, it replaces its own call identification and point code values with the values in this parameter.

10 When the terminating party of the first leg answers, the bridging switch formats an ANM and sends it to the remote switch. The remote switch passes the ANM to the services platform.

11 The services platform initiates the call's first leg by making a call to the initial call's originator. The services platform formats a new IAM and sends it to the remote switch. Because the trunk connecting the remote switch and the services platform supports RLT functionality, and this is a call-back call, the IAM includes the SLI parameter with an RLT callback indicator. Table 4-19 shows parameters in this IAM that affect RLT functionality.

Table 4-19
Important RLT parameters in this first leg IAM

RLT parameter	Comments
Calling Party Number	This parameter contains an ANI value. The switches add this value to the ANI SPILL field in the call's CDR, unless they pull the ANI value from the Charge Number parameter.
Called Party Number	The switches use the number of the party called when generating billing records. The switches place this value in the Called Number field of the CDR for the call. This parameter also provides an NOA value that indicates whether the call is operator-assisted or whether the switch must treat the call.
Charge Number	This parameter contains an ANI value. If the IAM contains this parameter, the switches add this value to the ANI SPILL field in the call's CDR. If the IAM does not contain this parameter, the switches get the ANI value from the Calling Party Number parameter.
Supplementary Line Information	This parameter identifies the call as being initiated by the services platform. In this scenario, this parameter has an RLT Call Back Call value.

12 When it receives the IAM, the remote switch formats another IAM and sends it to the bridging switch. Because the trunk connecting the remote switch and the bridging switch supports RLT functionality, and it is a call-back call, this IAM also includes the SLI parameter.

13 In response to the IAM with the SLI parameter, the bridging switch returns an ACM that the terminating switch received the information that it needs to route the call. The remote switch passes the ACM to the services platform.

14 When the terminating party of the first leg answers, the bridging switch formats an ANM and sends it to the remote switch. The remote switch passes the ANM to the services platform, connecting it in a three-way call with the calling party and called party.

15 The services platform initiates billing by sending a FAR message to the remote switch. Table 4-20 shows parameters in this FAR message that affect RLT functionality.

Table 4-20
Important RLT parameters in this Billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Start Billing Time value that the bridging switch uses.

16 The remote switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch.

17 The bridging switch also checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message’s Facility Indicator parameter. In this scenario, the indicator starts billing.

Note 1: In this example, the services platform, remote, and bridging switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch to which it originally terminated the call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a UCS DMS-250 switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message’s Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the bridging switch and the remote switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

18 To acknowledge that it received and processed the FAR message, the bridging switch formats an FAA message and sends it to the remote switch, which passes it to the services platform. Table 4-21 shows parameters in this FAA message that affect RLT functionality.

Table 4-21
Important RLT parameters in this Billing FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the same Start Billing Time value that was in the FAR message.

19 The ESP initiates release link trunking, sending another FAR message to the remote switch. Table 4-22 shows parameters in this FAR message that affect RLT functionality.

Note: A services platform or switch always sends a FAR message to the trunk circuit of the leg for which it does not have call reference information. In this scenario, the services platform sends the FAR message to the trunk of the call's first leg.

Table 4-22
Important RLT parameters in this FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for 3rd Party Interaction Call value that the bridging switch uses.
Call Reference	This parameter holds the switch's call identification and point code values for a call. The bridging switch uses this information to bridge the correct two calls. ***Note:*** As each intermediate tandem switch passes this FAR message, it replaces this parameter's call identification and point code values with values received in an ANM or ACM.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the OSR.

—continued—

Table 4-22
Important RLT parameters in this FAR message (continued)

RLT parameter	Comments
Calling Party Number	The switches, except billing switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the call's OSR.
Generic Digits	This parameter contains the CALLID value that the services platform provided. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match OSRs on both the services platform and bridging switches.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.
—end—	

20 Using the information in the FAR message, the remote switch identifies the associated call (the second call leg). By examining the point codes for the trunks of each leg of the call, it also determines whether both legs connect to the bridging switch.

21 Because the point codes are the same, the remote switch retrieves the Call Reference information that it copied when it received the ACM from the bridging switch (see step 8). The remote switch adds this reference information to a FAR message and sends the message to the bridging switch.

22 The bridging switch reads the message's Facility Indicator parameter and bridges the terminating trunk of the first call leg to the terminating trunk of the second call leg. The bridging switch uses the information in the FAR message's Call Reference parameter to identify the second leg.

23 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the remote switch, which passes it to the services platform. Table 4-23 shows parameters in this FAA message that affect RLT functionality.

Table 4-23
Important RLT parameters in this FAA message

RLT parameter	Comments
Facility indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the Release Link for 3rd Party Interaction Call value that was in the FAR message.

24 After bridging the call, the bridging switch formats two REL messages and sends them to the remote switch to release the call connections for both call legs. The REL messages include proper Cause Indicator parameters.

25 The remote switch sends two REL messages to the services platform and releases the call connections to the services platform and the corresponding trunks. It also sends two RLC messages back to the bridging switch to confirm the release of the first and second call legs. The RLC's also include proper Cause Indicator parameters.

Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

26 The services platform also releases its connections and returns two RLC's with proper Cause Indicator parameters to the remote switch to confirm the release of both call legs.

Figure 4-8 is a comprehensive message flow diagram for the services platform-initiated callback scenario.

Figure 4-8
Message flow for services platform-initiated callback scenario

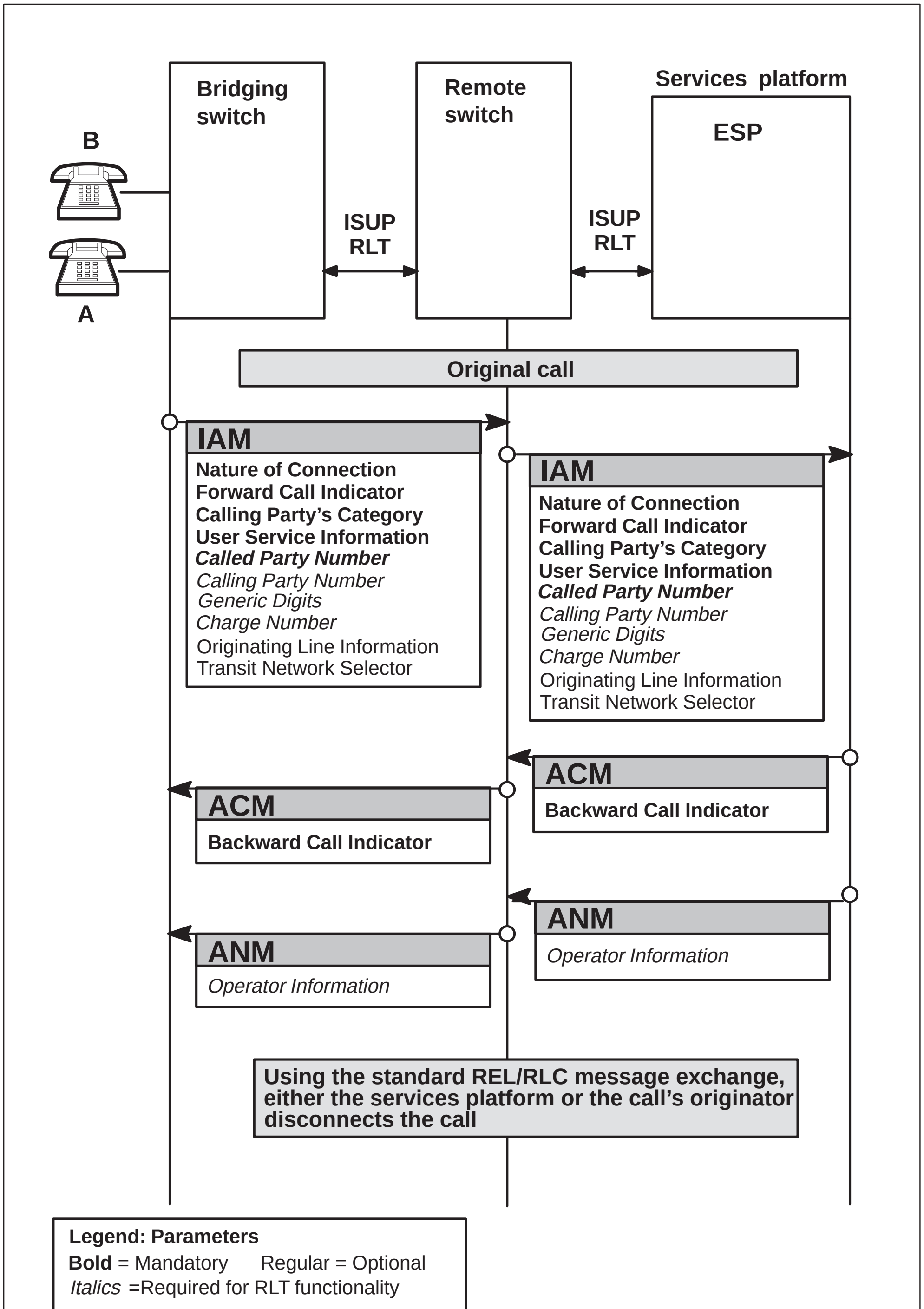


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Figure 4-8
Message flow for services platform-initiated callback scenario (continued)

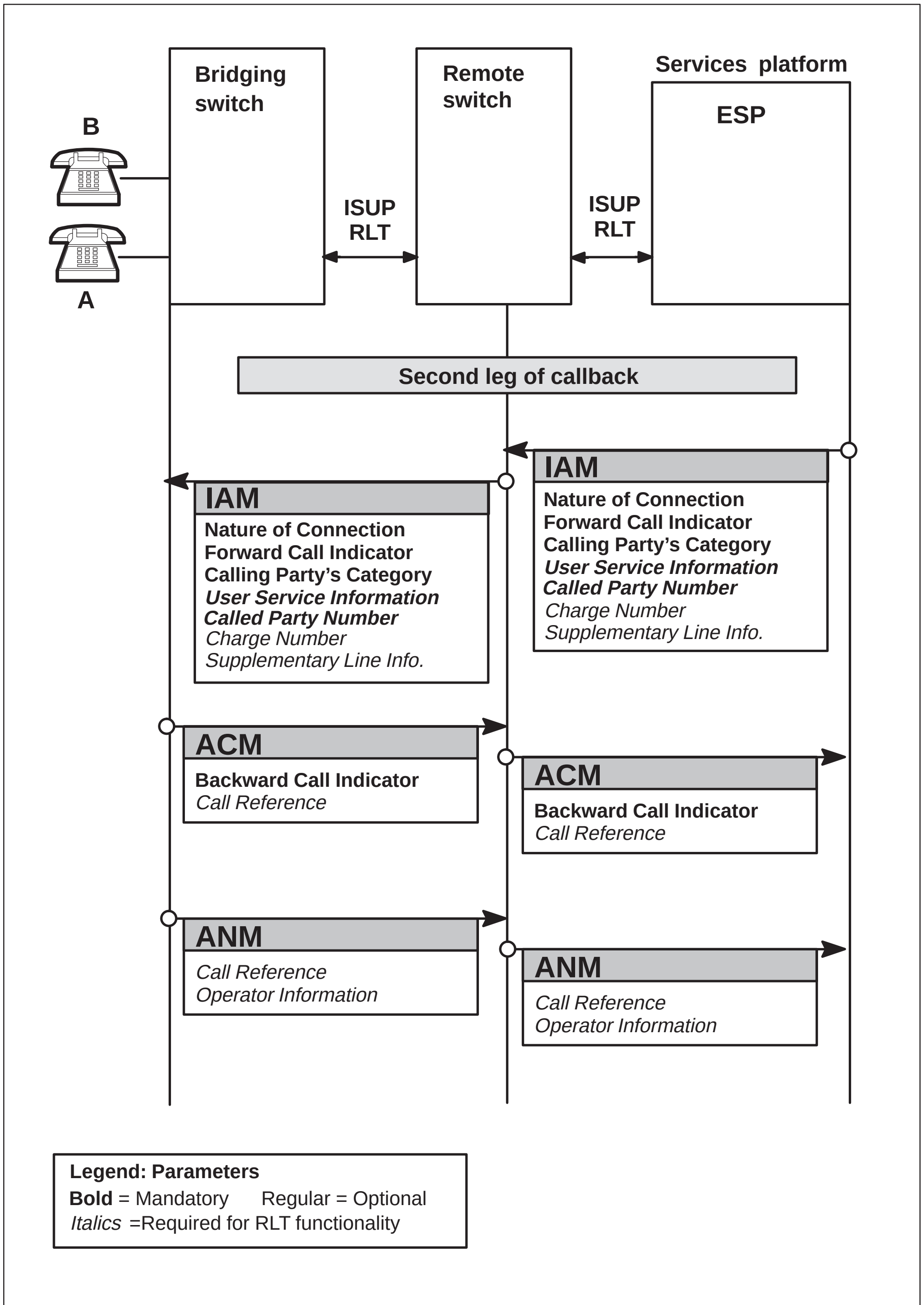

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Figure 4-8
Message flow for services platform-initiated callback scenario (continued)

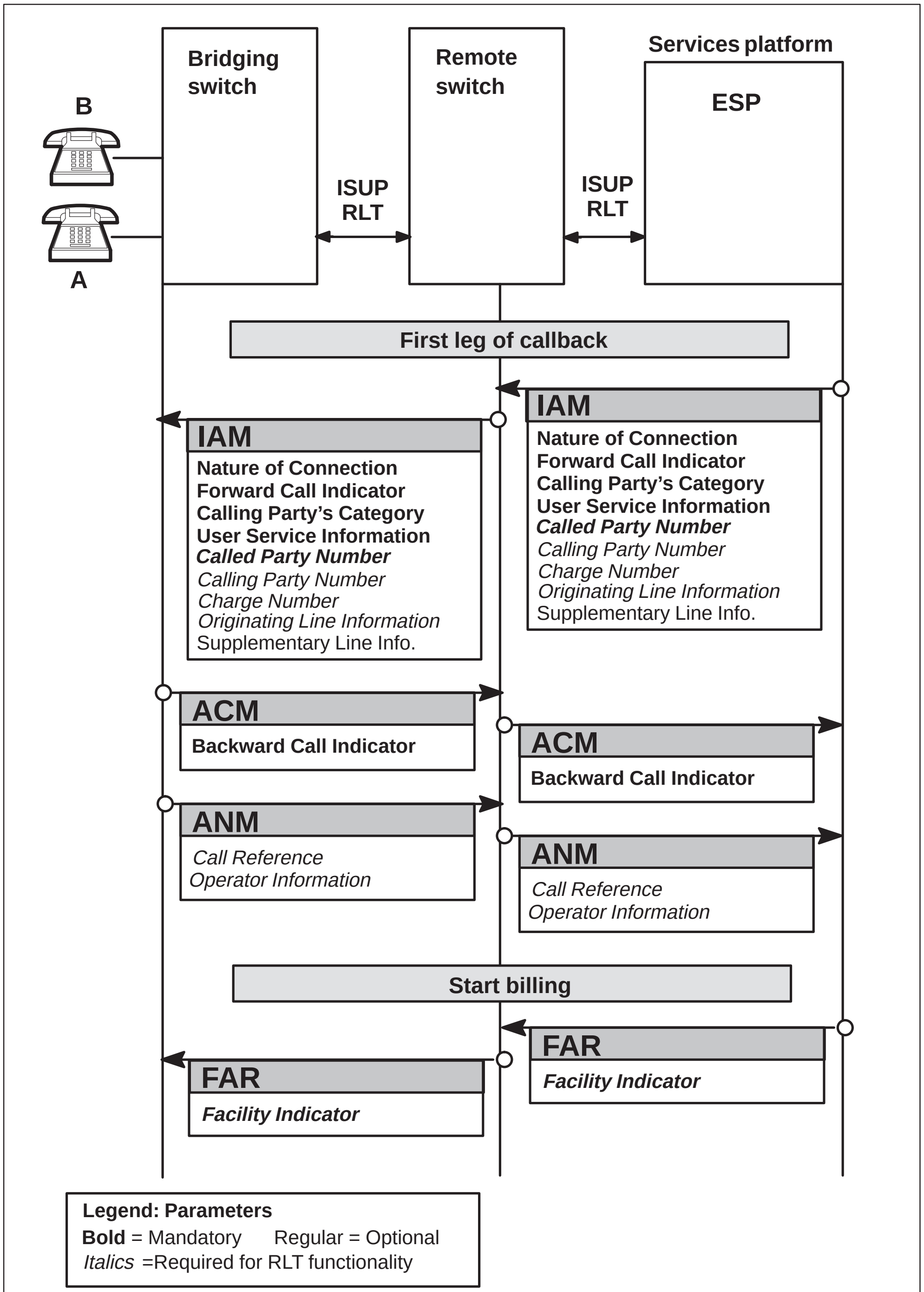

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Figure 4-8
Message flow for services platform-initiated callback scenario (continued)

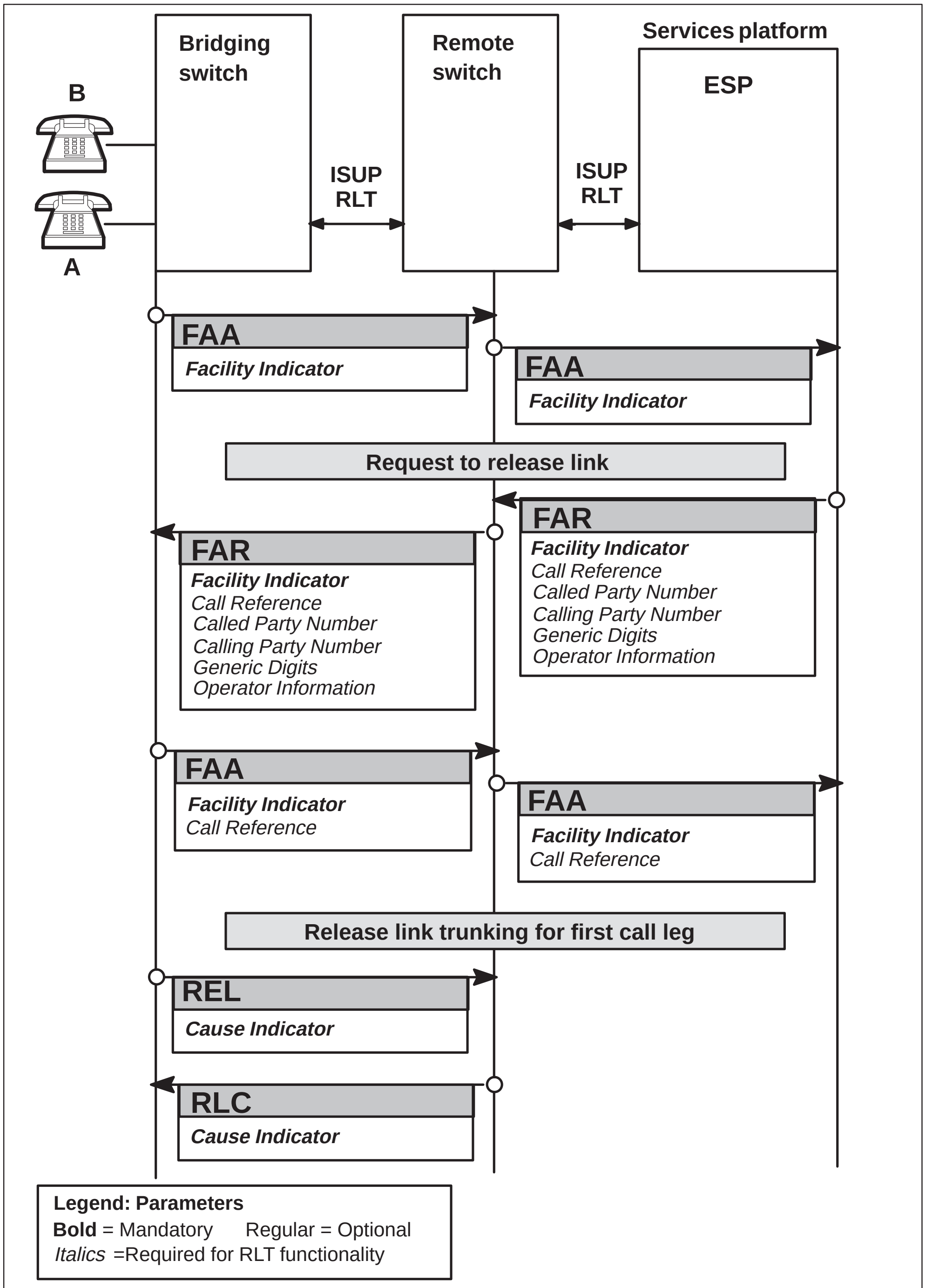

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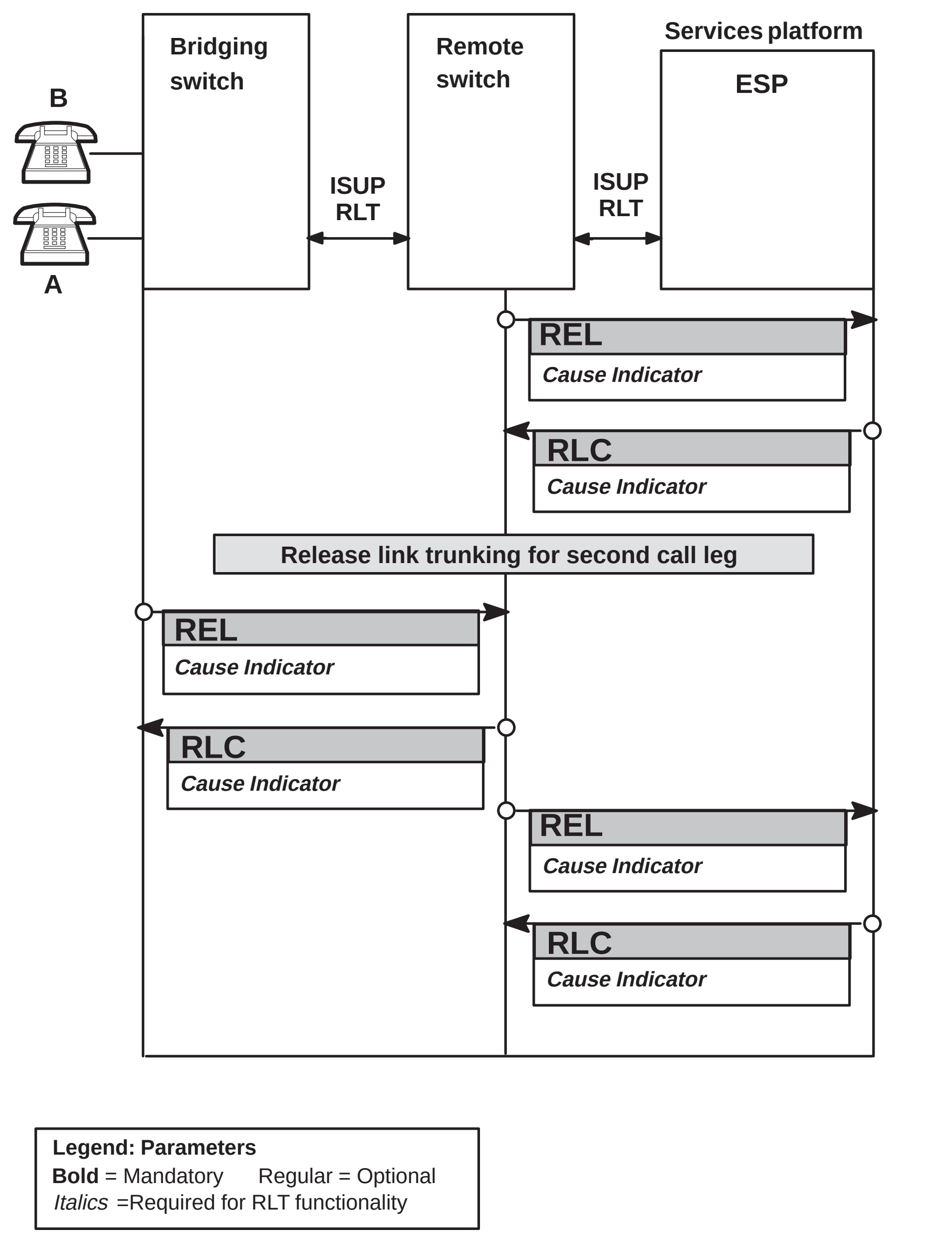
Figure 4-8
Message flow for services platform-initiated callback scenario (continued)



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Reorigination scenario with bridging at originating switch

In this scenario, the services platform transfers the call to its destination and requests release link trunking. After the appropriate switch bridges the call, the release link trunking capability frees the services platform and the remote switch.

The trunks connecting the bridging switch, the remote switch, and each services platform is an ISUP intermachine trunk (IMT) with RLT functionality. The trunk connecting the caller to the bridging switch is one of the following:

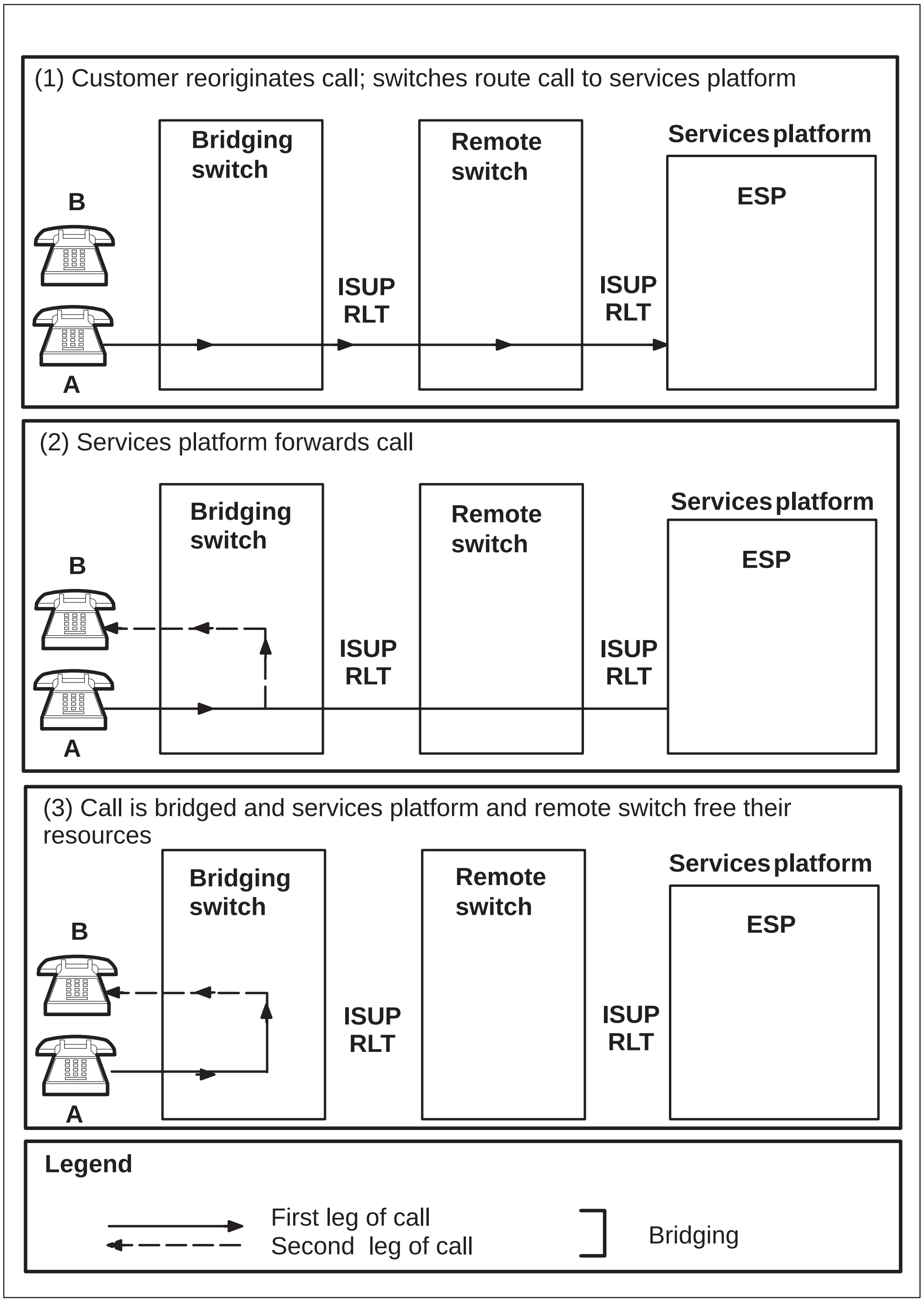
- a per-trunk signaling (PTS) trunk
- an ISUP FGD trunk

By definition, a switch only bridges a call when it cannot remove itself from the connection by passing the bridge request to another switch.

Note: PRI trunks and ISUP IMTs do not support call reorigination.

Figure 4-9 is a high-level diagram of the reorigination scenario with bridging at an originating switch.

Figure 4-9
Reorigination scenario with bridging at originating switch



Message flow for reorigination scenario

Figure 4-10 is a comprehensive message flow diagram for the reorigination scenario. It shows the sequence for the exchange of messages and parameters between the bridging switch, the remote switch, and the services platform.

Specifically, the message exchange occurs as follows:

1 A switch, the bridging switch in this scenario, receives the call. Based on the nature of the call, the bridging switch formats an Initial Address Message (IAM) and sends it to another switch, the remote switch in this scenario.

   Note: If the call is an N00 services (700, 800, or 900) call, the switch performs N00 lookup (that is, it translates the N00 services call into a ten-digit number). The switch places the N00 number in the CDR's Dialed Number field and places the ten-digit number into the CDR's Called Number field.

2 In response to the IAM from the bridging switch, the remote switch sends another IAM to the services platform. Table 4-24 shows parameters in this IAM that affect RLT functionality.

Table 4-24
Important RLT parameters in this IAM

RLT parameter	Comments
Called Party Number	The switches use the number of the party called when generating billing records. The switches place this value in the Called Number field of the CDR for the call. This parameter also provides a Nature of Address (NOA) value that indicates whether the call is operator-assisted or whether the switch must treat the call.
Charge Number	This parameter contains an automatic numbering identification (ANI) value. If the IAM contains this parameter, the switches add this value to the ANI SPILL field in the call's CDR. If the IAM does not contain this parameter, the switches get the ANI value from the Calling Party Number parameter.

—continued—

Table 4-24
Important RLT parameters in this IAM

RLT parameter	Comments
Calling Party Number	This parameter contains an ANI value. The switches add this value to the ANI SPILL field in the call's CDR, unless they pull the ANI value from the Charge Number parameter.
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (refer to Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).
—end—	

3 The services platform returns an Address Complete Message (ACM) to the remote switch. The ACM confirms that the services platform received the information needed to route the call to its destination. The remote switch passes the ACM to the bridging switch.

4 When the services platform answers the call, the platform sends an Answer Message (ANM) to the remote switch. The remote switch formats and sends another ANM to the bridging switch. Table 4-25 shows parameters in this ANM that affect RLT functionality.

Table 4-25
Important RLT parameters in this ANM

RLT parameter	Comments
Operator Information	This parameter's Reorigination Type field determines what type of reorigination, if any, switches can perform for the call.
Note 1: The ANM includes a Call Reference or Operator Information parameter only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).	
Note 2: Only ESPs with proper programming return this parameter in ANMs.	

5 The services platform identifies the called party, but does not make the call to that party. First, it initiates billing by sending a Facility Request (FAR) message to the remote switch. Table 4-26 shows parameters in this FAR message that affect RLT functionality.

Table 4-26
Important RLT parameters in this billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Start Billing Time value that the bridging switch uses.

6 The remote switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch.

7 The bridging switch also checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. In this scenario, the indicator starts billing.

Note 1: In this example, the services platform, remote, and bridging switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message's Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the bridging switch and the remote switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

8 To acknowledge that it received and processed the FAR message, the bridging switch formats a Facility Accept (FAA) message and sends it to the remote switch, which passes it to the services platform. Table 4-27 shows parameters in this FAA message that affect RLT functionality.

Table 4-27
Important RLT parameters in this Billing FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the same Start Billing Time value that was in the FAR message.

9 The services platform then sends a Facility Request (FAR) message to the remote switch. Table 4-28 shows parameters in this FAR message that affect RLT functionality.

Table 4-28
Important RLT parameters in this reorigination FAR message

RLT parameter	Comments
Operator Information	This parameter contains reorigination information in the Reorigination Type field.

10 The remote switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch.

11 The bridging switch also checks the FAR message. This switch reads and performs the action designated in the FAR message's Operator Information parameter. In this case, the switch deallocates all the reorigination resources (if any) and then allocates new resources as designated in the FAR.

Note: The services platform may send a reorigination FAR several times.

12 To acknowledge that it received and processed the FAR message, the bridging switch formats a Facility Accept (FAA) message and sends it to the remote switch, which passes it to the services platform.

13 The ESP initiates release link trunking, sending another FAR message to the remote switch. Table 4-29 shows parameters in this FAR message that affect RLT functionality.

Table 4-29
Important RLT parameters in this Redirect FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for Operator Redirect/Transfer value that the bridging switch uses.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call. This parameter also contains the Reorigination Type field, and may contain the following other reorigination fields: Bridge Reorigination Control, UTR Digit, Reorigination Trigger Type, Reorigination Allowed, STR Digit, STR Key Duration at Talking, STR Key Duration at Non-Talking, Immediate, and Disconnect Timer.
Calling Party Number	The switches, except bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform provided. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match OSRs on both the services platform and bridging switches.

14 The remote switch passes the FAR to the bridging switch. In this case, the deallocates all the reorigination resources (if any) and then allocates new resources as designated in the Operator Information parameter of the FAR.

15 Because the trunk connecting the bridging switch to the switch from which it originally received the call does not support RLT functionality, the bridging switch reads the message's Facility Indicator and performs release link trunking. Using translations of the Called Party Number parameter, the bridging switch completes the second leg of the call.

Note: If the Called Party Number parameter contains an N00 services number, the switch supports boomerang reorigination. Refer to Chapter 5, "RLT call scenarios for ESP," for a description of boomerang reorigination.

16 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the remote switch, which passes it to the services platform. Table 4-30 shows parameters in this FAA message that affect RLT functionality.

Table 4-30
Important RLT parameters in this Redirect FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the "Release Link for Operator Redirect/Transfer" value that was in the FAR message.

17 The services platform then sends a Facility Request (FAR) message to the remote switch. Table 4-31 shows parameters in this FAR message that affect RLT functionality.

Table 4-31
Important RLT parameters in this reorigination FAR message

RLT parameter	Comments
Operator Information	This parameter contains reorigination information in the Reorigination Type field.

18 The remote switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch.

19 The bridging switch also checks the FAR message. This switch reads and performs the action designated in the FAR message's Operator Information parameter. In this case, the deallocates all the reorigination resources (if any) and then allocates new resources as designated in the FAR.

Note: The services platform may send a reorigination FAR several times.

20 To acknowledge that it received and processed the FAR message, the bridging switch formats a Facility Accept (FAA) message and sends it to the remote switch, which passes it to the services platform.

21 After bridging the call, the bridging switch formats a Release (REL) message and sends it to the remote switch. The REL message includes a Normal Clearing Cause Indicator parameter.

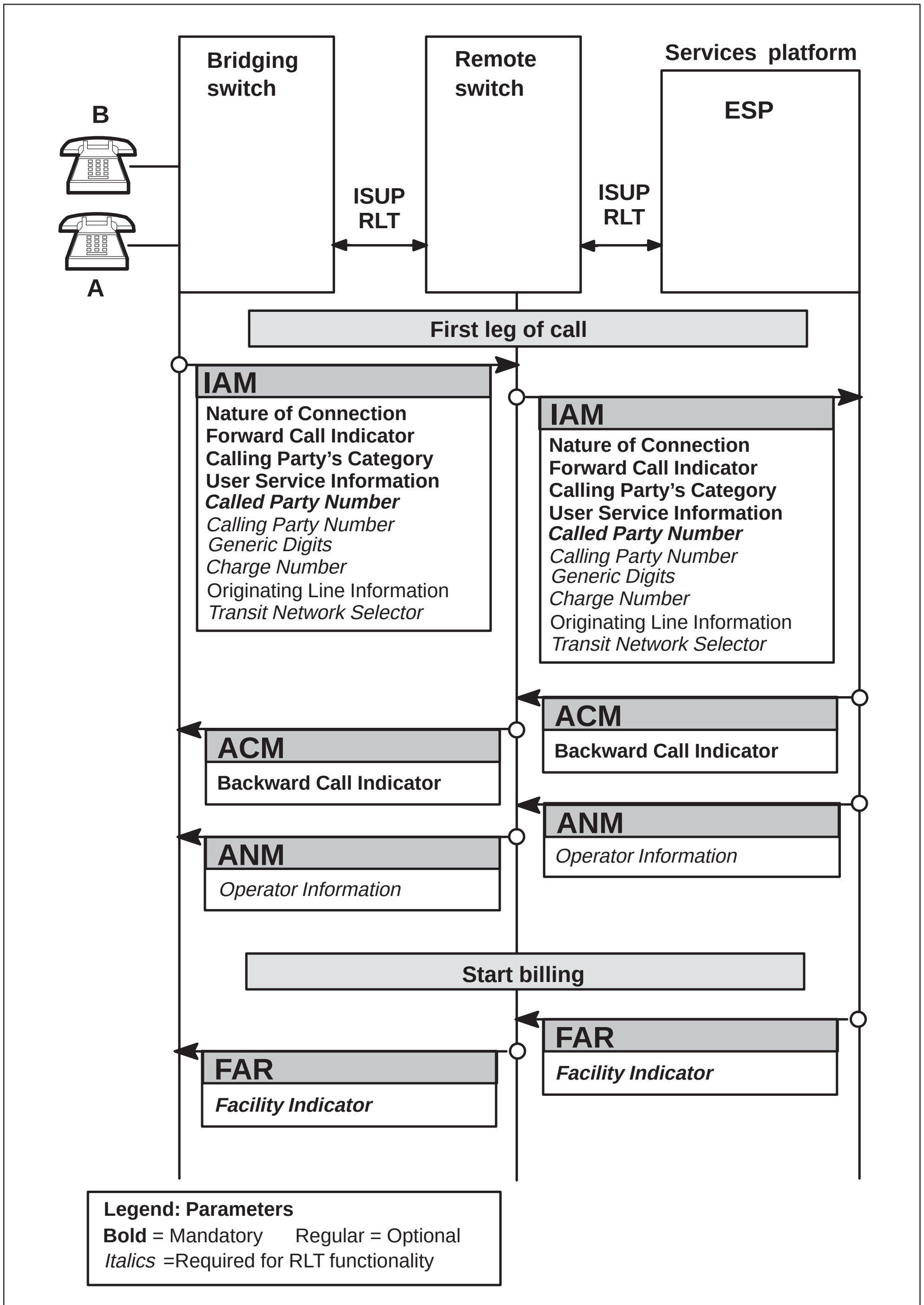
22 The remote switch sends another REL message to the services platform and releases the connection to the services platform and the corresponding trunks. It also sends a Release Complete (RLC) message back to the bridging switch to confirm the release. This RLC also includes a proper Cause Indicator parameter.

Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

23 The services platform also releases its connections and returns another RLC with a proper Cause Indicator to the remote switch to confirm the release.

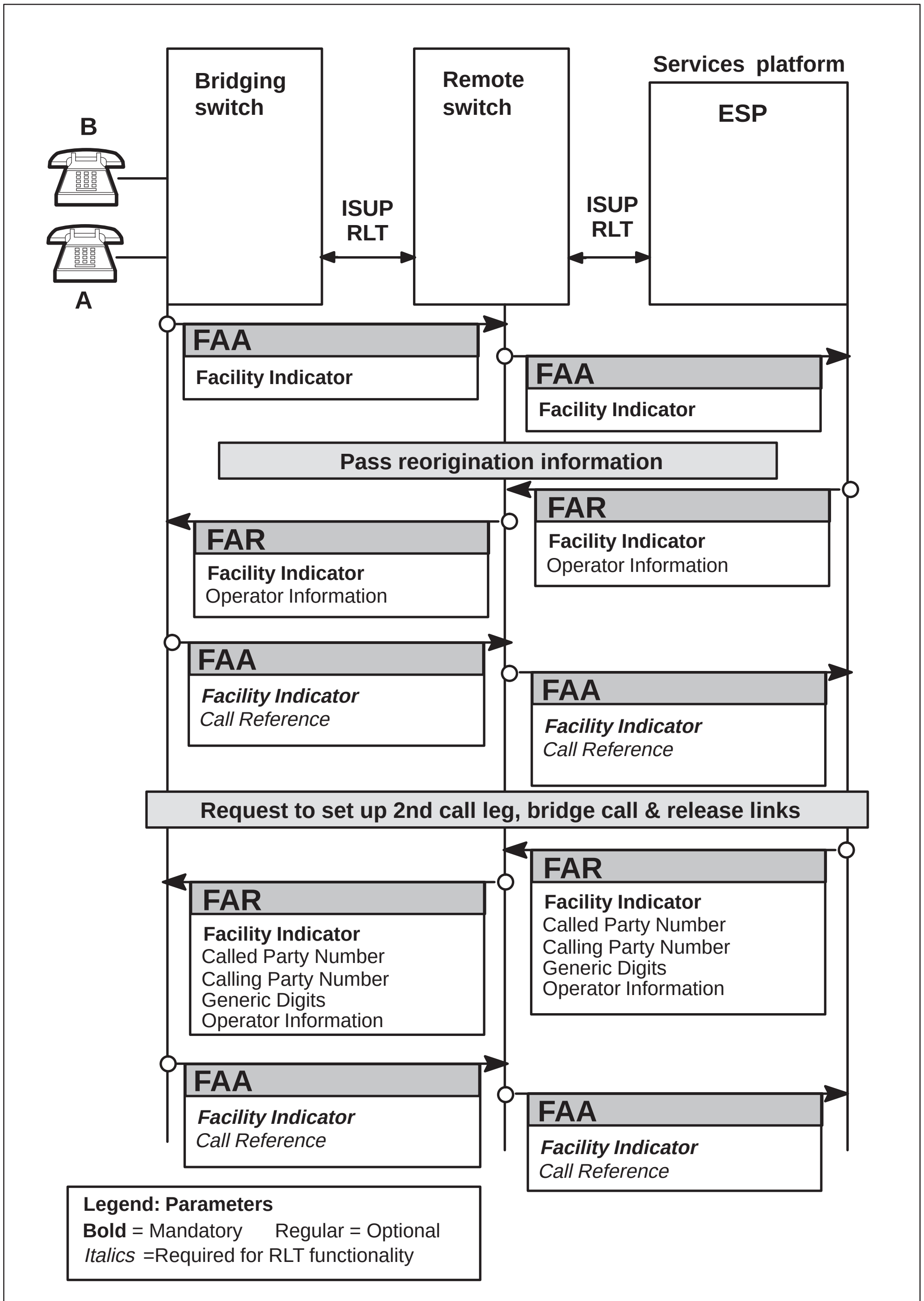
Figure 4-10 is a comprehensive message flow diagram for the reorigination scenario.

Figure 4-10
Message flow for reorigination scenario



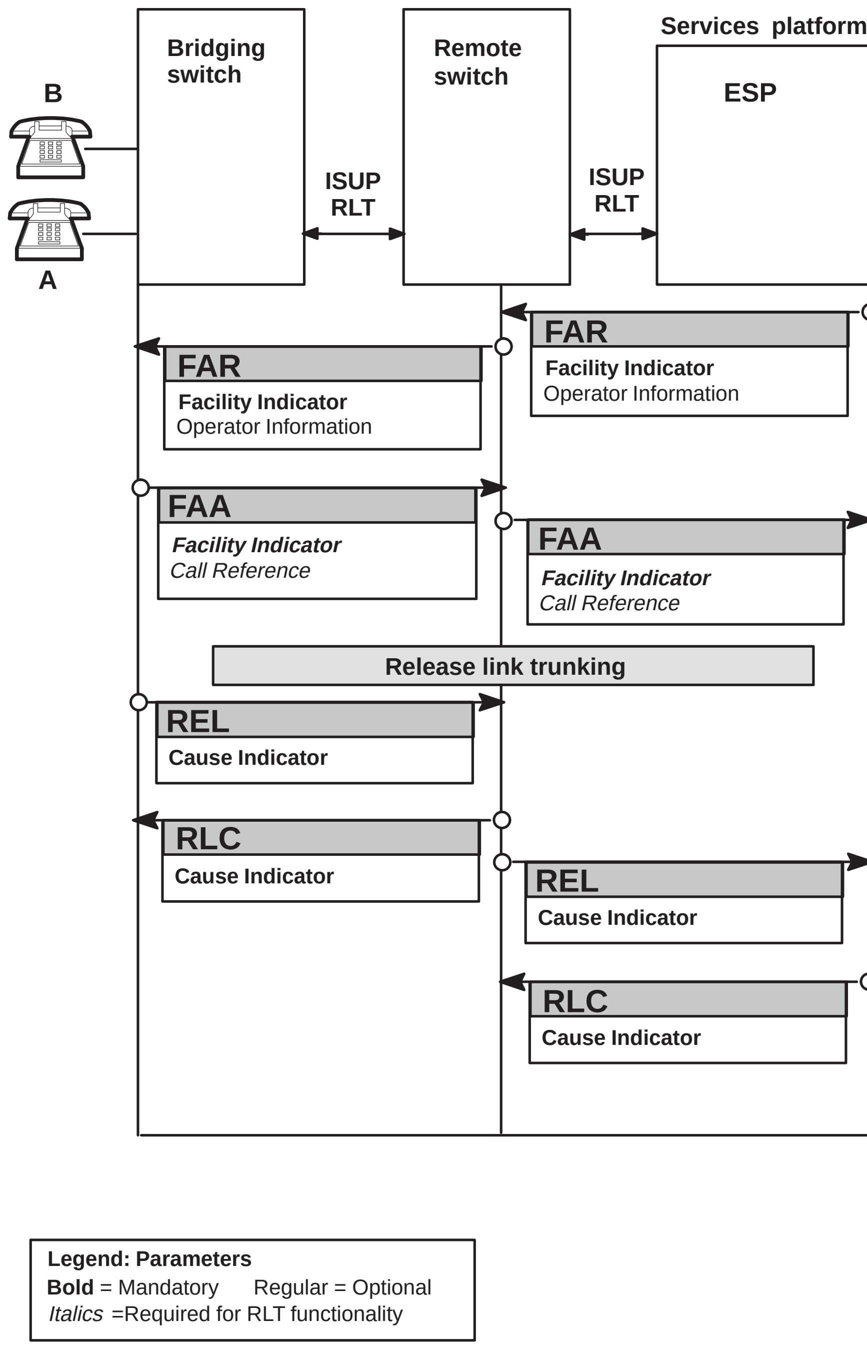
—continued—

Figure 4-10
Message flow for reorigination scenario (continued)



—continued—

Figure 4-10
Message flow for reorigination scenario (continued)



—end—

Reorigination error scenario with bridging at originating switch

This section explains the message flow for the reorigination scenario when, for whatever reason, a UCS DMS-250 switch cannot perform the action requested in the Facility Indicator parameter of a FAR message. In this case, the switch involved does not perform the action requested (such as release link trunking) and cannot complete the call. The switches must process the call using call treatment or other means. The error scenario is identical to the standard reorigination scenario up to step 13.

Message flow for reorigination error scenario

Figure 4-11 is a comprehensive message flow diagram for the reorigination error scenario. It shows the sequence for the exchange of messages and parameters between the bridging switch, the remote switch, and the services platform.

Specifically, the message exchange in this error scenario occurs as follows:

1. A switch, the bridging switch in this scenario, receives the call. The switches and services platform exchange messages just as in steps 1–13 in the standard reorigination scenario.
2. The ESP initiates release link trunking, sending another FAR message to the remote switch. Table 4-32 shows parameters in this FAR message that affect RLT functionality.

Table 4-32
Important RLT parameters in this Redirect FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for Operator Redirect/Transfer value that the bridging switch uses.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call. This parameter also contains the Reorigination Type field, and may contain the following other reorigination fields:
—continued—	

Table 4-32
Important RLT parameters in this Redirect FAR message (continued)

RLT parameter	Comments
Operator Information (continued)	Bridge Reorigination Control, UTR Digit, Reorigination Trigger Type, Reorigination Allowed, STR Digit, STR Key Duration at Talking, STR Key Duration at Non-talking, Immediate, and Disconnect Timer.
Calling Party Number	The switches, except bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform provided. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match OSRs on both the services platform and bridging switches.
—end—	

3 The remote switch passes the FAR to the bridging switch. In this case, the attempts to deallocate all the reorigination resources (if any) and then allocate new resources as designated in the Operator Information parameter of the FAR. In this scenario, this reallocation fails.

4 The bridging switch checks the Bridge Reorig. Control field in the Operator Information parameter of the FAR. If the field is N, the services attempts to redirect at the Bridging switch, regardless of the failure of resource allocation. If the field is Y, the services platform does not attempt to bridge. In this scenario, the Bridge Reorig. Control field is Y.

5 The bridging switch sends an FRJ message to the remote switch containing the Cause Value Bridging failed due to reorigination failure. in the Cause Indicator parameter. Table 4-33 shows parameters in this FRJ message that affect RLT functionality.

Table 4-33
Important RLT parameters in this FRJ message

RLT parameter	Comments
Cause Indicator	This parameter contains the value “Bridging failed due to reorigination failure” in the Cause Value field.

6 The remote switch passes the FRJ message back to the services platform.

7 The services platform then sends a Facility Request (FAR) message to the remote switch. Table 4-34 shows parameters in this FAR message that affect RLT functionality.

Table 4-34
Important RLT parameters in this reorigination FAR message

RLT parameter	Comments
Operator Information	This parameter contains reorigination information in the Reorigination Type field.

8 The remote switch checks the FAR message and passes it to the bridging switch.

9 The bridging switch also checks the FAR message. This switch reads and performs the action designated in the FAR message’s Operator Information parameter. In this case, the switch deallocates all the reorigination resources (if any) and then allocates new resources as designated in the FAR.

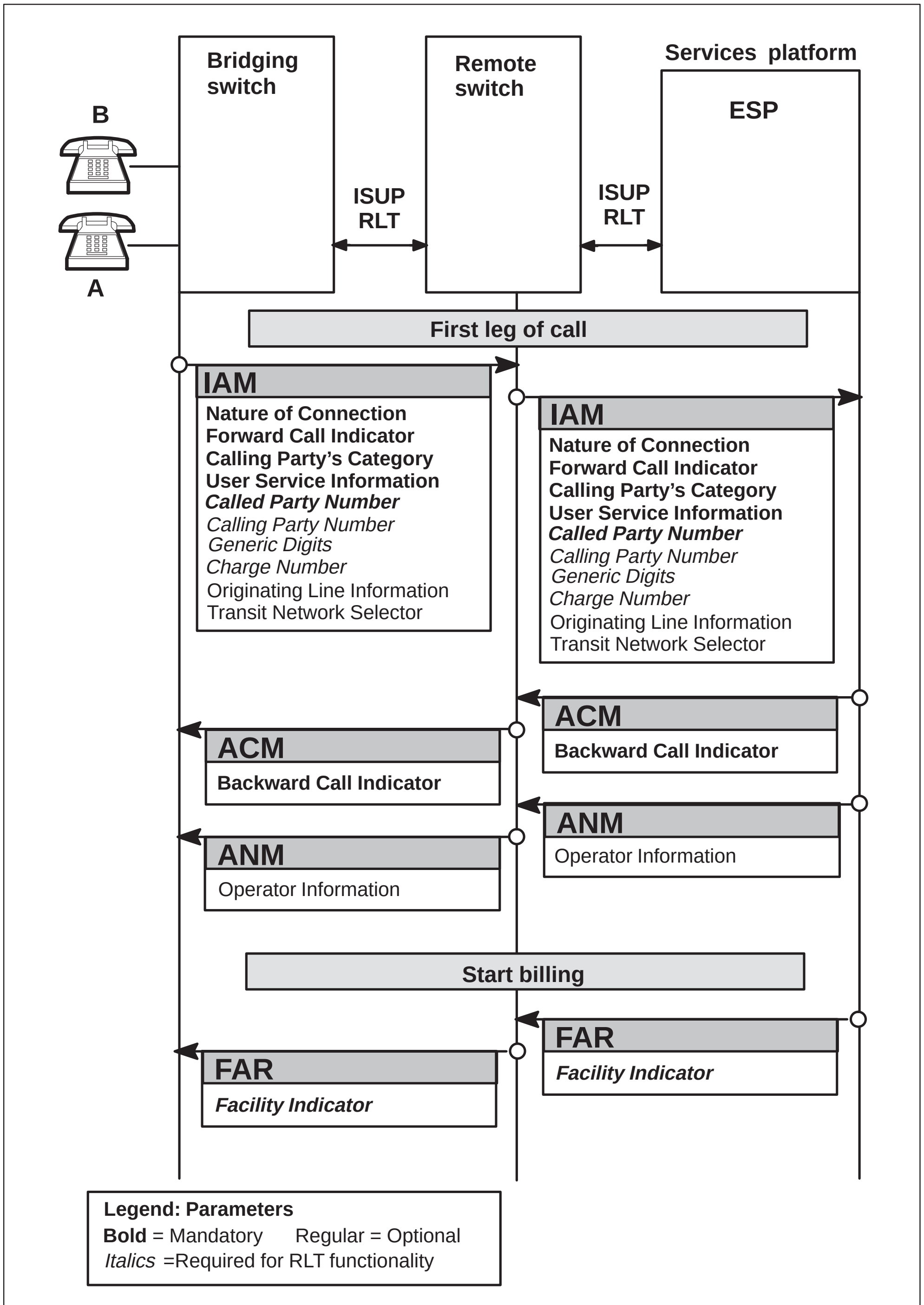
Note: The services platform may send a reorigination FAR several times.

10 To acknowledge that it received and processed the FAR message, the bridging switch formats a Facility Accept (FAA) message and sends it to the remote switch, which passes it to the services platform.

11 Until the call is completed, the services platform bridges the call and maintains connections on all of the trunks and switches that support both legs of the call.

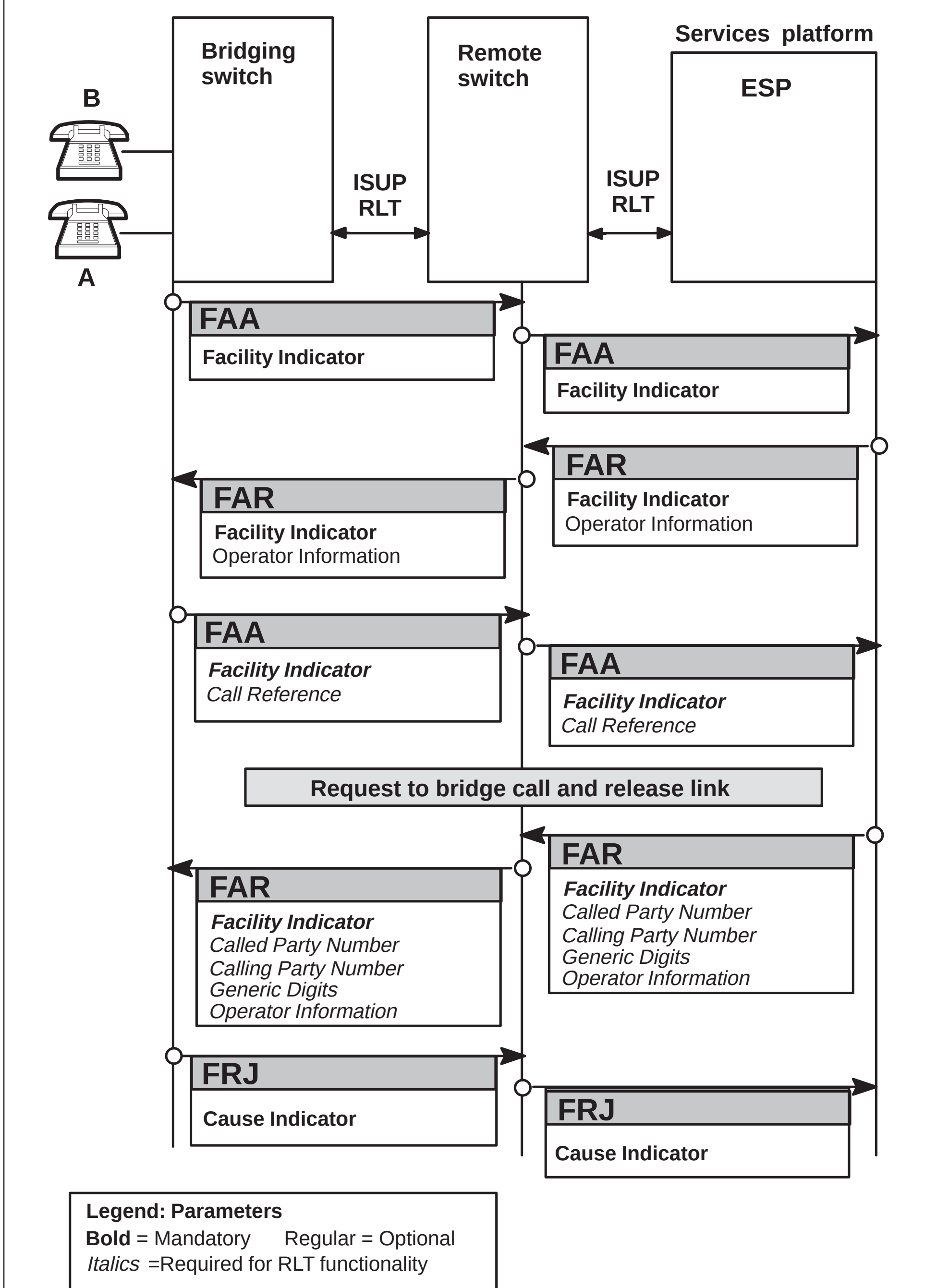
Figure 4-11 is a comprehensive message flow diagram for the reorigination error scenario.

Figure 4-11
Message flow for reorigination scenario



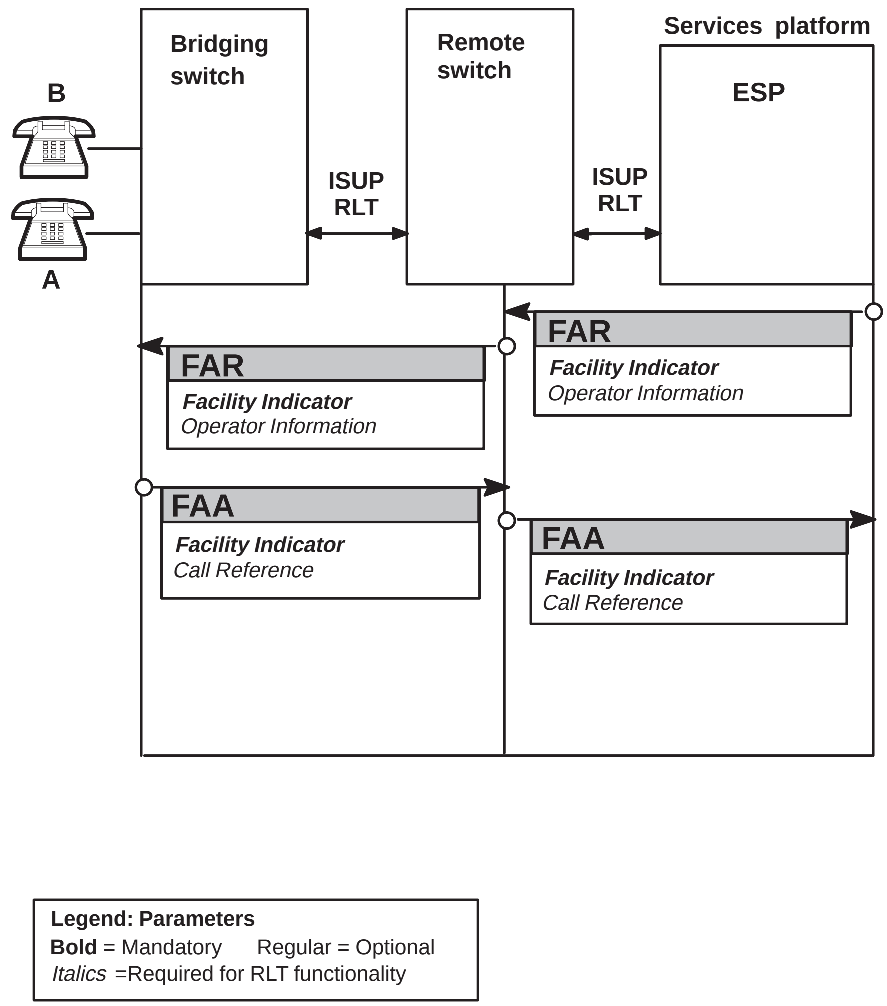
—continued—

Figure 4-11
Message flow for reorigination scenario (continued)



—continued—

Figure 4-11
Message flow for reorigination scenario (continued)



—end—

Reorigination scenario, bridging not at originating or services platform

In this scenario, the ESP transfers the call to its destination and requests release link trunking. After the appropriate switch bridges the call, the release link trunking capability frees the services platform and the remote switch.

The trunks connecting the bridging switch, the remote switch, and each services platform is an ISUP intermachine trunk (IMT) with RLT functionality. The trunk connecting the caller to the bridging switch is one of the following:

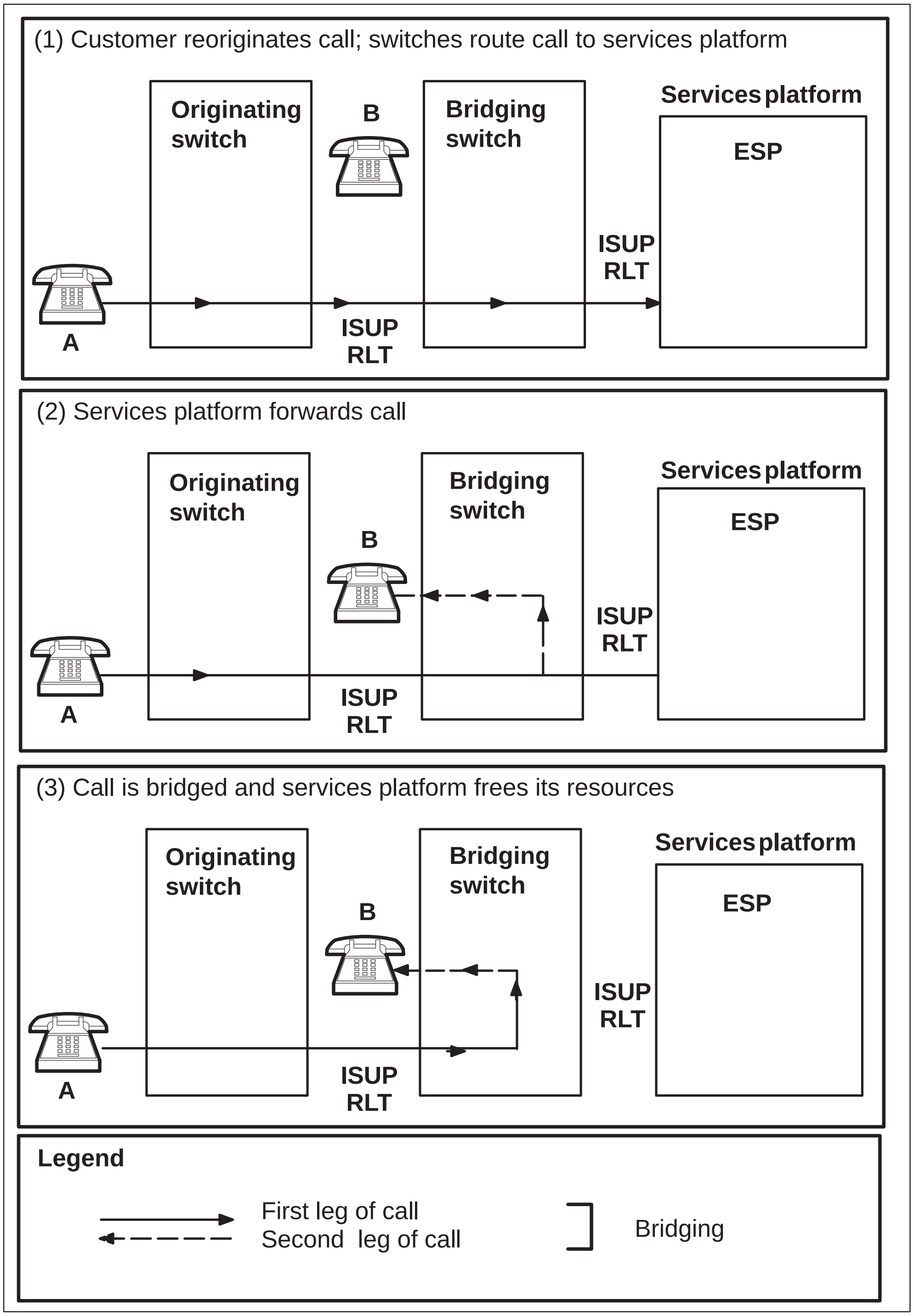
- per-trunk signaling (PTS) trunk
- ISUP FGD trunk

By definition, a switch only bridges a call when it cannot remove itself from the connection by passing the bridge request to another switch.

Note: PRI trunks and ISUP IMTs do not support call reorigination.

Figure 4-12 is a high-level diagram of the reorigination scenario.

Figure 4-12
Reorigination scenario



Message flow for reorigination scenario

Figure 4-13 is a comprehensive message flow diagram for the reorigination scenario where bridging occurs at a switch other than the originating or services platform. It shows the sequence for the exchange of messages and parameters between the bridging switch, the remote switch, and the services platform.

Specifically, the message exchange occurs as follows:

1 A switch, the originating switch in this scenario, receives the call. Based on the nature of the call, the originating switch formats an Initial Address Message (IAM) and sends it to another switch, the bridging switch in this scenario.

2 In response to the IAM from the originating switch, the bridging switch sends another IAM to the services platform. Table 4-35 shows parameters in this IAM that affect RLT functionality.

Table 4-35
RLT parameters in the IAM

Heading	Heading
Called Party Number	The switches use the number of the party called when generating billing records. The switches place this value in the Called Number field of the CDR for the call. This parameter also provides a Nature of Address (NOA) value that indicates whether the call is operator-assisted or whether the switch must treat the call.
Charge Number	This parameter contains an automatic numbering identification (ANI) value. If the IAM contains this parameter, the switches add this value to the ANI SPILL field in the call’s CDR. If the IAM does not contain this parameter, the switches get the ANI value from the Calling Party Number parameter.

—continued—

Table 4-35
RLT parameters in the IAM

Heading	Heading
Calling Party Number	This parameter contains an ANI value. The switches add this value to the ANI SPILL field in the call's CDR, unless they pull the ANI value from the Charge Number parameter.
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (refer to Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).
—end—	

3 The services platform returns an Address Complete Message (ACM) to the bridging switch. The ACM confirms that the services platform received the information needed to route the call to its destination. The bridging switch passes the ACM to the originating switch.

4 When the services platform answers the call, the platform sends an Answer Message (ANM) to the bridging switch. The bridging switch formats and sends another ANM to the originating switch. Table 4-36 shows parameters in this ANM that affect RLT functionality.

Table 4-36
Important RLT parameters in this ANM

RLT parameter	Comments
Operator Information	This parameter's Reorigination Type field determines what type of reorigination, if any, switches can perform for the call.

Note 1: The ANM includes a Call Reference or Operator Information parameter only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

Note 2: Only ESPs with proper programming return this parameter in ANMs.

5 The services platform identifies the called party, but does not make the call to that party. First, it initiates billing by sending a Facility Request (FAR) message to the bridging switch. Table 4-37 shows parameters in this FAR message that affect RLT functionality.

Table 4-37
Important RLT parameters in this billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Start Billing Time value that the bridging switch uses.

6 The bridging switch checks the FAR message and determines that the trunk connecting the originating switch and the bridging supports RLT functionality. The bridging switch passes this FAR to the Originating switch. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. In this scenario, the indicator starts billing.

Note 1: In this example, the services platform, bridging, and originating switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message's Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the originating switch and the bridging switch in this scenario did not support release link trunking, the bridging switch would not pass the FAR message, and would therefore be the bridging switch.

7 To acknowledge that it received and processed the FAR message, the originating switch formats a Facility Accept (FAA) message and sends it to the bridging switch, which passes it to the services platform. Table 4-38 shows parameters in this FAA message that affect RLT functionality.

Table 4-38
Important RLT parameters in this Billing FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the same Start Billing Time value that was in the FAR message.

8 The services platform then sends a Facility Request (FAR) message to the bridging switch. Table 4-39 shows parameters in this FAR message that affect RLT functionality.

Table 4-39
Important RLT parameters in this reorigination FAR message

RLT parameter	Comments
Operator Information	This parameter contains reorigination information in the Reorigination Type field.

9 The bridging switch checks the FAR message and determines that the trunk connecting the originating switch and the bridging switch supports RLT functionality. The bridging switch then passes the FAR message to the originating switch.

10 The originating switch also checks the FAR message. This switch reads and performs the action designated in the FAR message's Operator Information parameter. In this case, the UCS DMS–250 deallocates all the reorigination resources (if any) and then allocates new resources as designated in the FAR.

Note: The services platform may send a reorigination FAR several times.

11 To acknowledge that it received and processed the FAR message, the originating switch formats a Facility Accept (FAA) message and sends it to the bridging switch, which passes it to the services platform.

12 The ESP initiates release link trunking, sending another FAR message to the remote switch. Table 4-40 shows parameters in this FAR message that affect RLT functionality.

Table 4-40
Important RLT parameters in this Redirect FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for Operator Redirect/Transfer value that the bridging switch uses.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call. This parameter also contains the Reorigination Type field, and may contain the following other reorigination fields: Bridge Reorigination Control, UTR Digit, Reorigination Trigger Type, Reorigination Allowed, STR Digit, STR Key Duration at Talking, STR Key Duration at Non-talking, Immediate, and Disconnect Timer.
Calling Party Number	The switches, except bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform provided. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match OSRs on both the services platform and bridging switches.

13 The bridging switch copies the FAR to another FAR, changing the Facility Indicator field that contains the Reorigination value. The bridging switch passes the FAR to the originating switch. In this case, the originating switch deallocates all the reorigination resources (if any) and then allocates new resources as designated in the Operator Information parameter of the FAR.

14 Using translations of the Called Party Number parameter, the bridging switch completes the second leg of the call.

Note: If the Called Party Number parameter contains an N00 services number, the switch supports boomerang reorigination. Refer to Chapter 5, “RLT call scenarios for ESP,” for a description of boomerang reorigination.

15 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the service platform. The services platform then reads the message’s Facility Indicator and performs release link trunking. Table 4-41 shows parameters in this FAA message that affect RLT functionality.

Table 4-41
Important RLT parameters in this Redirect FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the Release Link for Operator Redirect/Transfer value that was in the FAR message.

16 The services platform then sends a Facility Request (FAR) message to the bridging switch. Table 4-42 shows parameters in this FAR message that affect RLT functionality.

Table 4-42
Important RLT parameters in this reorigination FAR message

RLT parameter	Comments
Operator Information	This parameter contains reorigination information in the Reorigination Type field.

17 The bridging switch checks the FAR message. This switch reads and performs the action designated in the FAR message’s Operator Information parameter. In this case, the switch deallocates the reorigination resources and allocates new resources.

Note: The services platform may send a reorigination FAR several times.

18 To acknowledge that it received and processed the FAR message, the bridging switch formats a Facility Accept (FAA) message and sends it to the remote switch, which passes it to the services platform.

19 After bridging the call, the bridging switch formats a Release (REL) message and sends it to the originating switch. The REL message includes a Normal Clearing Cause Indicator parameter.

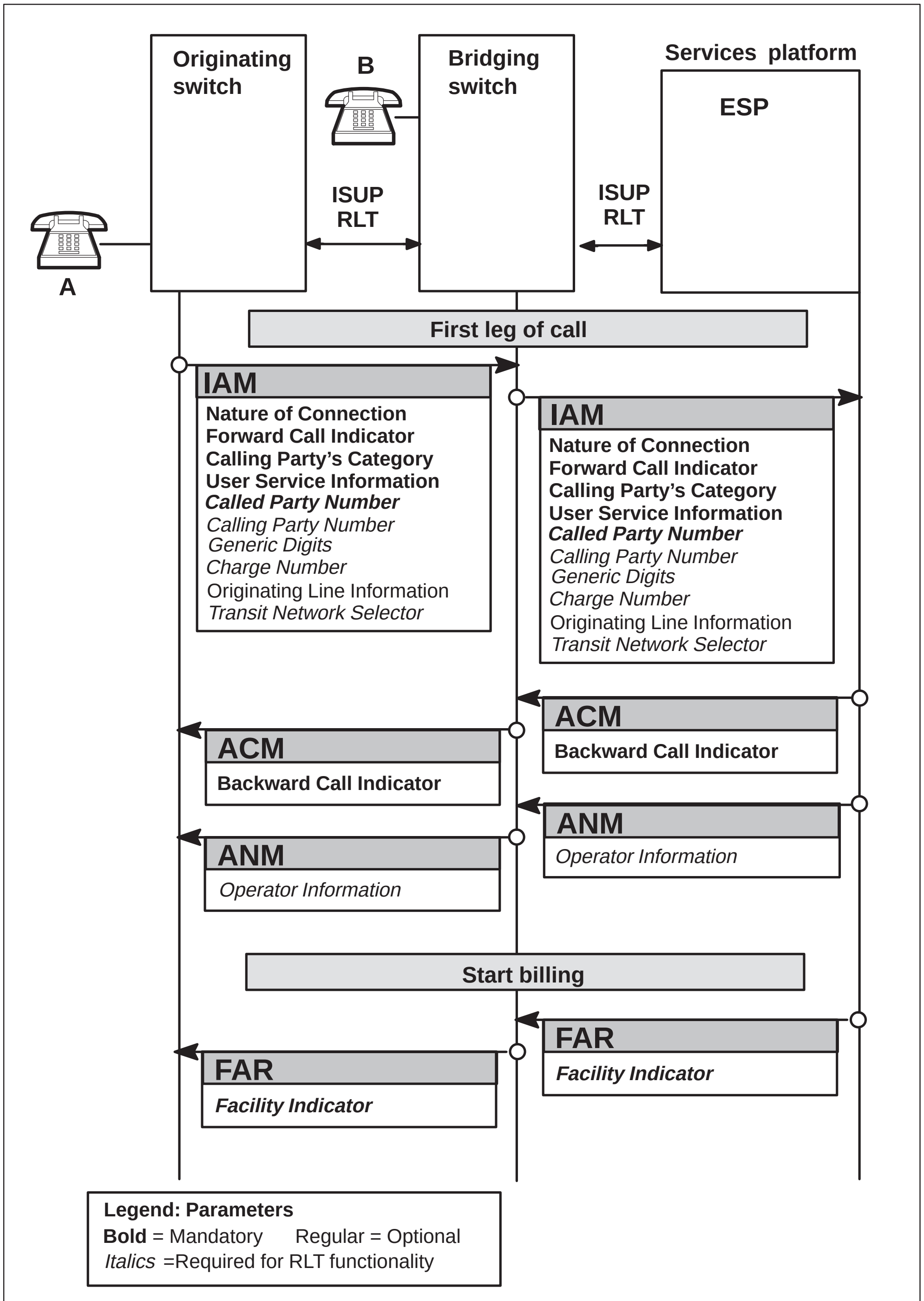
20 The bridging switch sends another REL message to the services platform and releases the connection to the services platform and the corresponding trunks. It also sends a Release Complete (RLC) message back to the bridging switch to confirm the release. This RLC also includes a proper Cause Indicator parameter.

Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

21 The services platform also releases its connections and returns another RLC with a proper Cause Indicator to the bridging switch to confirm the release.

Figure 4-13 is a comprehensive message flow diagram for the reorigination scenario where bridging occurs at a switch other than the originating or services platform.

Figure 4-13
Message flow for reorigination scenario



—continued—

Figure 4-13
Message flow for reorigination scenario (continued)

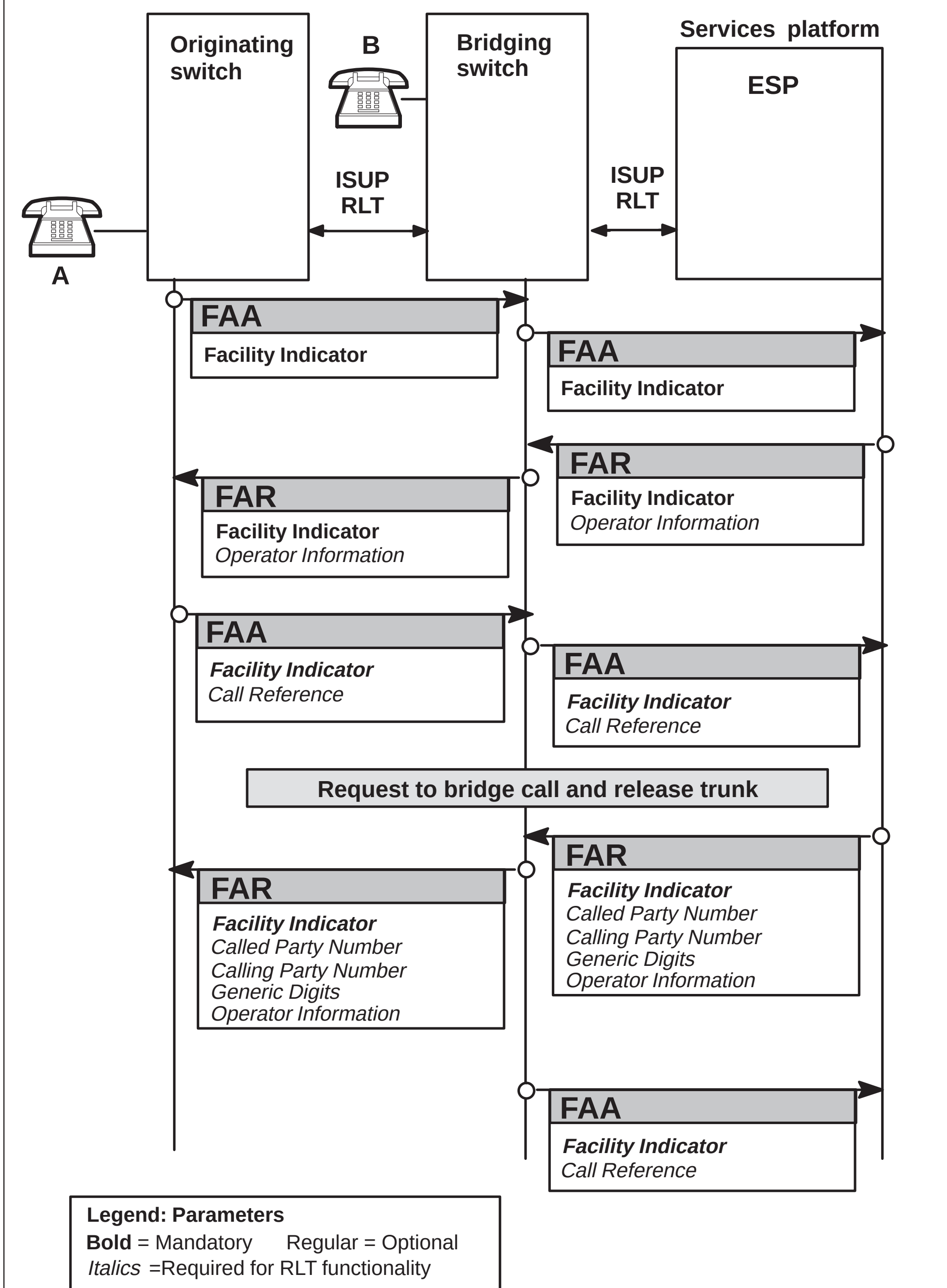


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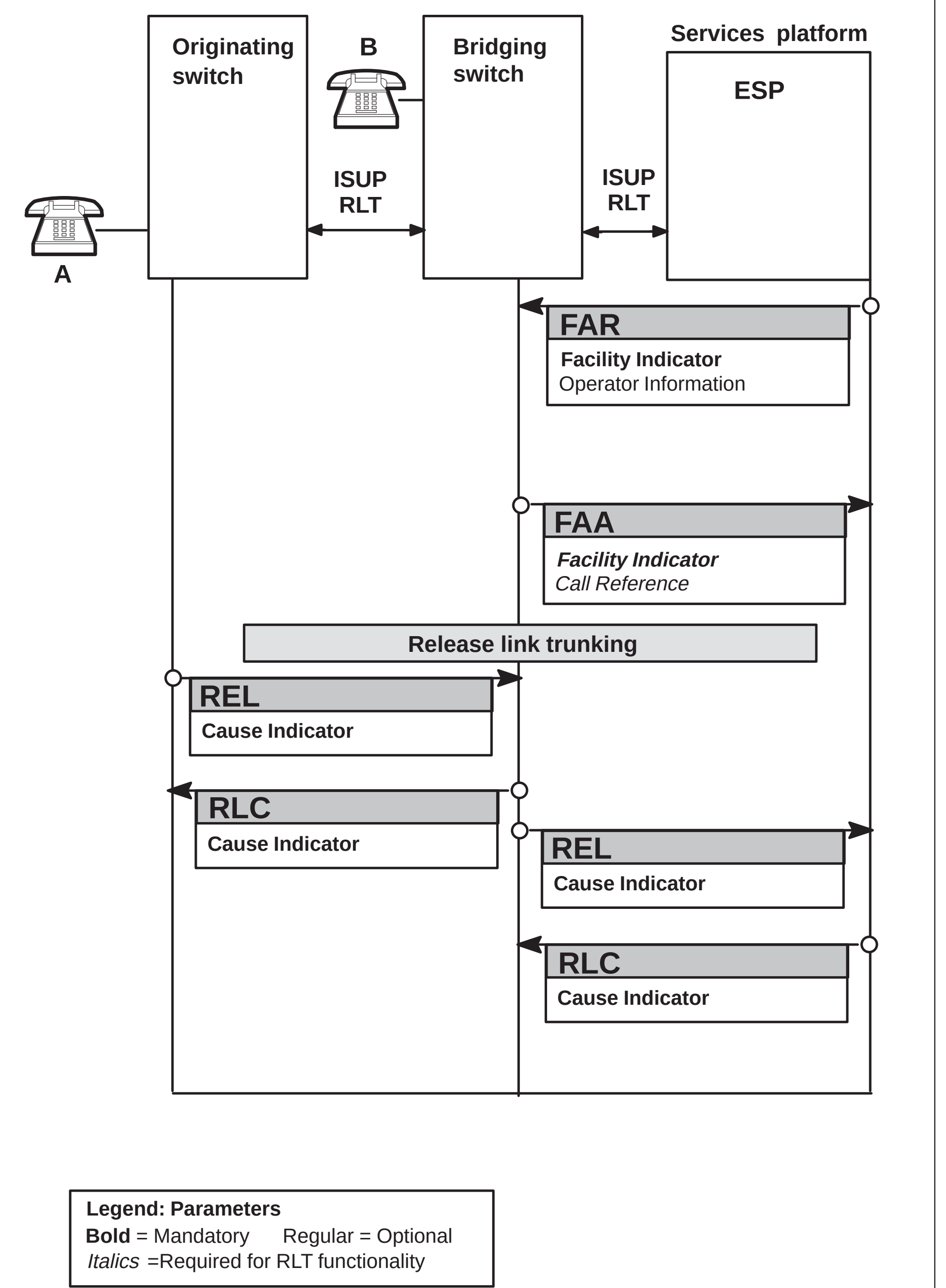
Figure 4-13
Message flow for reorigination scenario (continued)



—end—

Reorigination error scenario, bridging not at originating or services platform

This section explains the message flow for this reorigination scenario, where the call bridging occurs at a switch other than the originating or services platform and, for whatever reason, a UCS DMS-250 switch cannot perform the action requested in the Facility Indicator parameter of a FAR message. In this case, the switch involved does not perform the action requested (such as release link trunking) and cannot complete the call. The switches must process the call using call treatment or other means. The error scenario is identical to the standard reorigination scenario up to step 13.

Message flow for reorigination error scenario

Figure 4-14 is a comprehensive message flow diagram for the reorigination error scenario when bridging occurs at a switch other than the originating or services platform. It shows the sequence for the exchange of messages and parameters between the originating switch, the bridging switch, and the services platform.

Specifically, the message exchange in this error scenario occurs as follows:

1 A switch, the originating switch in this scenario, receives the call. The switches and services platform exchange messages just as in steps 1–13 in the standard reorigination scenario.

2 The services platform then sends a Facility Request (FAR) message to the bridging switch.

3 The bridging switch also checks the FAR message. This switch reads and performs the action designated in the FAR message’s Operator Information parameter. In this case, the switch is unable to deallocate the reorigination resources and allocate new resources.

Note: The services platform may send a reorigination FAR several times.

4 The services platform initiates release link trunking, sending another FAR message to the bridging switch. Table 4-43 shows parameters in this FAR message that affect RLT functionality.

Table 4-43
Important RLT parameters in this Redirect FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for Operator Redirect/Transfer value that the bridging switch uses.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call. This parameter also contains the Reorigination Type field, and may contain the following other reorigination fields: Bridge Reorigination Control, UTR Digit, Reorigination Trigger Type, Reorigination Allowed, STR Digit, STR Key Duration at Talking, STR Key Duration at Non-talking, Immediate, and Disconnect Timer.
Calling Party Number	The switches, except bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform provided. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match OSRs on both the services platform and bridging switches.

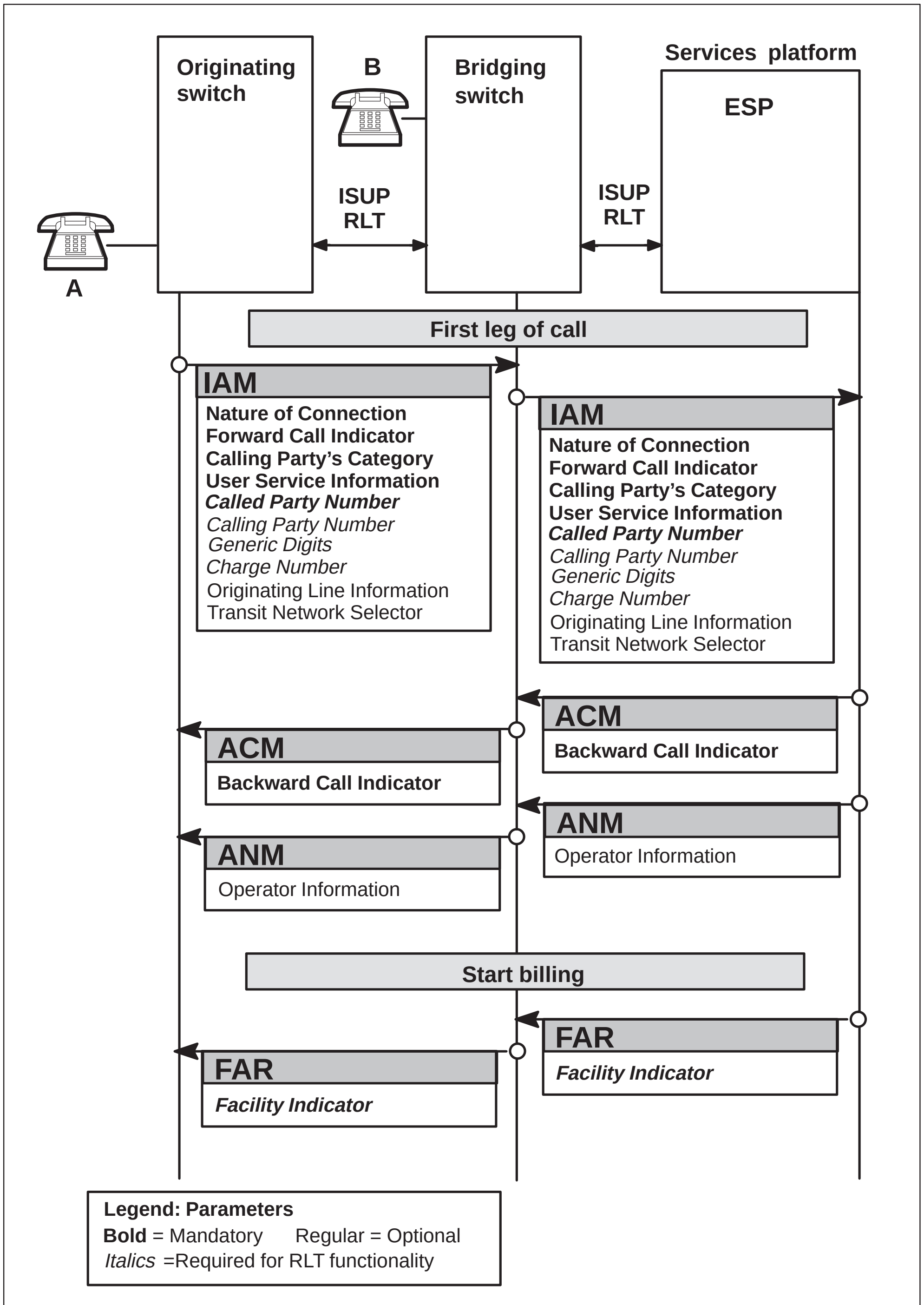
5 The bridging switch checks the Bridge Reorigination Control field in the Operator Information parameter of the FAR. If the field is N, the services platform attempts to redirect at the Bridging switch, regardless of the failure of resource allocation. If the field is Y, the services platform does not attempt to bridge. In this scenario, the Bridge Reorig. Control field is Y.

6 The bridging switch sends an FRJ message to the services platform containing the Cause Value Resource unavailable - unspecified in the Cause Indicator parameter. Table 4-44 shows parameters in this FRJ message that affect RLT functionality.

Table 4-44
Important RLT parameters in this FRJ message

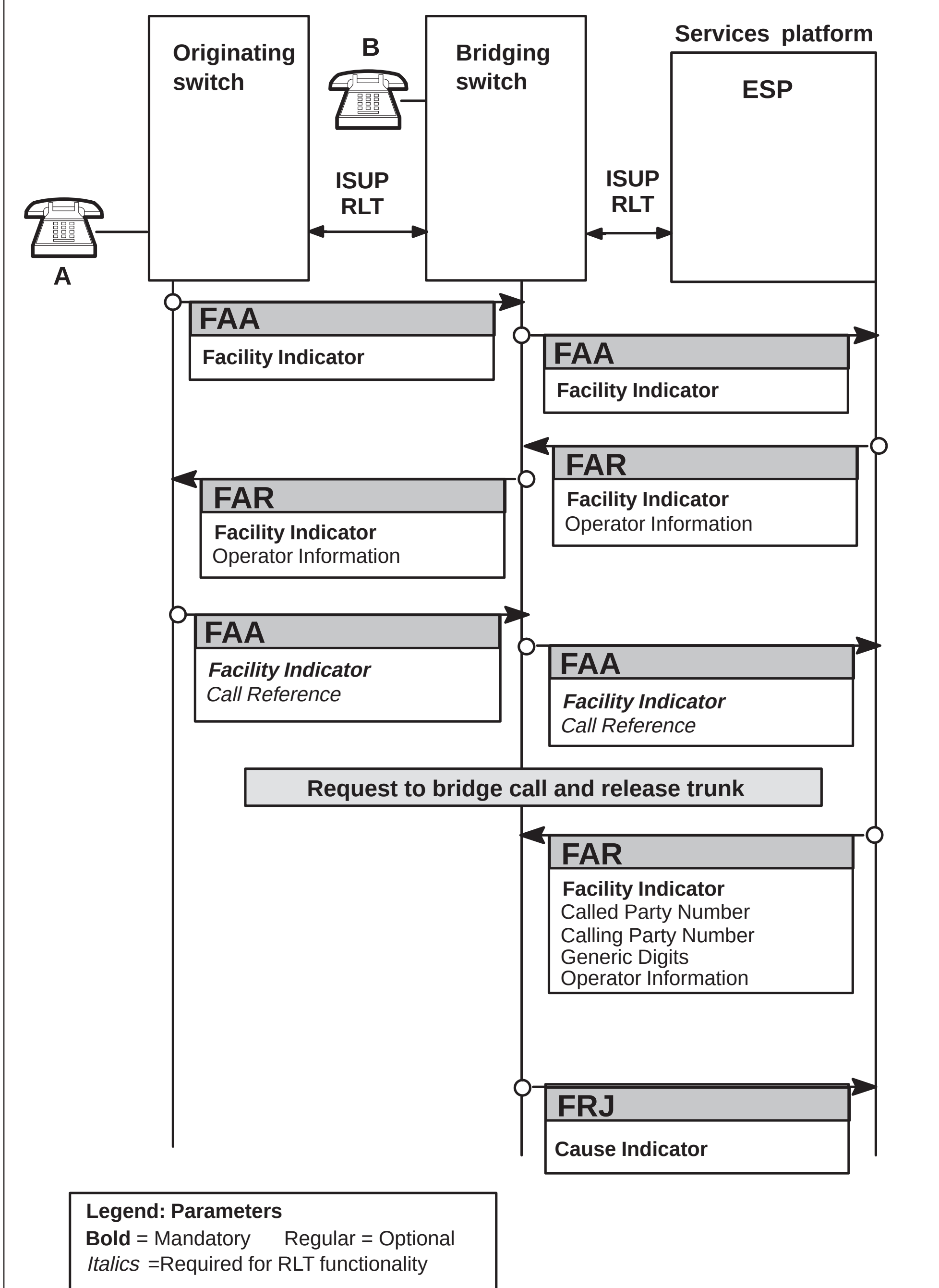
RLT parameter	Comments
Cause Indicator	This parameter contains the value Resource unavailable - unspecified in the Cause Value field.

Figure 4-14
Message flow for reorigination scenario



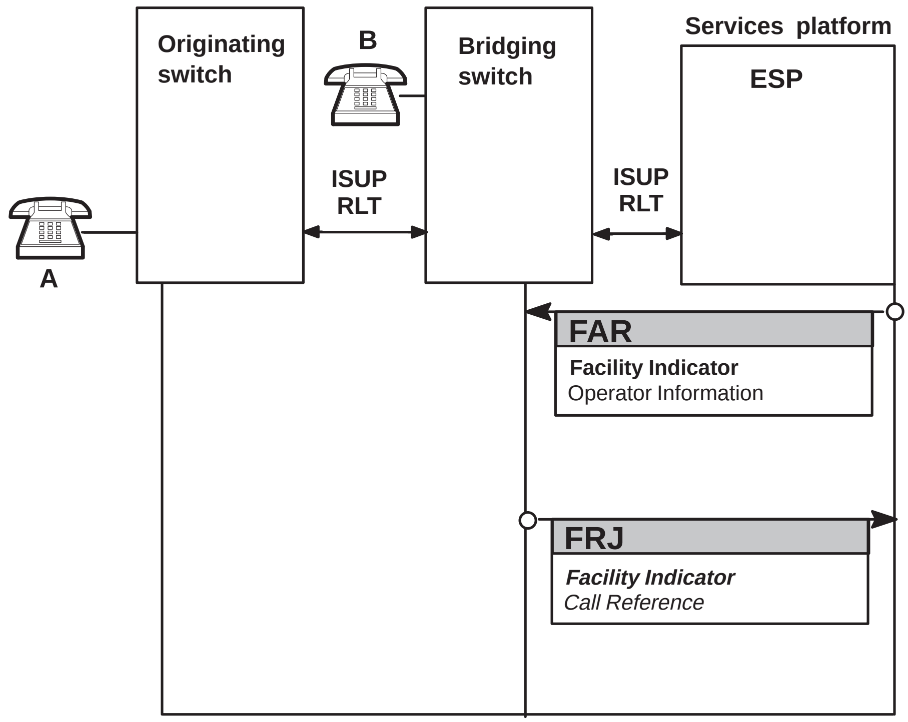
—continued—

Figure 4-14
Message flow for reorigination scenario (continued)



—continued—

Figure 4-14
Message flow for reorigination scenario (continued)



Legend: Parameters
Bold = Mandatory Regular = Optional
Italics =Required for RLT functionality

—end—

RLT call scenarios for ESP

This chapter summarizes the flow of SS7 Integrated Services Digital Network (ISDN) User Part (ISUP) messages between a bridging UCS DMS-250 switch, a remote UCS DMS-250 switch, and an Enhanced Services Provider (ESP) platform. It provides a high-level diagram and a general description for each of the ESP Release Link Trunk (RLT) call scenarios.

An ESP platform is a generic reference to a company that provides specialized switching, billing, and call processing using a software system or systems. An ESP platform can provide enhanced services like calling card, debit card, and voice mail.

For technical descriptions of messages and parameters that the UCS DMS-250 switches exchange in these scenarios, see Chapter 3, “SS7 ISUP RLT messages and protocol.”

Note: The remote switch shown in the diagrams can also be the bridging switch under the proper conditions. For clarity, however, the bridging and remote switches in this chapter’s explanations are not the same switch. Even when the remote switch is the bridging switch, each scenario remains essentially the same.

The scenarios do not explain how a UCS DMS-250 switch generates billing records for each RLT call. For billing information, see Chapter 7, “Billing for RLT calls.”

The following are the RLT call scenarios that specifically involve an ESP:

- boomerang reorigination
- multiple Answer Messages (ANM)

Boomerang reorigination scenario

In this scenario, a customer presses the octothorpe (#) key to request reorigination and the switching network routes the reoriginated call back to an ESP. For boomerang reorigination, the UCS DMS-250 switches use the original dialed number to reoriginate the call. After the appropriate switch bridges the call, the release link trunking capability frees the ESP and the remote switch.

Enhancements to this feature including the following functionality:

- A services platform can send a new FAR (Facility Request) message (Context_Block FAR) containing up to a 100 byte block of context information (Context Block).
- After boomerang reorigination, an Initial Address Message (IAM) sent back to the services platform indicates whether the UCS DMS-250 switch has the context block sent previously in the Context_Block FAR. This message also includes information about the state of the call (connecting, talking, or disconnecting) at the time of reorigination.
- The services platform retrieves the context block by sending the new FAR, Request_Context_Block.
- The UCS DMS-250 switch, upon receiving the new Request_Block FAR, sends the context block back in an FAA (Facility Accept) message.

Limitations and restrictions

- The feature is supported by ESP only.
- All switches in the network must have the UCS08 or higher software load in order to make use of the context block functionality. Otherwise, the call context block is lost because no explicit messaging is supported to inform the nodes in the network of the loss of information.
- The context block is sent by the services platform over SS7 IMTs with the RLT capability until the Context Block reaches a switch whose originating trunk is not an SS7 IMT with RLT capability. The switch that holds the context block must physically exist where reorigination is handled.
- The information sent by the services platform in the context block is not parsed by the UCS DMS-250 switch and is not recorded in the billing record.
- Table RTEATTR controls the capability to include/exclude generic digits within IAM messages.
- Table TRKGRP’s PARMBLK excludes generic digits within IAM messages.

- The SS7 IMTs with RLT capabilities need to be network specific (the field NETWKSPC in table TRKGRP must be populated with INTER).
- The option TMCICBLK_TNS needs to be placed on the SS7 IMTs on the UCS DMS-250 side, which prevents the TNS from being added to the IAM message.

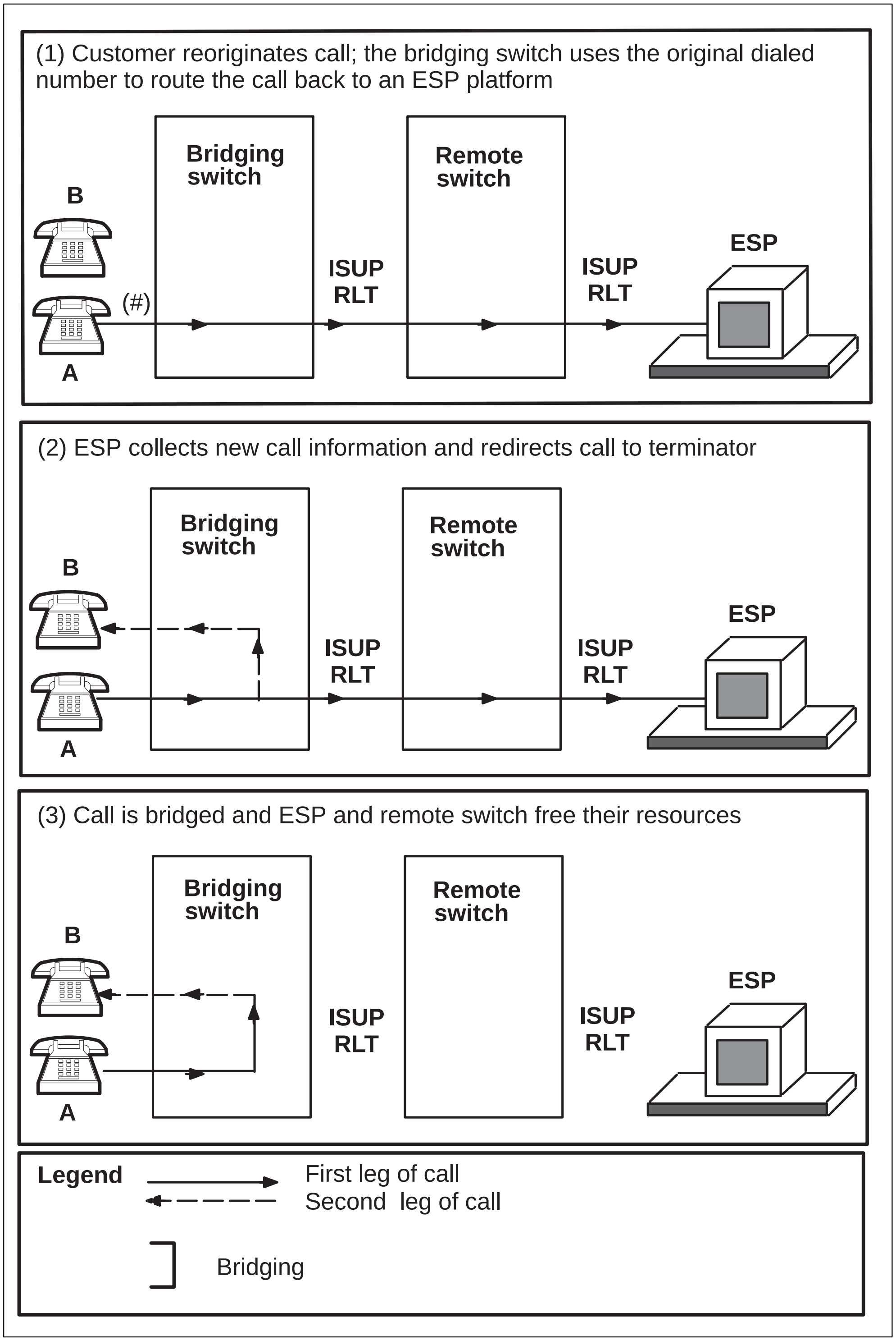
The trunks connecting the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and the ESP platform are all ISUP intermachine trunks with RLT functionality. The trunk connecting the caller to the bridging switch is one of the following:

- a per-trunk signaling (PTS) trunk
- an ISUP FGD trunk

By definition, a switch only bridges a call when it cannot remove itself from the connection by passing the bridge request to another switch.

Figure 5-1 is a high-level diagram of the boomerang reorigination scenario.

Figure 5-1
Boomerang reorigination scenario



Message flow for boomerang reorigination scenario without the Context Block

Figure 5-2 is a comprehensive message flow diagram for the boomerang reorigination scenario without the context block. It shows the sequence for the exchange of messages between the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and the ESP.

Specifically, the message exchange occurs as follows:

1 Upon completion of the original call, the bridging switch releases the call’s terminator, but the call’s originator stays on line.

2 The call’s originator presses the octathorpe (#) key to reoriginate the call. Upon reorigination, the bridging switch formats an Initial Address Message (IAM) and sends it to the remote switch. The remote switch passes the IAM to an ESP. Table 5-1 shows RLT-related parameters in the IAM.

3 This IAM contains a Generic Digits (GD) parameter that includes a Call Identification (CALLID) value that identifies the previous call. The CALLID is obtained from either the Call Reference received in the Answer Message (ANM) or from the GD parameter received in the Facilities Request (FAR).

- — The ESP can send the CALLID value in the Call Reference of the ANM to the bridging UCS DMS-250 switch (refer to Note 2, Page 3-18). If no CALLID is received in the GD of the FAR, the CALLID in the Call Reference of the ANM is used to populate the GD of the IAM.
- — The CALLID value obtained from the GD parameter of the FAR message is ESP generated as well. If the CALLID is received in the GD of the FAR, the CALLID in the GD of the FAR is used to populate the GD of the IAM. If the CALLID in the Call Reference of the ANM and the CALLID in the GD of the FAR are both received, the CALLID in the GD of the FAR takes precedence and is used to populate the GD of the IAM.

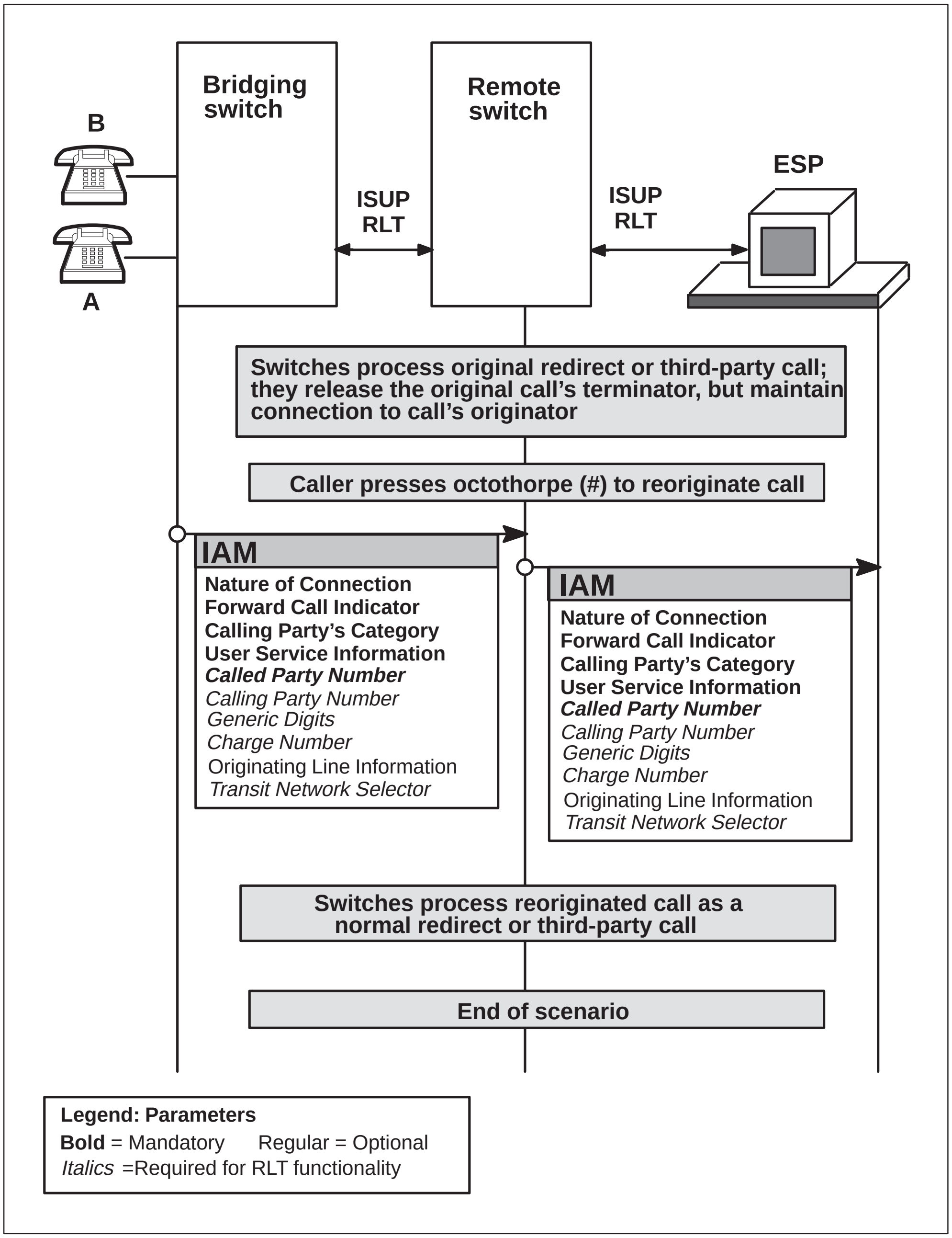
Note: The CALLID referred to in this section is not the same as the UCS DMS-250 generated CALLID that the Bridging FAR messages contain in the Call Reference parameter. The UCS DMS-250 switch generated CALLID was used to identify the call identity of the second call leg which is used for bridging purposes. The Bridging FAR can be received with a CALLID (UCS DMS-250 generated) in the Call Reference parameter and a CALLID (ESP generated) in the GD parameter. Only the CALLID received in the GD parameter is used to populate the GD CALLID value sent in the IAM upon reorigination.

Table 5-1
Important RLT parameters in first leg IAM

RLT parameter	Comments
Called Party Number	The switches use the number of the party called when generating billing records. The switches place this value in the Called Number field of the CDR for the call. This parameter also provides an NOA value that indicates whether the call is operator-assisted or whether the switch must treat the call.
Generic Digits	This parameter contains the CALLID value from the original call.
Charge Number	This parameter contains an ANI value. If the IAM contains this parameter, the switches add this value to the ANI SPILL field in the call’s CDR. If the IAM does not contain this parameter, the switches get the ANI value from the Calling Party Number parameter.
Calling Party Number	This parameter contains an ANI value. The switches add this value to the ANI SPILL field in the call’s CDR, unless they pull the ANI value from the Charge Number parameter.
Transit Network Selector	This parameter’s Reorigination Call field identifies that the call is a boomerang reorigination call. ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

4 Using the appropriate means based on the call’s type, the ESP and switches process the call as described in other call scenarios. For ESP redirect and transfer calls, see steps 5–14 in the section titled “Message flow for the redirect and transfer scenario,” in Chapter 4 “Common RLT call scenarios.” For ESP third-party interaction calls, see steps 5–21 in the section titled “Message flow for third-party interaction,” in Chapter 4.

Figure 5-2
Message flow for boomerang reorigination scenario without the context block scenario



Message flow for boomerang reorigination with context block scenario

Figure 5-3 is a comprehensive message flow diagram for the reorigination with context block scenario. Figure 5-4 shows the message flow diagram when an extension block is not available. These two figures illustrate a message flow diagram for a card services call which uses context blocks.

Note: All switches in the network must have a UCS08 or higher software load in order to make use of the context block functionality. If the switches do not all have the required load installed, the call context block information gets lost. Because there is no explicit messaging, the nodes in the network do not receive the information contained in the call context block.

Specifically, the message exchange occurs as follows:

1 The calling party initiates an operator–related call requiring card validation.

2 The services platform collects and validates the card information.

3 The services platform sends the context block information to the switch in the context block FAR. When the services platform sends more than one context block FAR to the switch, the switch stores the most recent one.

4 The switch sends back an FAA message to the services platform, indicating successful storage of the context block.

5 The services platform sends a notice that subsequent reoriginations must be boomerang reoriginations in the operator information parameter of the bridging FAR.

6 The UCS DMS-250 switch sends an FAA message back to the services platform indicating success of bridging.

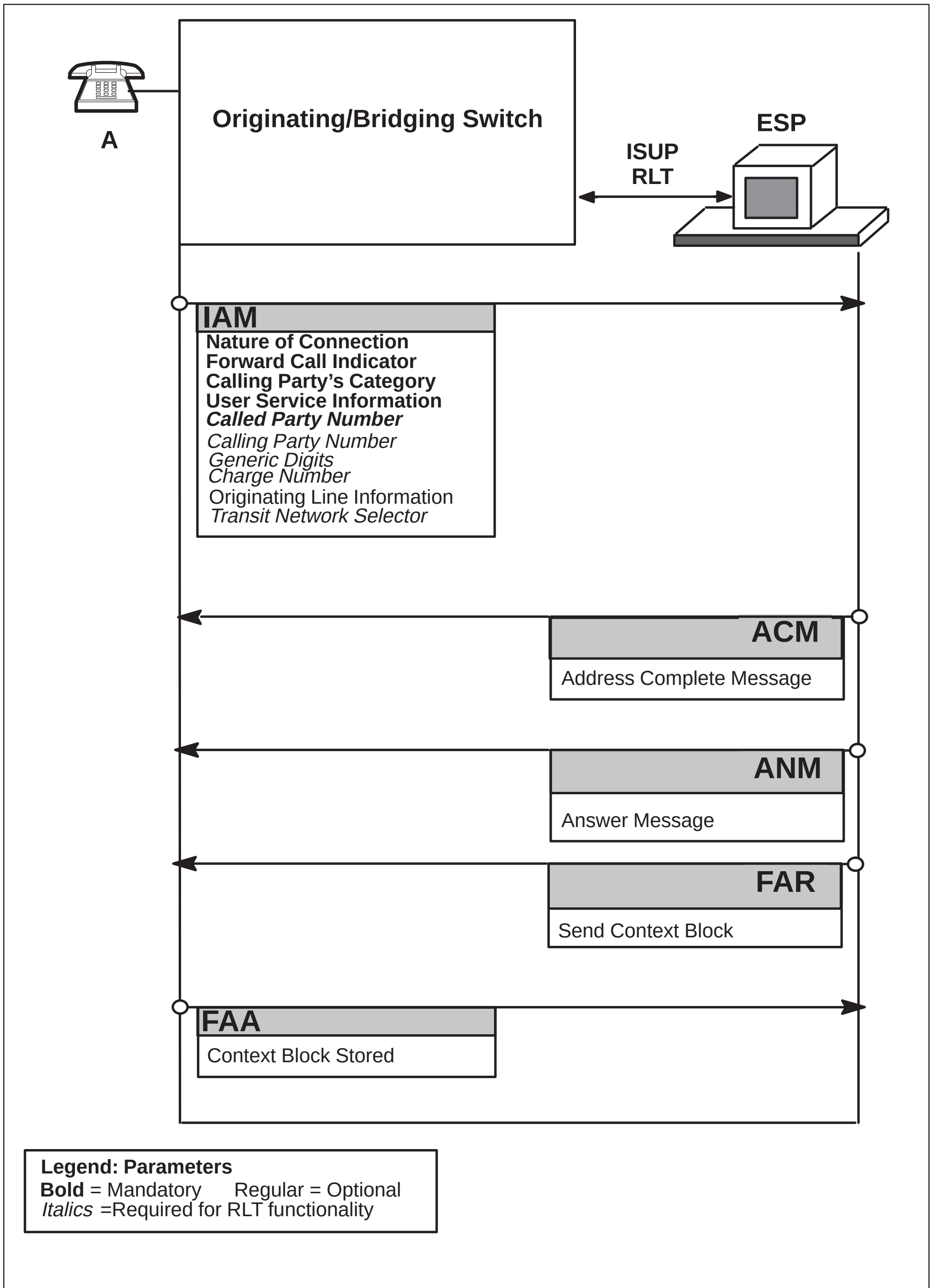
7 After the call bridges and the caller decides to reoriginate, the switch boomerangs the call back to the services platform (when reorigination is allowed). The new field in the generic digits parameter (located in the IAM message sent back to the services platform) indicates context block availability, as well as call state at the time of reorigination (connecting, talking, or disconnect).

8 If the context block is required, the services platform sends a request for context block to the switch using the new request context block FAR.

9 The switch sends the context block to the services platform in an FAA message.

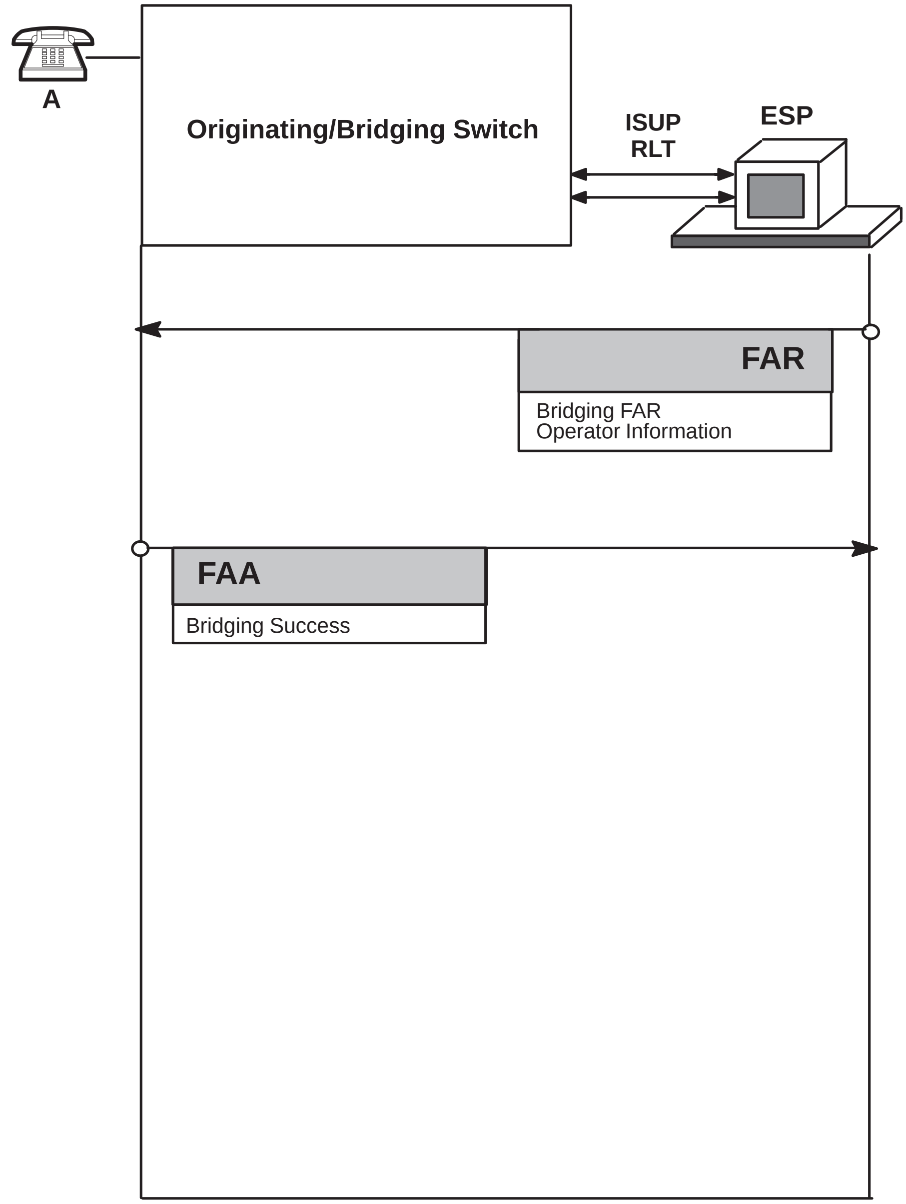
10 The services platform retrieves the context information, eliminating the need for reentry of information (calling card number or language, for example).

Figure 5-3
Message flow for boomerang reorigination with context block scenario



—continued—

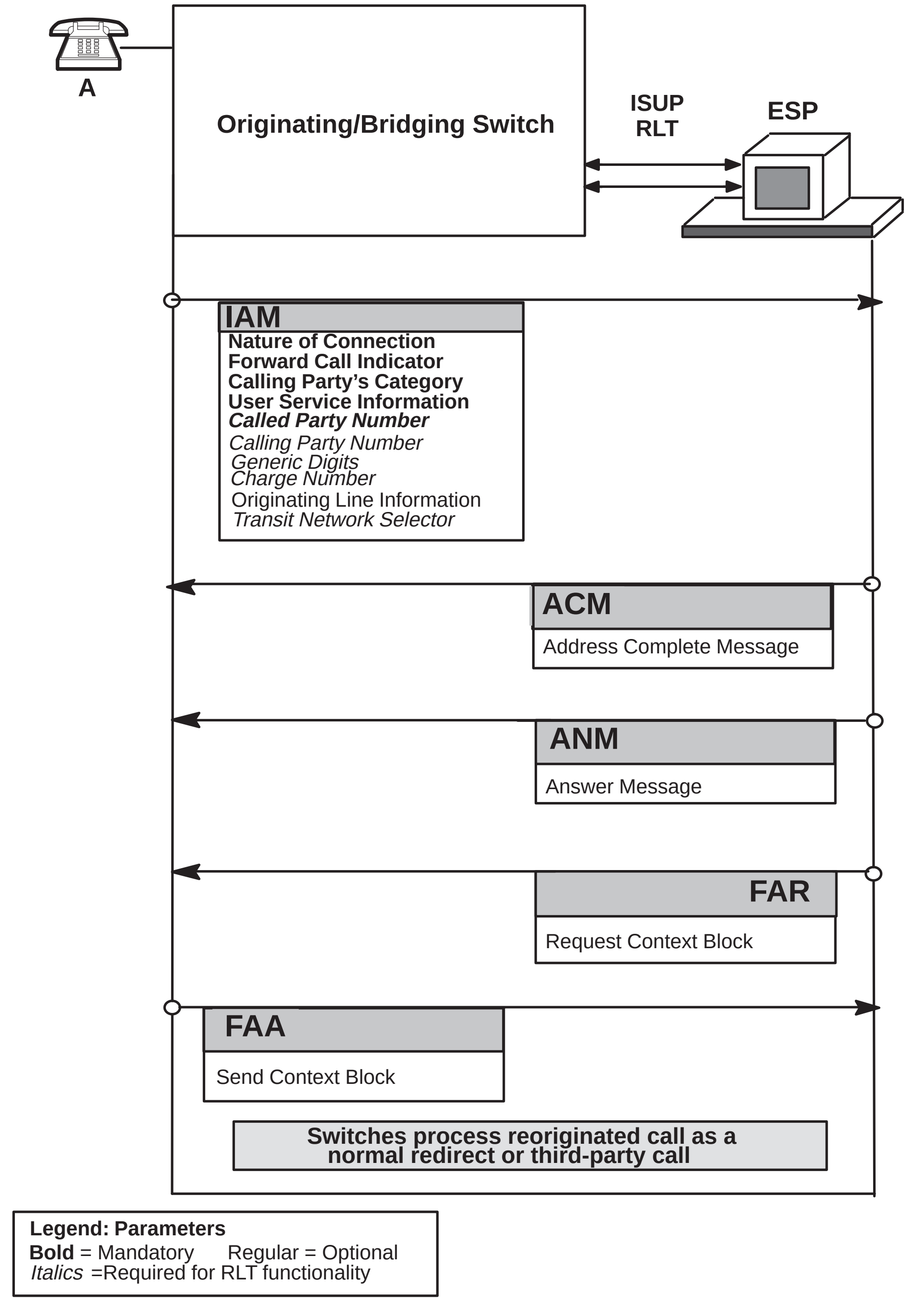
Figure 5-3
Message flow for boomerang reorigination with context block scenario
(continued)



Legend: Parameters
Bold = Mandatory Regular = Optional
Italics =Required for RLT functionality

—continued—

Figure 5-3
Message flow for boomerang reorigination with context block (continued)



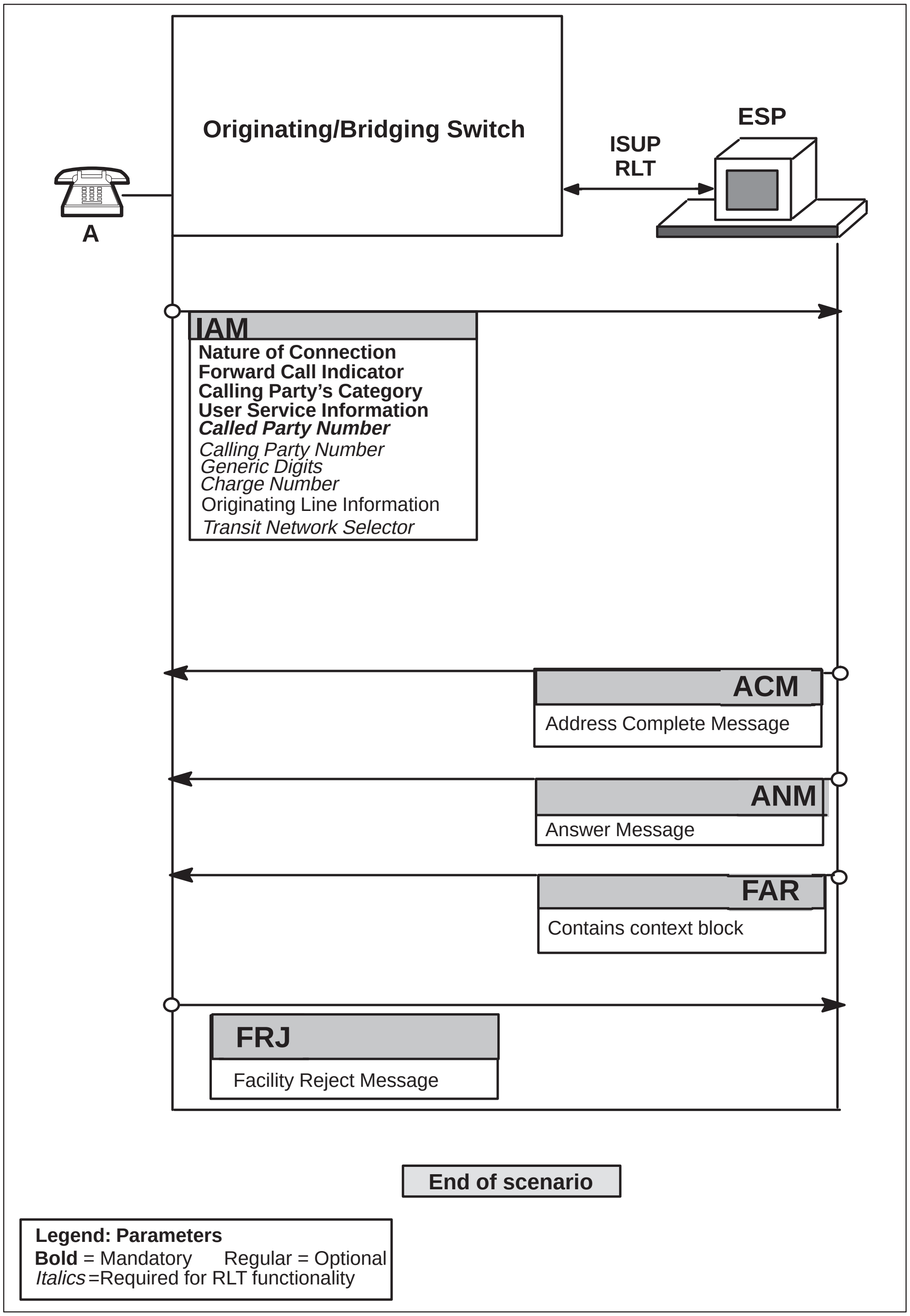
—end—

Message flow for boomerang reorigination with context block, extension block unavailable error scenario

Reorigination functionality for card services calls depend on the availability of extension blocks. When there are not enough extension blocks available, an error occurs. The message flow when an extension block is unavailable follows:

1. The services platform collects and validates the card information
2. The services platform sends the context block information to the switch in the new Context_Block FAR.
3. The UCS DMS-250 switch sends a Facility Reject (FRJ) message to the services platform indicating unsuccessful storage of the context block (cause value = 43 dec. User Information Discarded). A limited amount of extension blocks for the storage of context blocks at the UCS DMS-250 reoriginating switch causes this problem.

Figure 5-4
Message flow for boomerang reorigination with context block, extension block unavailable scenario

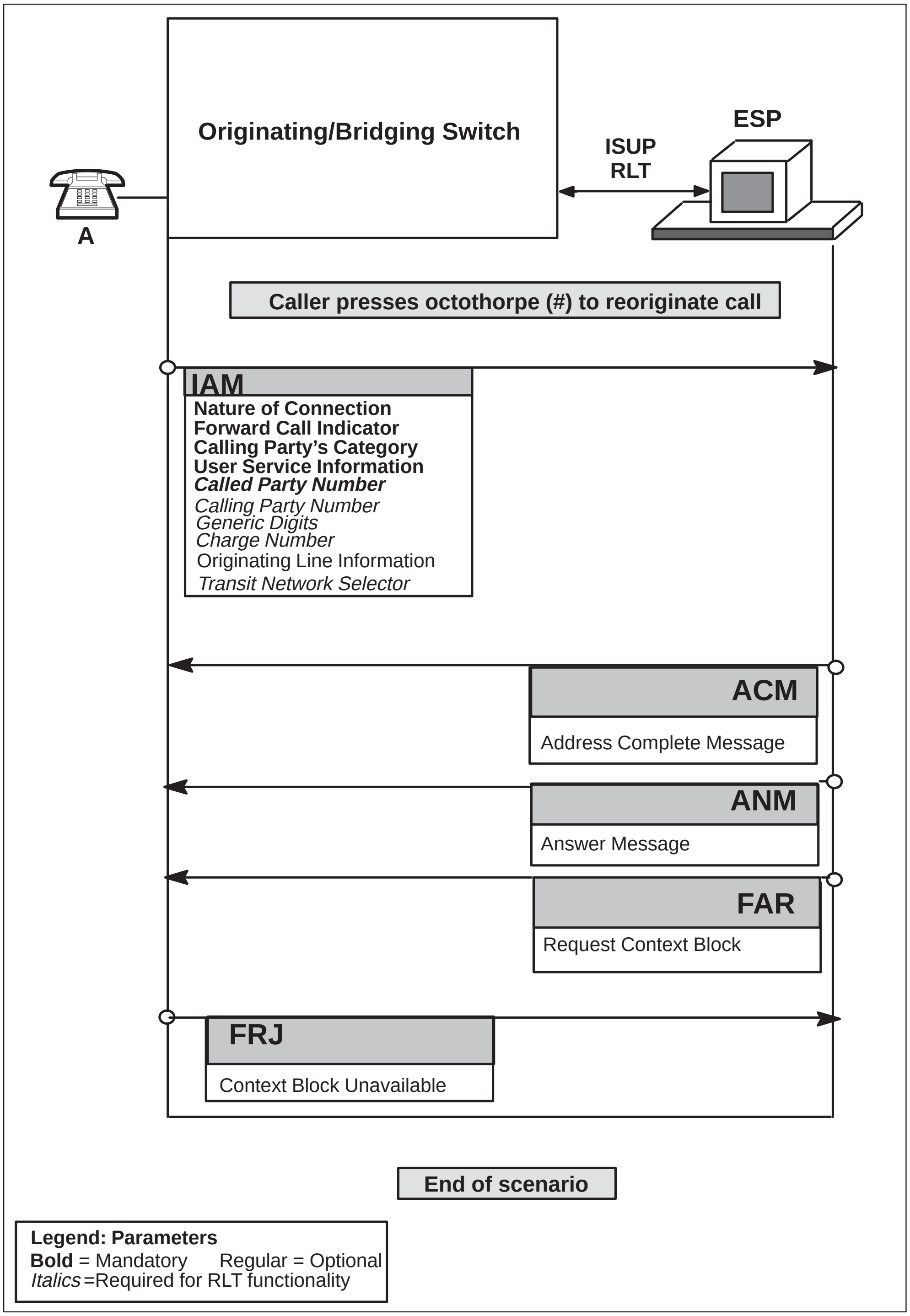


Message flow for boomerang reorigination with context block not stored scenario

The following text describes the message flow between the ESP and the UCS DMS-250 switch when a context block has not been stored for a card services call. Figure 5-5 shows the message flow scenario.

1. The services platform collects and validates the card information.
2. The services platform sends the context block information to the originating UCS DMS-250 switch in the new Context_Block FAR.
3. The UCS DMS-250 switch sends a Facility Reject (FRJ) message to the services platform indicating unsuccessful storage of the context block (cause value = 43 dec. User Information Discarded). A limited amount of extension blocks for the storage of context blocks at the UCS DMS-250 reoriginating switch causes this problem.
4. The services platform sends the indication that subsequent reoriginations should be boomerang reoriginations. The services platform initiates RLT bridging.
5. After the call bridges and the caller decides to reoriginate, the UCS DMS-250 switch boomerangs the call back to the services platform.
6. The UCS DMS-250 switch sends the IAM message back to the services platform without indication of the context block's availability.
7. The services platform sends a request for a context block to the UCS DMS-250 switch using the Request_Context_Block FAR.
8. The UCS DMS-250 switch sends the FRJ message back to the services platform indicating that the context block is unavailable (cause value = 47 dec.).

Figure 5-5
Message flow for boomerang reorigination with context block not stored



Multiple Answer Message scenario

Some ESPs allow a customer to select services options that require the ESP to route the call to another ESP. This ESP may also allow the customer to select services that route the call to subsequent ESPs. In this way, switches may generate multiple ANMs for one call involving several ESPs.

For calls with multiple ANMs, the remote switch produces a CDR with a CALLDUR (call duration) value based on the time stamp for the last ANM it receives from an ESP. To set the switch to produce a CDR based on the first ANM that it receives from an ESP, set office parameter RLT_FIRST_ANM_BILLING to Y. (Refer to Page 2-13). The UCS DMS-250 switch and telecommunications network software determines which method the remote switch uses.

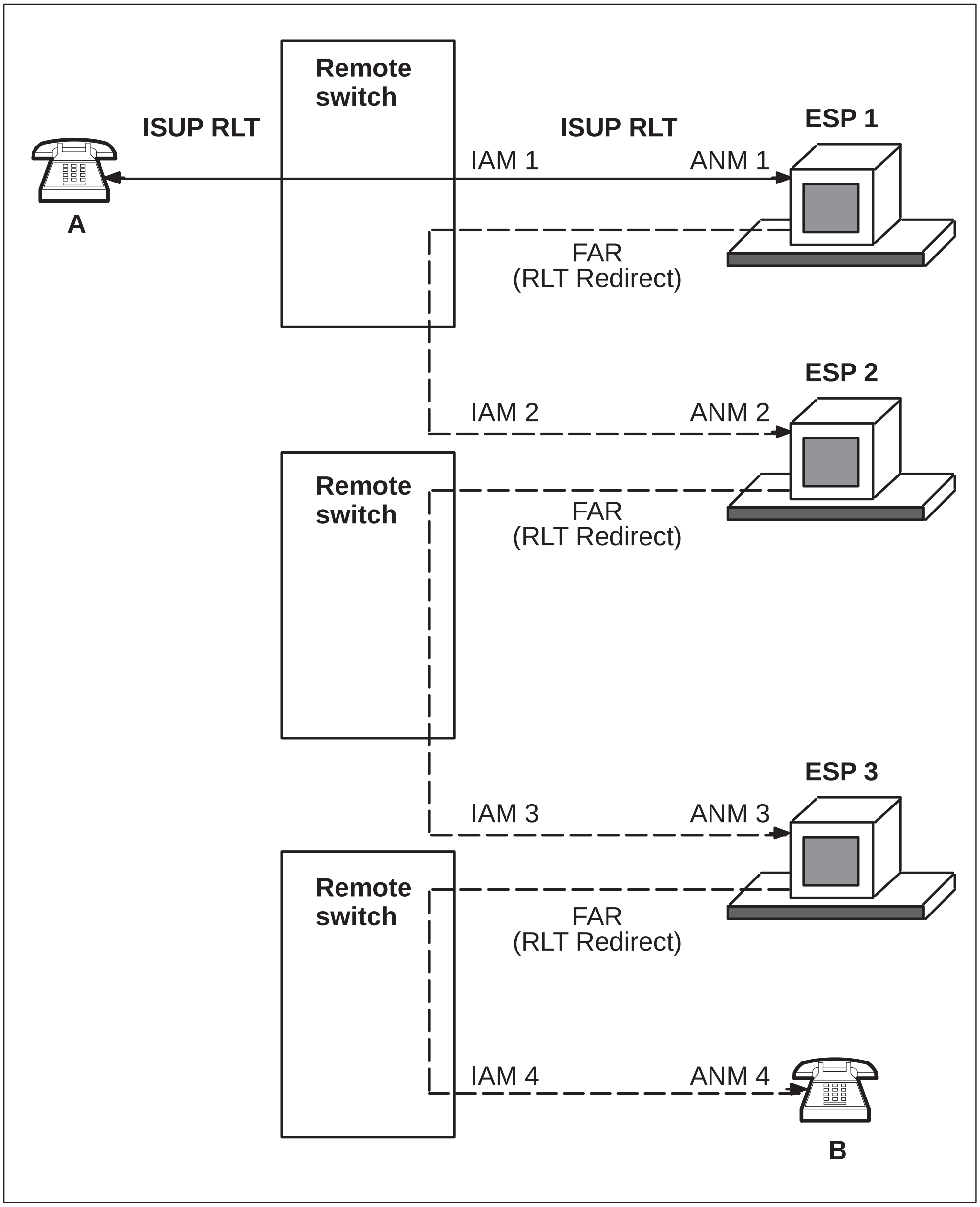
Figure 5-6 is a high-level diagram of the Multiple Answer Message scenario.

Table 5-2 shows how the switches determine CALLDUR values depending on the point at which the caller or switching network discontinues the call. It uses the ANM and ESP numbering shown in Figure 5-6. For more information on billing and the CALLDUR field for CDRs, see Chapter 7, “Billing for RLT calls.”

Table 5-2
CALLDUR value depending on point of disconnection

Point of call disconnection	CALLDUR based on time stamp of first ANM	CALLDUR based on time stamp of last ANM
ANM 1	Time at ESP 1	Time at ESP 1
ANM 2	Time at ESP 1 + time at ESP 2	Time at ESP 2 *only*
ANM 3	Time at ESP 1 + time at ESP 2 + time at ESP 3	Time at ESP 3 *only*
ANM 4	Time at ESP 1 + time at ESP 2 + time at ESP 3 + time at terminator (B)	Time at terminator (B) *only*

Figure 5-6
Multiple Answer Message scenario



RLT call scenarios for non-operator (0+, 0–) calls

This chapter summarizes the flow of Signaling System 7 (SS7) Integrated Services Digital Network (ISDN) User Part (ISUP) messages between UCS DMS-250 switches and a services platform that supports Release Link Trunk (RLT) capabilities for non-operator calls. An Enhanced Services Provider (ESP) is an example of a services platform. An ESP platform is a system that provides specialized switching, billing, and call processing features.

This chapter describes non-operator RLT scenarios for an ESP platform. Non-operator calls are calls without a 0– or 0+ address. Each scenario describes the SS7 ISUP messaging between a bridging UCS DMS-250 switch, a remote UCS DMS-250 switch, and a services platform. The scenarios highlight parameters that the ISUP messages contain. For technical descriptions of messages and parameters, Refer to Chapter 3, “SS7 ISUP RLT messages and protocol.”

When the office parameter ALL_RLT_OPR_CALLS is Y, the bridging and remote UCS DMS-250 switches treat all calls, including non-operator calls, as operator services calls. When this office parameter is set to N, these switches treat non-operator RLT calls differently than operator services calls, especially regarding reorigination functionality. By separating non-operator calls from operator services calls, the bridging and remote switches can allow non-operator calls to reoriginate before bridging, or reoriginate where no bridging occurs.

Scenarios occurring when the originating switch allows normal reorigination at origination

The following scenarios can occur when the originating switch allows normal reorigination at or upon origination:

- Normal Reorigination in the REORIG_TYPE field in the ANM and the originating switch is the bridging switch
- Boomerang Reorigination in the REORIG_TYPE field in the ANM and the originating switch is the bridging switch

- No Reorigination in the REORIG_TYPE field in the ANM and the originating switch is the bridging switch
- Normal Reorigination in the REORIG_TYPE field in the ANM and the originating switch is different from the bridging switch
- Boomerang Reorigination in the REORIG_TYPE field in the ANM and the originating switch is different from the bridging switch
- No Reorigination in the REORIG_TYPE field in the ANM and the originating switch is different from the bridging switch
- Normal Reorigination in the REORIG_TYPE field in the ANM and the the services platform does not allow bridging
- Boomerang or No Reorigination in the REORIG_TYPE field in the ANM and the the services platform does not allow bridging

The trunks connecting the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform is an ISUP intermachine trunk (IMT) with RLT functionality. The trunk connecting the caller to the bridging switch is one of the following:

- a per-trunk signaling (PTS) trunk
- a primary rate interface (PRI) trunk
- an ISUP FGD trunk
- an ISUP IMT without RLT functionality

By definition, a switch only bridges a call when it cannot remove itself from the connection by passing the bridge request to another switch.

Note: PRI trunks and ISUP IMTs do not support call reorigination.

Normal Reorigination in the REORIG_TYPE field in the ANM and the originating switch is the bridging switch

Figure 6-1 is a comprehensive message flow diagram for this redirection scenario. It shows the sequence for the exchange of messages and parameters between the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform.

Specifically, the message exchange occurs as follows:

1 The originating switch, the bridging switch in this scenario, receives a non-operator call and allows it to normally reoriginate. The switch allocates reorigination resources for the call. Then the switch issues an Initial Address Message (IAM) and sends it to another switch, the remote switch in this scenario. The IAM includes a standard Nature of Address and the IAM does not build a Generic Digits or Transit Network Selector parameter.

2 In response to the IAM from the bridging switch, the remote switch sends another IAM to the services platform. Table 6-1 shows parameters in this IAM that affect RLT functionality.

Table 6-1
RLT parameters in the IAM

RLT parameter	Comments
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (Refer to Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

3 The services platform returns an Address Complete message (ACM) to the remote switch. The remote switch passes the ACM to the bridging switch.

4 When the services platform answers the call, the platform sends an Answer Message (ANM) to the remote switch. The remote switch formats and sends another ANM to the bridging switch. The ANM contains the REORIGINATION_TYPE field in the Operator Information parameter set to Normal Reorigination. This ANM instructs the originating switch to continue to allocate reorigination resources for the call. Table 6-2 shows parameters in this ANM that affect RLT functionality.

Table 6-2
RLT parameters in the ANM

RLT parameter	Comments
Operator Information	This parameter's Reorigination Type field determines what type of reorigination, if any, switches can perform for the call In this scenario, this field is set to No Reorigination.
Note 1: The ANM includes a Call Reference or Operator Information parameter only when the switch has feature (URLT0002).	
Note 2: Only ESPs with proper programming return this parameter in ANMs.	

5 The services platform identifies the called party, but does not make the call to that party. First, it initiates billing by sending a Facility Request (FAR) message to the remote switch. Table 6-3 shows parameters in this FAR message that affect RLT functionality.

Table 6-3
RLT parameters in the billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this message, this parameter contains a Start Billing Time value that the bridging switch uses.

6 The remote switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch.

7 The bridging switch also checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. In this message, the indicator starts billing.

Note 1: In this example, the services platform, remote, and bridging switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a UCS DMS-250 switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message's Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the bridging switch and the remote switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

8 To acknowledge that it received and processed the FAR message, the bridging switch formats a Facility Accept (FAA) message and sends it to the remote switch, which passes it to the services platform. Table 6-4 shows parameters in this FAA message that affect RLT functionality.

Table 6-4
RLT parameters in the Billing FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this message, it contains the same Start Billing Time value that was in the FAR message.

9 The services platform initiates release link trunking, sending another FAR message to the remote switch. Table 6-5 shows parameters in this FAR message that affect RLT functionality.

Table 6-5
RLT parameters in the Redirect FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for Operator Redirect/Transfer value that the bridging switch uses.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.
Calling Party Number	The switches, except the bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's merged CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's merged CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform can provide. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match the billing records on the services platform and bridging switch.

10 The remote switch passes the FAR to the bridging switch. Because the trunk connecting the bridging switch to the switch from which it originally received the call does not support RLT functionality, it reads the message's Facility Indicator and performs release link trunking. Using translations of the Called Party Number parameter, the bridging switch completes the call.

Note: If the Called Party Number parameter contains an N00 services number, the switch supports boomerang reorigination. Refer to Chapter 5, "RLT call scenarios for ESP," for a description of boomerang reorigination.

11 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the remote switch, which passes it to the services platform. Table 6-6 shows parameters in this FAA message that affect RLT functionality.

Table 6-6
RLT parameters in the Redirect FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the Release Link for Operator Redirect/Transfer value that was in the FAR message.

12 After bridging the call, the bridging switch formats a Release (REL) message and sends it to the remote switch. The REL message includes a Normal Clearing Cause Indicator parameter.

13 The remote switch sends another REL message to the services platform and releases the connection to the services platform and the corresponding trunks. It also sends a Release Complete (RLC) message back to the bridging switch to confirm the release. This RLC also includes a proper Cause Indicator parameter.

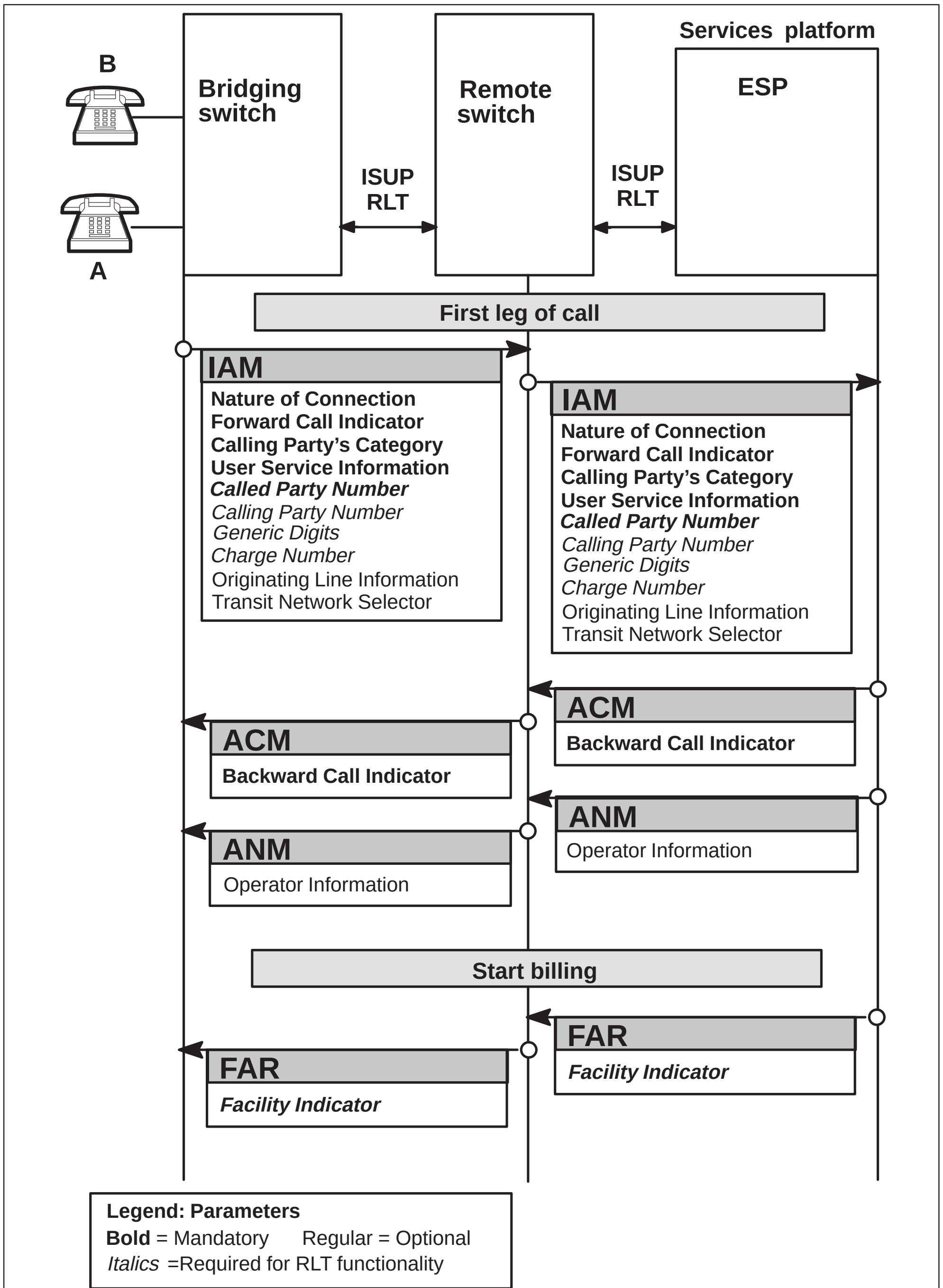
Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

14 The services platform also releases its connections and returns another RLC with a proper Cause Indicator to the remote switch to confirm the release. Table 6-7 shows the complete reorigination timeframe for this scenario.

Table 6-7
Reorigination timeframe

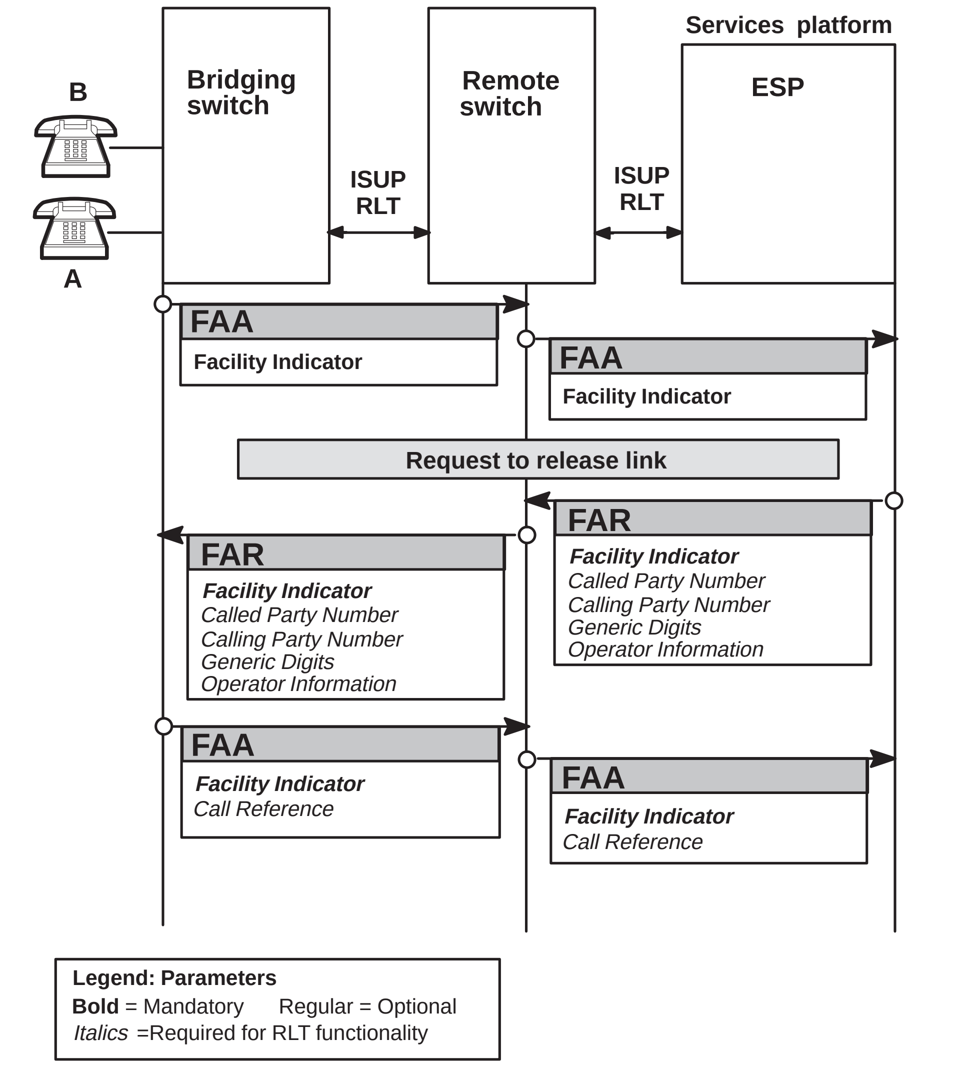
After origination to the receipt of ACM	Between the receipt of ACM and ANM	Between the receipt of ANM and bridging FAR	After bridging FAR to call takedown
The switch allows reorigination	The switch allows normal reorigination	The switch allows normal reorigination	The switch allows normal reorigination

Figure 6-1
Message flow for non-operator RLT call scenarios (originating switch as bridging switch)



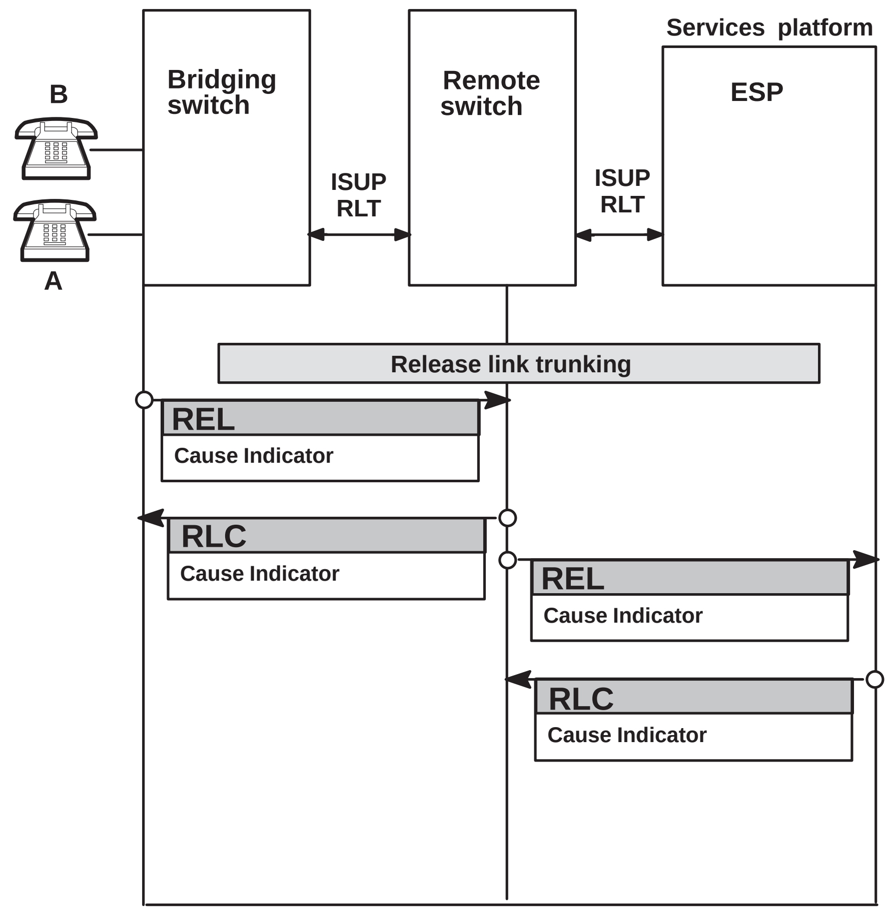
—continued—

Figure 6-1
Message flow for non-operator RLT call scenarios (continued)



—continued—

Figure 6-1
Message flow for non-operator RLT call scenarios (originating switch as bridging switch) (continued)



Legend: Parameters
Bold = Mandatory Regular = Optional
Italics =Required for RLT functionality

—end—

Boomerang Reorigination in the REORIG_TYPE field in the ANM and the originating switch is the bridging switch

Figure 6-1 is a comprehensive message flow diagram for this redirection scenario. It shows the sequence for the exchange of messages and parameters between the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform.

Specifically, the message exchange occurs as follows:

1 The originating UCS DMS-250 switch, the bridging switch in this scenario, receives a non-operator call and allows it to normally reoriginate. The switch allocates reorigination resources to the call. The switch then issues an Initial Address Message (IAM) and sends it to another UCS DMS-250 switch, the remote switch in this scenario. The IAM includes a standard Nature of Address and the IAM does not build a Generic Digits or Transit Network Selector parameter.

2 In response to the IAM from the bridging switch, the remote UCS DMS-250 switch sends another IAM to the services platform. Table 6-8 shows parameters in this IAM that affect RLT functionality.

Table 6-8
RLT parameters in the IAM

RLT parameter	Comments
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (refer to Chapter 5, "RLT call scenarios for ESP," for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

3 The services platform returns an Address Complete message (ACM) to the remote switch. The remote switch passes the ACM to the bridging switch.

4 When the services platform answers the call, the platform sends an Answer Message (ANM) to the remote switch. The remote switch formats and sends another ANM to the bridging switch. The ANM contains the REORIGINATION_TYPE field in the Operator Information parameter set to Boomerang Reorigination. The originating switch deallocates reorigination resources for the call. Table 6-9 shows parameters in this ANM that affect RLT functionality.

Table 6-9
RLT parameters in the ANM

RLT parameter	Comments
Operator Information	This parameter’s Reorigination Type field determines what type of reorigination, if any, switches can perform for the call In this scenario, this field is set to Boomerang Reorigination.

Note 1: The ANM includes a Call Reference or Operator Information parameter only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

Note 2: Only ESPs with proper programming return this parameter in ANMs.

5 The services platform identifies the called party, but does not make the call to that party. First, it initiates billing by sending a Facility Request (FAR) message to the remote switch. Table 6-10 shows parameters in this FAR message that affect RLT functionality.

Table 6-10
RLT parameters in the billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this message, this parameter contains a Start Billing Time value that the bridging switch uses.

6 The remote switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch.

7 The bridging switch also checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message’s Facility Indicator parameter. In this scenario, the indicator starts billing.

Note 1: In this example, the services platform, remote, and bridging switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message's Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the bridging switch and the remote switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

8 To acknowledge that it received and processed the FAR message, the bridging switch formats a Facility Accept (FAA) message and sends it to the remote switch, which passes it to the services platform. Table 6-11 shows parameters in this FAA message that affect RLT functionality.

Table 6-11
RLT parameters in the Billing FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this message, it contains the same Start Billing Time value that was in the FAR message.

9 The ESP initiates release link trunking, sending another FAR message to the remote switch. Table 6-12 shows parameters in this FAR message that affect RLT functionality.

Table 6-12
RLT parameters in the Redirect FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for Operator Redirect/Transfer value that the bridging switch uses.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.
Calling Party Number	The switches, except bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's merged CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's merged CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform provided. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match billing records on the services platform and bridging switches.

10 The remote switch passes the FAR to the bridging switch. Because the trunk connecting the bridging switch to the switch from which it originally received the call does not support RLT functionality, it reads the message's Facility Indicator and performs release link trunking. Using translations of the Called Party Number parameter, the bridging switch completes the call. The switch will allocate reorigination resources, enabling boomerang reorigination.

Note: If the Called Party Number parameter contains an N00 services number, the switch supports boomerang reorigination. Refer to Chapter 5, "RLT call scenarios for ESP," for a description of boomerang reorigination.

11 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the remote switch, which passes it to the services platform. Table 6-13 shows parameters in this FAA message that affect RLT functionality.

Table 6-13
RLT parameters in the Redirect FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the “Release Link for Operator Redirect/Transfer” value that was in the FAR message.

12 After bridging the call, the bridging switch formats a Release (REL) message and sends it to the remote switch. The REL message includes a Normal Clearing Cause Indicator parameter.

13 The remote switch sends another REL message to the services platform and releases the connection to the services platform and the corresponding trunks. It also sends a Release Complete (RLC) message back to the bridging switch to confirm the release. This RLC also includes a proper Cause Indicator parameter.

Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

14 The services platform also releases its connections and returns another RLC with a proper Cause Indicator to the remote switch to confirm the release. Table 6-14 shows the complete reorigination timeframe for this scenario.

Table 6-14
Reorigination timeframe

After origination to the receipt of ACM	Between the receipt of ACM and ANM	Between the receipt of ANM and bridging FAR	After bridging FAR to call takedown
The switch does not allow reorigination	The switch allows normal reorigination	The switch does not allow reorigination	The switch allows boomerang reorigination

No Reorigination in the REORIG_TYPE field in the ANM and the originating switch is the bridging switch

Figure 6-1 is a comprehensive message flow diagram for this scenario. It shows the sequence for the exchange of messages and parameters between the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform.

Specifically, the message exchange occurs as follows:

1 The originating switch, the bridging switch in this scenario, receives a non-operator call and allows it to normally reoriginate. The switch allocates reorigination resources to the call. The switch then issues an Initial Address Message (IAM) and sends it to another switch, the remote switch in this scenario. The IAM includes a standard Nature of Address and the IAM does not build a Generic Digits or Transit Network Selector parameter.

2 In response to the IAM from the bridging switch, the remote switch sends another IAM to the services platform. Table 6-15 shows parameters in this IAM that affect RLT functionality.

Table 6-15
RLT parameters in the IAM

RLT parameter	Comments
Transit Network Selector	This parameter’s Reorigination Call field identifies whether the call is a boomerang reorigination call (refer to Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (ENSR0002).

3 The services platform returns an Address Complete message (ACM) to the remote switch. The remote switch passes the ACM to the bridging switch.

4 When the services platform answers the call, the platform sends an Answer Message (ANM) to the remote switch. The remote switch formats and sends another ANM to the bridging switch. The ANM contains the REORIGINATION_TYPE field in the Operator Information parameter set to No Reorigination. This ANM instructs the originating switch to deallocate reorigination resources for the call. Table 6-16 shows parameters in this ANM that affect RLT functionality.

Table 6-16
RLT parameters in the ANM

RLT parameter	Comments
Operator Information	This parameter's Reorigination Type field determines what type of reorigination, if any, switches can perform for the call In this scenario, this field is set to No Reorigination.

Note 1: The ANM includes a Call Reference or Operator Information parameter only when the switch has the feature (URLT0002).

Note 2: Only ESPs with proper programming return this parameter in ANMs.

5 The services platform identifies the called party, but does not make the call to that party. First, it initiates billing by sending a Facility Request (FAR) message to the remote switch. Table 6-17 shows parameters in this FAR message that affect RLT functionality.

Table 6-17
RLT parameters in the billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this message, this parameter contains a Start Billing Time value that the bridging switch uses.

6 The remote switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch.

7 The bridging switch also checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. In this scenario, the indicator starts billing.

Note 1: In this example, the services platform, remote, and bridging switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a UCS DMS-250 switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message's Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the bridging switch and the remote switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

8 To acknowledge that it received and processed the FAR message, the bridging UCS DMS–250 switch formats a Facility Accept (FAA) message and sends it to the remote switch, which passes it to the services platform. Table 6-18 shows parameters in this FAA message that affect RLT functionality.

Table 6-18
RLT parameters in the Billing FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this message, it contains the same Start Billing Time value that was in the FAR message.

9 The services platform initiates release link trunking, sending another FAR message to the remote switch. Table 6-19 shows parameters in this FAR message that affect RLT functionality.

Table 6-19
RLT parameters in the Redirect FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for Operator Redirect/Transfer value that the bridging switch uses.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.
Calling Party Number	The switches, except bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's merged CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's merged CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform provided. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match billing records on the services platform and bridging switch.

10 The remote switch passes the FAR to the bridging switch. Because the trunk connecting the bridging switch to the switch from which it originally received the call does not support RLT functionality, it reads the message's Facility Indicator and performs release link trunking. Using translations of the Called Party Number parameter, the bridging switch completes the second leg of the call. The switch will not allow reorigination.

Note: If the Called Party Number parameter contains an N00 services number, the switch supports boomerang reorigination. Refer to Chapter 5, "RLT call scenarios for ESP," for a description of boomerang reorigination.

11 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the remote switch, which passes it to the services platform. Table 6-20 shows parameters in this FAA message that affect RLT functionality.

Table 6-20
RLT parameters in the Redirect FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the Release Link for Operator Redirect/Transfer value that was in the FAR message.

12 After bridging the call, the bridging switch formats a Release (REL) message and sends it to the remote switch. The REL message includes a Normal Clearing Cause Indicator parameter.

13 The remote switch sends another REL message to the services platform and releases the connection to the services platform and the corresponding trunks. It also sends a Release Complete (RLC) message back to the bridging switch to confirm the release. This RLC also includes a proper Cause Indicator parameter.

14 The services platform also releases its connections and returns another RLC with a proper Cause Indicator to the remote switch to confirm the release. Table 6-21 shows the complete reorigination timeframe for this scenario.

Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

Table 6-21
Reorigination timeframe

After origination to the receipt of ACM	Between the receipt of ACM and ANM	Between the receipt of ANM and bridging FAR	After bridging FAR to call takedown
The switch does not allow reorigination	The switch allows normal reorigination	The switch does not allow reorigination	The switch allows normal reorigination

Normal Reorigination in the REORIG_TYPE field in the ANM and the originating switch is different from the bridging switch

Figure 6-2 is a comprehensive message flow diagram for this scenario. It shows the sequence for the exchange of messages and parameters between the originating UCS DMS-250 switch, the bridging UCS DMS-250 switch, and the services platform, when the originating switch is different from the bridging switch and normal reorigination is enabled by the ANM.

Specifically, the message exchange occurs as follows:

1 The originating switch receives a non-operator call and allows it to normally reoriginate. The switch allocates reorigination resources to the call. The switch then issues an Initial Address Message (IAM) and sends it to another switch, the bridging switch in this scenario. The IAM includes a standard Nature of Address and the IAM does not build a Generic Digits or Transit Network Selector parameter.

   Note: The originating switch is not the bridging switch in this scenario.

2 In response to the IAM from the originating switch, the bridging UCS DMS-250 switch sends another IAM to the services platform. Table 6-22 shows parameters in this IAM that affect RLT functionality.

Table 6-22
RLT parameters in the IAM

RLT parameter	Comments
Transit Network Selector	This parameter’s Reorigination Call field identifies whether the call is a boomerang reorigination call (refer to Chapter 5, “RLT call scenarios for ESP,” for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

3 The services platform returns an Address Complete message (ACM) to the bridging switch. The remote switch passes the ACM to the originating switch.

4 When the services platform answers the call, the platform sends an Answer Message (ANM) to the bridging switch. The bridging switch formats and sends another ANM to the originating switch. The ANM contains the REORIGINATION_TYPE field in the Operator Information parameter set to Normal Reorigination. The reorigination resources then remain allocated for the call at the originating switch. Table 6-23 shows parameters in this ANM that affect RLT functionality.

Table 6-23
RLT parameters in the ANM

RLT parameter	Comments
Operator Information	This parameter's Reorigination Type field determines what type of reorigination, if any, the switches can perform for the call In this scenario, this field is set to Normal Reorigination.

Note 1: The ANM includes a Call Reference or Operator Information parameter only when the switch has the feature (URLT0002).

Note 2: Only ESPs with proper programming return this parameter in ANMs.

5 The services platform identifies the called party, but does not make the call to that party. First, it initiates billing by sending a Facility Request (FAR) message to the bridging switch. Table 6-24 shows parameters in this FAR message that affect RLT functionality.

Table 6-24
RLT parameters in the billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this message, this parameter contains a Start Billing Time value that the bridging switch uses.

6 The bridging switch checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. In this message, the indicator starts billing.

Note 1: In this example, the services platform, bridging, and originating switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a UCS DMS-250 switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message’s Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the remote and the originating switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

7 To acknowledge that it received and processed the FAR message, the bridging switch formats a Facility Accept (FAA) message and sends it to the services platform. Table 6-25 shows parameters in this FAA message that affect RLT functionality.

Table 6-25
RLT parameters in the Billing FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this message, it contains the same Start Billing Time value that was in the FAR message.

8 The services platform initiates release link trunking, sending another FAR message to the bridging switch. Table 6-26 shows parameters in this FAR message that affect RLT functionality.

Table 6-26
RLT parameters in the Redirect FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for Operator Redirect/Transfer value that the bridging switch uses.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.
Calling Party Number	The switches, except the bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's merged CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's merged CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform can provide. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match billing records on the services platform and the bridging switch.

9 Because the trunk connecting the bridging switch to the originating switch does not support RLT functionality, the bridging switch reads the message's Facility Indicator and performs release link trunking. Using translations of the Called Party Number parameter, the bridging switch completes the second leg of the call.

Note 1: The bridging FAR may contain new reorigination billing information. Since no new billing information is passed on to the originating switch, if reorigination occurs during the call, the old billing information stored in the originating switch is used to bill the reoriginated call.

10 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the services platform. Table 6-27 shows parameters in this FAA message that affect RLT functionality.

Table 6-27
RLT parameters in the Redirect FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the Release Link for Operator Redirect/Transfer value that was in the FAR message.

11 After bridging the call, the bridging switch formats a Release (REL) message, sends it to the services platform and releases the connection to the services platform and the corresponding trunks.

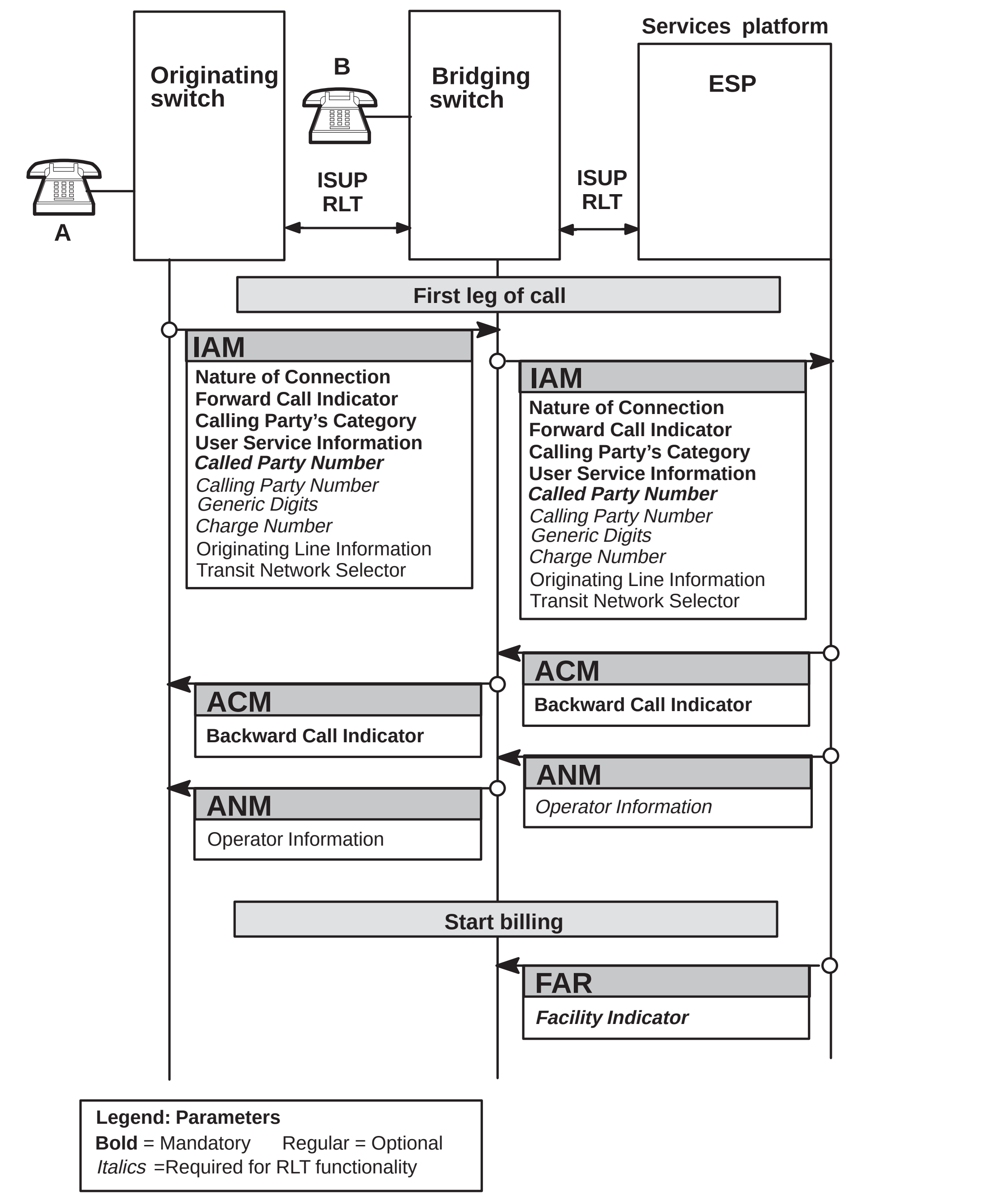
Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

12 The services platform also releases its connections and returns another RLC with a proper Cause Indicator to the bridging switch to confirm the release. Table 6-28 shows the complete reorigination timeframe for this scenario.

Table 6-28
Reorigination timeframe

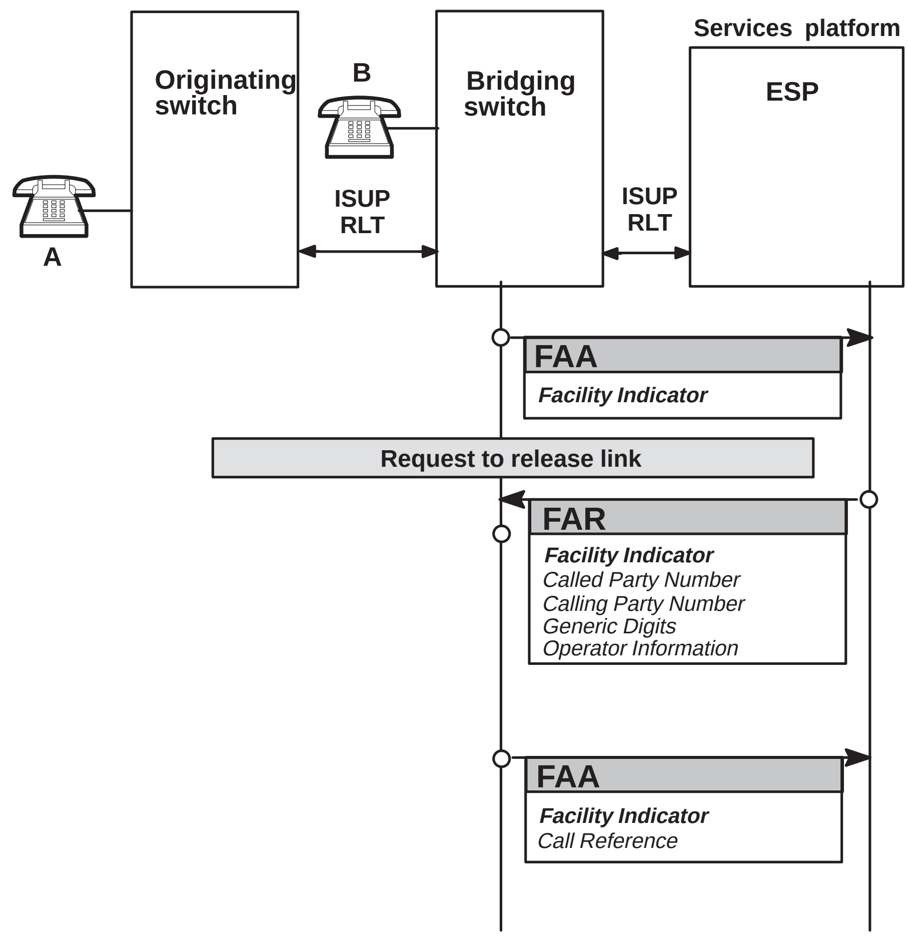
After origination to the receipt of ACM	Between the receipt of ACM and ANM	Between the receipt of ANM and bridging FAR	After bridging FAR to call takedown
The switch does not allow reorigination	The switch allows normal reorigination	The switch allows normal reorigination	The switch allows normal reorigination

Figure 6-2
Message flow for non-operator RLT call scenarios (originating switch not the bridging switch)



—continued—

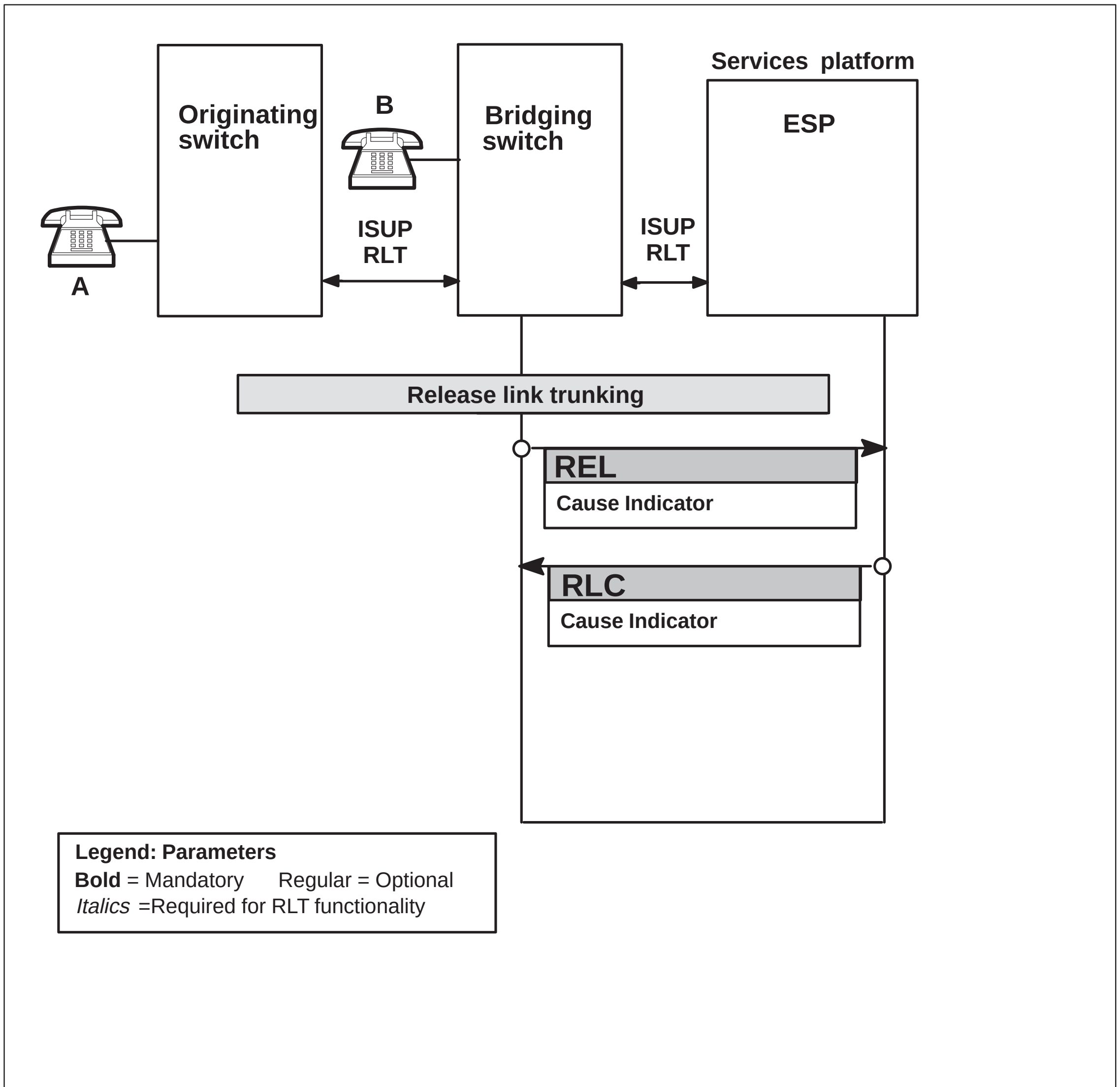
Figure 6-2
Message flow for non-operator RLT call scenarios (originating switch not bridging switch) (continued)



Legend: Parameters
Bold = Mandatory Regular = Optional
Italics =Required for RLT functionality

—continued—

Figure 6-2
Message flow for non-operator RLT call scenarios (originating switch not bridging switch) (continued)



—end—

Boomerang Reorigination in the REORIG_TYPE field in the ANM and the originating switch is different from the bridging switch

Figure 6-2 is a comprehensive message flow diagram for the scenario. It shows the sequence for the exchange of messages and parameters between the originating UCS DMS-250 switch, the bridging UCS DMS-250 switch, and the services platform. In these scenarios, we assume that the originating switch is different from the bridging switch and Boomerang reorigination is enabled by the ANM.

Specifically, the message exchange occurs as follows:

1 The originating switch receives a non-operator call and allows it to normally reoriginate. The switch allocates reorigination resources to the call. The switch then issues an Initial Address Message (IAM) and sends it to another switch, the bridging switch in this scenario. The IAM includes a standard Nature of Address and the IAM does not build a Generic Digits or Transit Network Selector parameter.

   Note: The originating switch is not the bridging switch in this scenario.

2 In response to the IAM from the originating switch, the bridging switch sends another IAM to the services platform. Table 6-29 shows parameters in this IAM that affect RLT functionality.

Table 6-29
RLT parameters in the IAM

RLT parameter	Comments
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (refer to Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (ENSR0002).

3 The services platform returns an Address Complete message (ACM) to the bridging switch. The bridging switch passes the ACM to the originating switch.

4 When the services platform answers the call, the platform sends an Answer Message (ANM) to the bridging switch. The bridging switch formats and sends another ANM to the originating switch. The ANM contains the REORIGINATION_TYPE field in the Operator Information parameter set to Boomerang Reorigination. The originating switch deallocates reorigination resources for the call. Table 6-30 shows parameters in this ANM that affect RLT functionality.

Table 6-30
RLT parameters in the ANM

RLT parameter	Comments
Operator Information	This parameter's Reorigination Type field determines what type of reorigination, if any, switches can perform for the call In this scenario, this field is set to Boomerang Reorigination.

Note 1: The ANM includes a Call Reference or Operator Information parameter only when the switch has the feature (URLT0002).

Note 2: Only ESPs with proper programming return this parameter in ANMs.

5 The services platform identifies the called party, but does not make the call to that party. First, it initiates billing by sending a Facility Request (FAR) message to the bridging switch. Table 6-31 shows parameters in this FAR message that affect RLT functionality.

Table 6-31
RLT parameters in the billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this message, this parameter contains a Start Billing Time value that the bridging switch uses.

6 The bridging switch checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. In this message, the indicator starts billing.

Note 1: In this example, the services platform, bridging, and remote switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a UCS DMS-250 switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message's Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the remote switch and the originating switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

7 To acknowledge that it received and processed the FAR message, the bridging switch formats a Facility Accept (FAA) message and sends it to the services platform. Table 6-32 shows parameters in this FAA message that affect RLT functionality.

Table 6-32
RLT parameters in the Billing FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the same Start Billing Time value that was in the FAR message.

8 The services platform initiates release link trunking, sending another FAR message to the bridging switch. Table 6-33 shows parameters in this FAR message that affect RLT functionality.

Table 6-33
RLT parameters in the Redirect FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for Operator Redirect/Transfer value that the bridging switch uses.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.
Calling Party Number	The switches, except the bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's merged CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's merged CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the that the services platform can provide. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match billing records on the services platform and bridging switch.

9. Because the trunk connecting the bridging switch to the switch from which it originally received the call does not support RLT functionality, it reads the message's Facility Indicator and performs release link trunking. Using translations of the Called Party Number parameter, the bridging switch completes the second leg of the call.
10. To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the services platform. Table 6-34 shows parameters in this FAA message that affect RLT functionality.

Table 6-34
RLT parameters in the Redirect FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the Release Link for Operator Redirect/Transfer value that was in the FAR message.

11 After bridging the call, the bridging switch formats a Release (REL) message, sends it to the services platform, and releases the connection to the services platform and the corresponding trunks.

Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

12 The services platform also releases its connections and returns another RLC with a proper Cause Indicator to the bridging switch to confirm the release. Table 6-35 shows the complete reorigination timeframe for this scenario.

Table 6-35
Reorigination timeframe

After origination to the receipt of ACM	Between the receipt of ACM and ANM	Between the receipt of ANM and bridging FAR	After bridging FAR to call takedown
The switch does not allow reorigination	The switch allows normal reorigination	The switch does not allow reorigination	The switch does not allow reorigination

No Reorigination in the REORIG_TYPE field in the ANM and the originating switch is different from the bridging switch

Figure 6-2 is a comprehensive message flow diagram for the scenario. It shows the sequence for the exchange of messages and parameters between the originating UCS DMS-250 switch, the bridging UCS DMS-250 switch, and the services platform. In this scenario, we assume the originating switch is different from the bridging switch and no reorigination is enabled by the ANM.

Specifically, the message exchange occurs as follows:

1 The originating switch receives a non-operator call and allows it to normally reoriginate. The switch allocates reorigination resources to the call. The switch then issues an Initial Address Message (IAM) and sends it to another switch, the bridging switch in this scenario. The IAM includes a standard Nature of Address and the IAM does not build a Generic Digits or Transit Network Selector parameter.

   Note: The originating switch is not the bridging switch in this scenario.

2 In response to the IAM from the originating switch, the bridging switch sends another IAM to the services platform. Table 6-36 shows parameters in this IAM that affect RLT functionality.

Table 6-36
RLT parameters in the IAM

RLT parameter	Comments
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (refer to Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (ENSR0002).

3 The services platform returns an Address Complete message (ACM) to the bridging switch. The bridging switch passes the ACM to the originating switch.

4 When the services platform answers the call, the platform sends an Answer Message (ANM) to the bridging switch. The bridging switch formats and sends another ANM to the originating switch. The ANM contains the REORIGINATION_TYPE field in the Operator Information parameter set to No Reorigination. This ANM instructs the originating switch to deallocate reorigination resources for the call. Table 6-37 shows parameters in this ANM that affect RLT functionality.

Table 6-37
RLT parameters in the ANM

RLT parameter	Comments
Operator Information	This parameter's Reorigination Type field determines what type of reorigination, if any, switches can perform for the call In this scenario, this field is set to No Reorigination.

Note 1: The ANM includes a Call Reference or Operator Information parameter only when the switch has the feature (URLT0002).

Note 2: Only ESPs with proper programming return this parameter in ANMs.

5 The services platform identifies the called party, but does not make the call to that party. First, it initiates billing by sending a Facility Request (FAR) message to the bridging switch. Table 6-38 shows parameters in this FAR message that affect RLT functionality.

Table 6-38
RLT parameters in the billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this message, this parameter contains a Start Billing Time value that the bridging switch uses.

6 The bridging switch checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. In this message, the indicator starts billing.

Note 1: In this example, the services platform, bridging, and originating switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message's Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the remote and the originating switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

7 To acknowledge that it received and processed the FAR message, the bridging switch formats a Facility Accept (FAA) message and sends it to the services platform. Table 6-39 shows parameters in this FAA message that affect RLT functionality.

Table 6-39
RLT parameters in the Billing FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this message, it contains the same Start Billing Time value that was in the FAR message.

8 The services platform initiates release link trunking, sending another FAR message to the bridging switch. Table 6-40 shows parameters in this FAR message that affect RLT functionality.

Table 6-40
RLT parameters in the Redirect FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for Operator Redirect/Transfer value that the bridging switch uses.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.
Calling Party Number	The switches, except bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's merged CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's merged CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the service platform can provide. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match billing records on the services platform and the bridging switch.

9 Because the trunk connecting the bridging switch to the switch from which it originally received the call does not support RLT functionality, it reads the message's Facility Indicator and performs release link trunking. Using translations of the Called Party Number parameter, the bridging switch completes the call.

10 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the services platform. Table 6-41 shows parameters in this FAA message that affect RLT functionality.

Table 6-41
RLT parameters in the Redirect FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the Release Link for Operator Redirect/Transfer value that was in the FAR message.

11 After bridging the call, the bridging switch formats a Release (REL) message, sends it to the services platform, and releases the connection to the services platform and the corresponding trunks.

Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

12 The services platform also releases its connections and returns another RLC with a proper Cause Indicator to the bridging switch to confirm the release. Table 6-42 shows the complete reorigination timeframe for this scenario.

Table 6-42
Reorigination timeframe

After origination to the receipt of ACM	Between the receipt of ACM and ANM	Between the receipt of ANM and bridging FAR	After bridging FAR to call takedown
The switch does not allow reorigination	The switch allows normal reorigination	The switch does not allow reorigination	The switch does not allow reorigination

Normal Reorigination in the REORIG_TYPE field in the ANM and the services platform does not allow bridging

Figure 6-3 is a comprehensive message flow diagram for this scenario. It shows the sequence for the exchange of messages and parameters between the originating UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform.

Specifically, the message exchange occurs as follows:

1 The originating switch receives a non-operator call and allows it to normally reoriginate. The switch allocates reorigination resources to the call. The switch then issues an Initial Address Message (IAM) and sends it to another switch, the remote switch in this scenario. The IAM includes a standard Nature of Address and the IAM does not build a Generic Digits or Transit Network Selector parameter.

   Note: The services platform does not allow bridging during this scenario.

2 In response to the IAM from the originating switch, the remote switch sends another IAM to the services platform. Table 6-43 shows parameters in this IAM that affect RLT functionality.

Table 6-43
RLT parameters in the IAM

RLT parameter	Comments
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (refer to Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

3 The services platform returns an Address Complete message (ACM) to the remote switch. The remote switch passes the ACM to the originating switch.

4 When the services platform answers the call, the platform sends an Answer Message (ANM) to the remote switch. The remote switch formats and sends another ANM to the originating switch. The ANM contains the REORIGINATION_TYPE field in the Operator Information parameter set to Normal Reorigination. The reorigination resources for the call remain allocated on the originating switch. Table 6-44 shows parameters in this ANM that affect RLT functionality.

Table 6-44
RLT parameters in the ANM

RLT parameter	Comments
Operator Information	This parameter’s Reorigination Type field determines what type of reorigination, if any, switches can perform for the call In this scenario, this field is set to No Reorigination.

Note 1: The ANM includes a Call Reference or Operator Information parameter only when the switch has the feature (URLT0002).

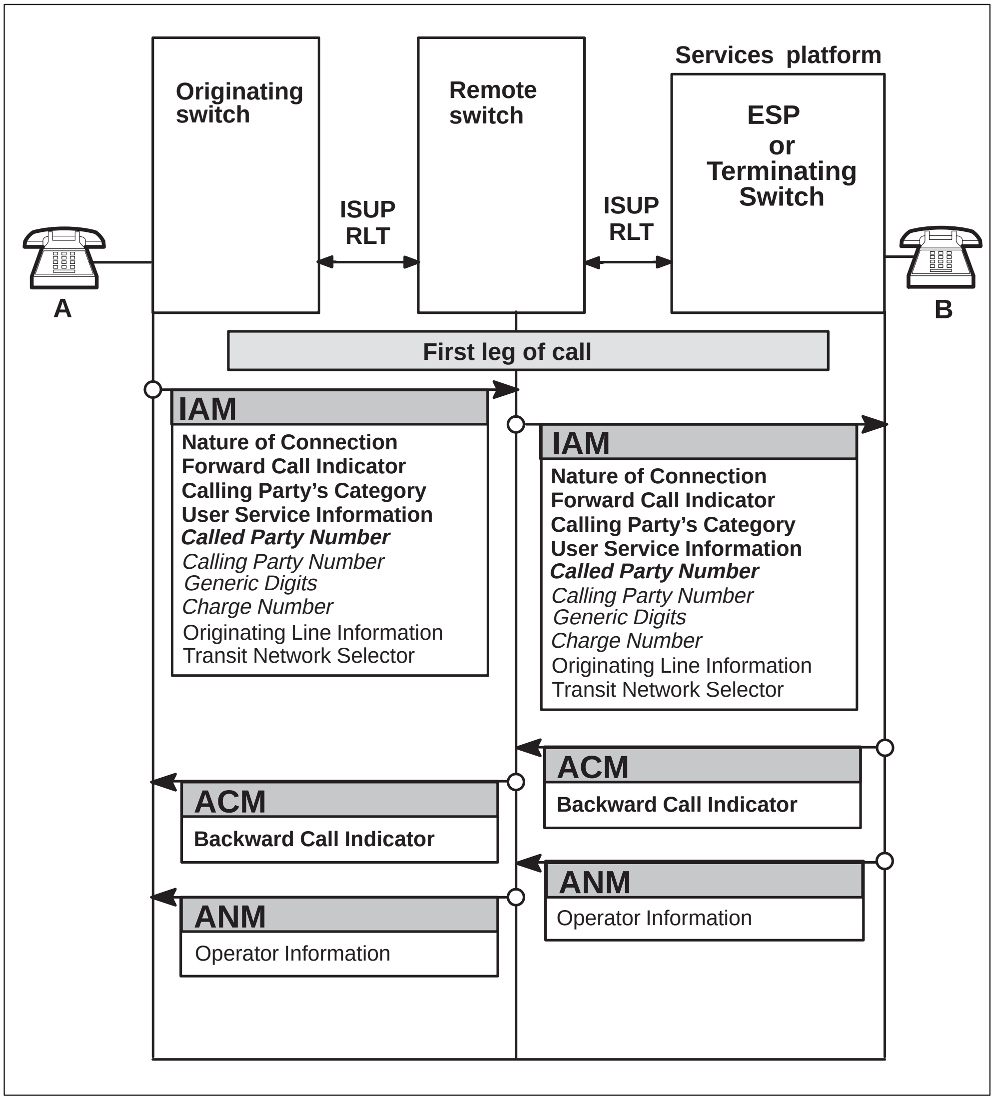
Note 2: Only ESPs with proper programming return this parameter in ANMs.

5 The services platform identifies the called party, and makes the call to that party. Table 6-45 shows the complete reorigination timeframe for this scenario.

Table 6-45
Reorigination timeframe

After origination to the receipt of ACM	Between the receipt of ACM and ANM	Between the receipt of ANM to call takedown
The switch does not allow reorigination	The switch allows normal reorigination	The switch allows normal reorigination

Figure 6-3
Message flow for non-operator RLT call scenarios (bridging not allowed)



Boomerang Reorigination in the REORIG_TYPE field in the ANM and the services platform does not allow bridging

Figure 6-3 is a comprehensive message flow diagram for the scenario. It shows the sequence for the exchange of messages and parameters between the originating UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform, when the services platform does not allow bridging.

Specifically, the message exchange occurs as follows:

1 The originating switch receives a non-operator call and allows it to normally reoriginate. The switch allocates reorigination resources to the call. The switch then issues an Initial Address Message (IAM) and sends it to another switch, the remote switch in this scenario. The IAM includes a standard Nature of Address and the IAM does not build a Generic Digits or Transit Network Selector parameter.

   Note: The services platform does not allow bridging in this scenario.

2 In response to the IAM from the originating switch, the remote switch sends another IAM to the services platform. Table 6-46 shows parameters in this IAM that affect RLT functionality.

Table 6-46
RLT parameters in the IAM

RLT parameter	Comments
Transit Network Selector	This parameter’s Reorigination Call field identifies whether the call is a boomerang reorigination call (refer to Chapter 5, “RLT call scenarios for ESP,” for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (ENSR0002).

3 The services platform returns an Address Complete message (ACM) to the remote switch. The remote switch passes the ACM to the originating switch.

4 When the services platform answers the call, the platform sends an Answer Message (ANM) to the remote switch. The remote switch formats and sends another ANM to the originating switch. The ANM contains the REORIGINATION_TYPE field in the Operator Information parameter set to Boomerang Origination or No Reorigination. This ANM instructs the originating switch to deallocate reorigination resources for the call. Table 6-47 shows parameters in this ANM that affect RLT functionality.

Table 6-47
RLT parameters in the ANM

RLT parameter	Comments
Operator Information	This parameter’s Reorigination Type field determines what type of reorigination, if any, switches can perform for the call In this message, this field is set to Boomerang or No Reorigination.

Note 1: The ANM includes a Call Reference or Operator Information parameter only when the switch has the feature (URLT0002).

Note 2: Only ESPs with proper programming return this parameter in ANMs.

5 The services platform identifies the called party, and makes the call to that party. Table 6-48 shows the complete reorigination timeframe for this scenario.

Table 6-48
Reorigination timeframe

After origination to the receipt of ACM	Between the receipt of ACM and ANM	Between the receipt of ANM to call takedown
The switch does not allow reorigination	The switch allows normal reorigination	The switch does not allow normal reorigination

Scenarios occurring when the originating switch does not allow normal reorigination at origination

The following scenarios can occur when the originating switch does not allow normal reorigination:

- Normal Reorigination in the REORIG_TYPE field in the ANM and the originating switch is the bridging switch
- Boomerang Reorigination in the REORIG_TYPE field in the ANM and the originating switch is the bridging switch
- No Reorigination in the REORIG_TYPE field in the ANM and the originating switch is the bridging switch
- Normal, Boomerang, or No Reorigination in the REORIG_TYPE field in the ANM and the originating switch is different from the bridging switch
- Normal Reorigination in the REORIG_TYPE field in the ANM and the the services platform does not allow bridging
- Boomerang or No Reorigination in the REORIG_TYPE field in the ANM and the the services platform does not allow bridging

Note: PRI trunks and ISUP IMTs do not support call reorigination.

Normal Reorigination in the REORIG_TYPE field in the ANM and the originating switch is the bridging switch

Figure 6-4 is a comprehensive message flow diagram for the scenario. It shows the sequence for the exchange of messages and parameters between the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform.

Specifically, the message exchange occurs as follows:

1 The originating switch, the bridging switch in this scenario, receives a non-operator call and does not allow it to normally reoriginate. The switch does not allocate reorigination resources to the call. The switch then issues an Initial Address Message (IAM) and sends it to another switch, the remote switch in this scenario. The IAM includes a standard Nature of Address and the IAM does not build a Generic Digits or Transit Network Selector parameter.

2 In response to the IAM from the bridging switch, the remote switch sends another IAM to the services platform. Table 6-49 shows parameters in this IAM that affect RLT functionality.

Table 6-49
RLT parameters in the IAM

RLT parameter	Comments
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (refer to Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

3 The services platform returns an Address Complete message (ACM) to the remote switch. The remote switch passes the ACM to the bridging switch.

4 When the services platform answers the call, the platform sends an Answer Message (ANM) to the remote switch. The remote switch formats and sends another ANM to the bridging switch. The ANM contains the REORIGINATION_TYPE field in the Operator Information parameter set to Normal Reorigination. This ANM instructs the originating switch to not allocate reorigination resources for the call. Table 6-50 shows parameters in this ANM that affect RLT functionality.

Table 6-50
RLT parameters in the ANM

RLT parameter	Comments
Operator Information	This parameter's Reorigination Type field determines what type of reorigination, if any, switches can perform for the call In this scenario, this field is set to Normal Reorigination.

Note 1: The ANM includes a Call Reference or Operator Information parameter only when the switch has the feature (URLT0002).

Note 2: Only ESPs with proper programming return this parameter in ANMs.

5 The services platform identifies the called party, but does not make the call to that party. First, it initiates billing by sending a Facility Request (FAR) message to the remote switch. Table 6-51 shows parameters in this FAR message that affect RLT functionality.

Table 6-51
RLT parameters in the billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this message, this parameter contains a Start Billing Time value that the bridging switch uses.

6 The remote switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch.

7 The bridging switch also checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. In this message, the indicator starts billing.

Note 1: In this example, the services platform, remote, and bridging switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message's Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the bridging switch and the remote switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

8 To acknowledge that it received and processed the FAR message, the bridging switch formats a Facility Accept (FAA) message and sends it to the remote switch, which passes it to the services platform. Table 6-52 shows parameters in this FAA message that affect RLT functionality.

Table 6-52
RLT parameters in the Billing FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this message, it contains the same Start Billing Time value that was in the FAR message.

9 The services platform initiates release link trunking, sending another FAR message to the remote switch. Table 6-53 shows parameters in this FAR message that affect RLT functionality.

Table 6-53
RLT parameters in the Redirect FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for Operator Redirect/Transfer value that the bridging switch uses.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.
Calling Party Number	The switches, except the bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's merged CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's merged CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform can provide. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match billing records on the services platform and bridging switch.

10 The remote switch passes the FAR to the bridging switch. Because the trunk connecting the bridging switch to the switch from which it originally received the call does not support RLT functionality, it reads the message's Facility Indicator and performs release link trunking. Using translations of the Called Party Number parameter, the bridging switch completes the call.

Note: If the Called Party Number parameter contains an N00 services number, the switch supports boomerang reorigination. Refer to Chapter 5, "RLT call scenarios for ESP," for a description of boomerang reorigination.

11 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the remote switch, which passes it to the services platform. Table 6-54 shows parameters in this FAA message that affect RLT functionality.

Table 6-54
RLT parameters in the Redirect FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the Release Link for Operator Redirect/Transfer value that was in the FAR message.

12 After bridging the call, the bridging switch formats a Release (REL) message and sends it to the remote switch. The REL message includes a Normal Clearing Cause Indicator parameter.

13 The remote switch sends another REL message to the services platform and releases the connection to the services platform and the corresponding trunks. It also sends a Release Complete (RLC) message back to the bridging switch to confirm the release. This RLC also includes a proper Cause Indicator parameter.

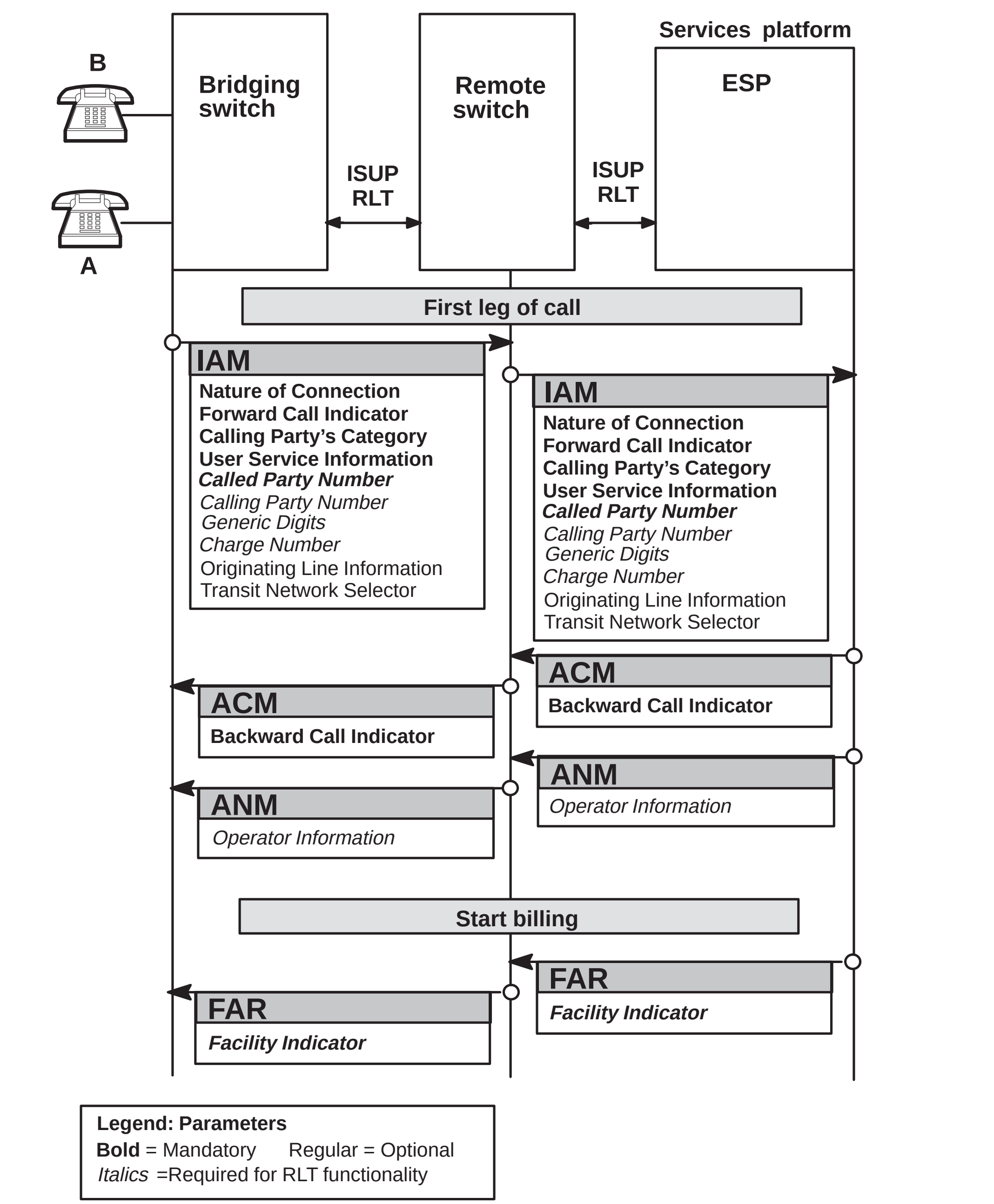
Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

14 The services platform also releases its connections and returns another RLC with a proper Cause Indicator to the remote switch to confirm the release. Table 6-55 shows the complete reorigination timeframe for this scenario.

Table 6-55
Reorigination timeframe

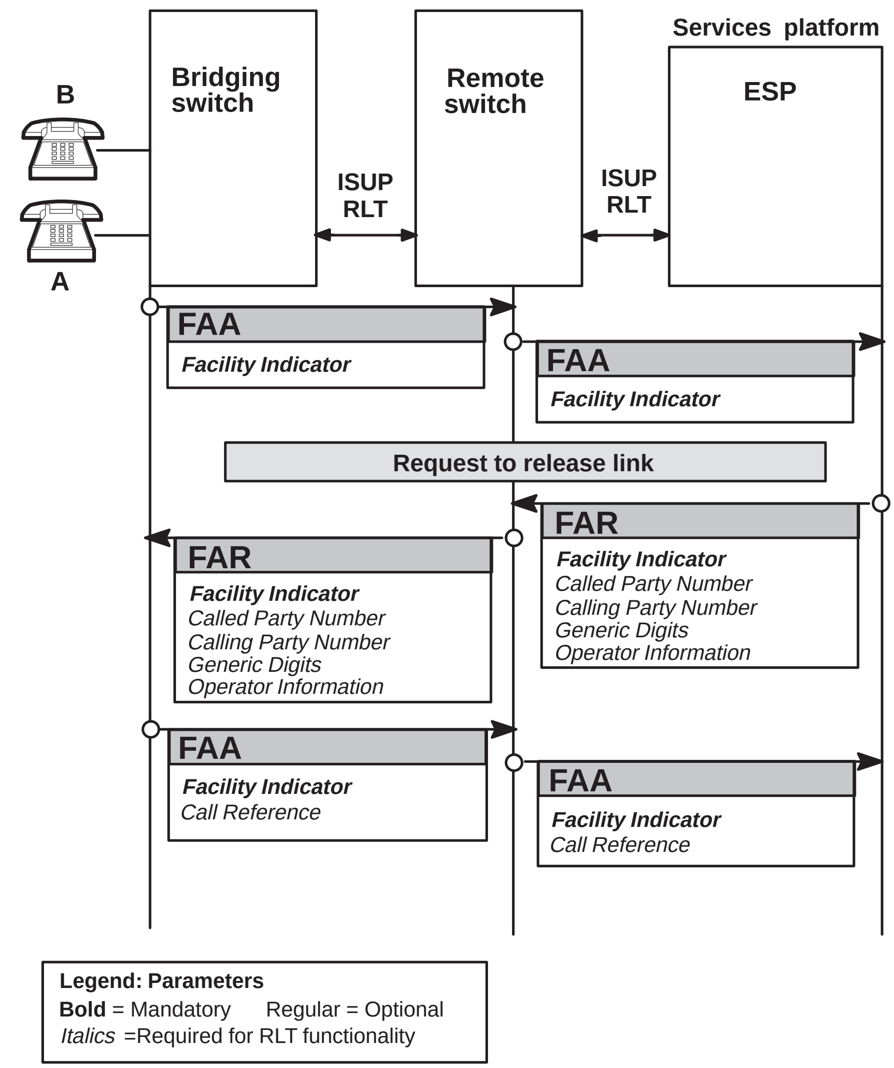
After origination to the receipt of ACM	Between the receipt of ACM and ANM	Between the receipt of ANM and bridging FAR	After bridging FAR to call takedown
The switch does not allow reorigination	The switch does not allow reorigination	The switch does not allow reorigination	The switch allows normal reorigination

Figure 6-4
Message flow for non-operator RLT call scenarios (originating switch is bridging switch and normal reorigination not allowed)



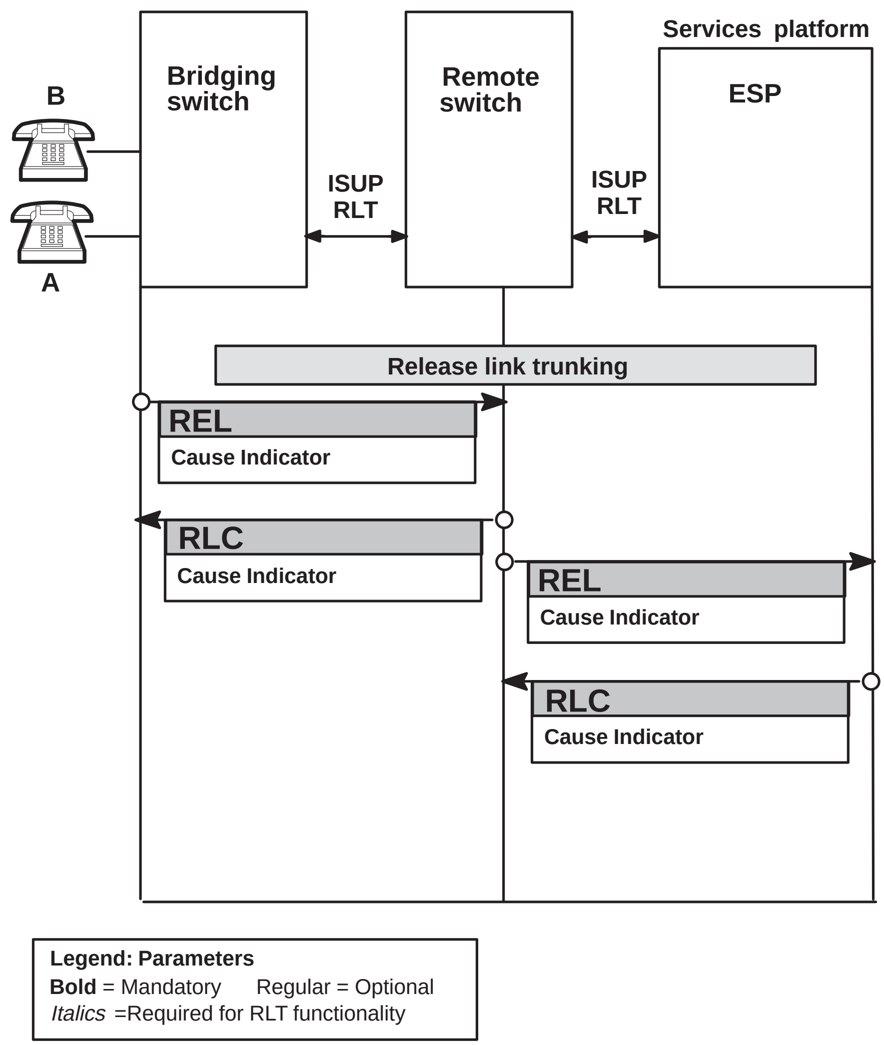
—continued—

Figure 6-4
Message flow for non-operator RLT call scenarios (originating switch is bridging switch and normal reorigination not allowed) (continued)



—continued—

Figure 6-4
Message flow for non-operator RLT call scenarios (originating switch is bridging switch and normal reorigination not allowed) **(**continued)



—end—

Boomerang Reorigination in the REORIG_TYPE field in the ANM and the originating switch is the bridging switch

Figure 6-4 is a comprehensive message flow diagram for this scenario. It shows the sequence for the exchange of messages and parameters between the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform.

Specifically, the message exchange occurs as follows:

1 The originating switch, the bridging switch in this scenario, receives a non-operator call and does not allow it to normally reoriginate. The switch does not allocate reorigination resources to the call. The switch then issues an Initial Address Message (IAM) and sends it to another switch, the remote switch in this scenario. The IAM includes a standard Nature of Address and the IAM does not build a Generic Digits or Transit Network Selector parameter.

2 In response to the IAM from the bridging switch, the remote switch sends another IAM to the services platform. Table 6-56 shows parameters in this IAM that affect RLT functionality.

Table 6-56
RLT parameters in the IAM

RLT parameter	Comments
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (refer to Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

3 The services platform returns an Address Complete message (ACM) to the remote switch. The remote switch passes the ACM to the bridging switch.

4 When the services platform answers the call, the platform sends an Answer Message (ANM) to the remote switch. The remote switch formats and sends another ANM to the bridging switch. The ANM contains the REORIGINATION_TYPE field in the Operator Information parameter set to Boomerang Reorigination. This ANM instructs the originating switch to not allocate reorigination resources for the call. Table 6-57 shows parameters in this ANM that affect RLT functionality.

Table 6-57
RLT parameters in the ANM

RLT parameter	Comments
Operator Information	This parameter's Reorigination Type field determines what type of reorigination, if any, switches can perform for the call In this scenario, this field is set to Boomerang Reorigination.

Note 1: The ANM includes a Call Reference or Operator Information parameter only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

Note 2: Only ESPs with proper programming return this parameter in ANMs.

5 The services platform identifies the called party, but does not make the call to that party. First, it initiates billing by sending a Facility Request (FAR) message to the remote switch. Table 6-58 shows parameters in this FAR message that affect RLT functionality.

Table 6-58
RLT parameters in the billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this message, this parameter contains a Start Billing Time value that the bridging switch uses.

6 The remote switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch.

7 The bridging switch also checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. In this message, the indicator starts billing.

Note 1: In this example, the services platform, remote, and bridging switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a UCS DMS-250 switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message's Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the bridging switch and the remote switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

8 To acknowledge that it received and processed the FAR message, the bridging switch formats a Facility Accept (FAA) message and sends it to the remote switch, which passes it to the services platform. Table 6-59 shows parameters in this FAA message that affect RLT functionality.

Table 6-59
RLT parameters in the Billing FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this message, it contains the same Start Billing Time value that was in the FAR message.

9 The services platform initiates release link trunking, sending another FAR message to the remote switch. Table 6-60 shows parameters in this FAR message that affect RLT functionality.

Table 6-60
RLT parameters in the Redirect FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for Operator Redirect/Transfer value that the bridging switch uses.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.
Calling Party Number	The switches, except bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's merged CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's merged CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform can provide. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match billing records on the services platform and bridging switch.

10 The remote switch passes the FAR to the bridging switch. Because the trunk connecting the bridging switch to the switch from which it originally received the call does not support RLT functionality, it reads the message's Facility Indicator and performs release link trunking. Using translations of the Called Party Number parameter, the bridging switch completes the call.

Note: If the Called Party Number parameter contains an N00 services number, the switch supports boomerang reorigination. Refer to Chapter 5, "RLT call scenarios for ESP," for a description of boomerang reorigination.

11 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the remote switch, which passes it to the services platform. Table 6-61 shows parameters in this FAA message that affect RLT functionality.

Table 6-61
RLT parameters in the Redirect FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the Release Link for Operator Redirect/Transfer value that was in the FAR message.

12 After bridging the call, the bridging switch formats a Release (REL) message and sends it to the remote switch. The REL message includes a Normal Clearing Cause Indicator parameter.

13 The remote switch sends another REL message to the services platform and releases the connection to the services platform and the corresponding trunks. It also sends a Release Complete (RLC) message back to the bridging switch to confirm the release. This RLC also includes a proper Cause Indicator parameter.

Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

14 The services platform also releases its connections and returns another RLC with a proper Cause Indicator to the remote switch to confirm the release. Table 6-62 shows the complete reorigination timeframe for this scenario.

Table 6-62
Reorigination timeframe

After origination to the receipt of ACM	Between the receipt of ACM and ANM	Between the receipt of ANM and bridging FAR	After bridging FAR to call takedown
The switch does not allow reorigination	The switch does not allow reorigination	The switch does not allow reorigination	The switch allows boomerang reorigination

No Reorigination in the REORIG_TYPE field in the ANM and the originating switch is the bridging switch

Figure 6-4 is a comprehensive message flow diagram for the scenario. It shows the sequence for the exchange of messages and parameters between the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform.

Specifically, the message exchange occurs as follows:

1 The originating switch, the bridging switch in this scenario, receives a non-operator call and does not allow it to normally reoriginate. The switch does not allocate reorigination resources to the call. The switch then issues an Initial Address Message (IAM) and sends it to another switch, the remote switch in this scenario. The IAM includes a standard Nature of Address and the IAM does not build a Generic Digits or Transit Network Selector parameter.

2 In response to the IAM from the bridging switch, the remote switch sends another IAM to the services platform. Table 6-63 shows parameters in this IAM that affect RLT functionality.

Table 6-63
RLT parameters in the IAM

RLT parameter	Comments
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (refer to Chapter 5, "RLT call scenarios for ESP," for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

3 The services platform returns an Address Complete message (ACM) to the remote switch. The remote switch passes the ACM to the bridging switch.

4 When the services platform answers the call, the platform sends an Answer Message (ANM) to the remote switch. The remote switch formats and sends another ANM to the bridging switch. The ANM contains the REORIGINATION_TYPE field in the Operator Information parameter set to Boomerang Reorigination. This ANM instructs the originating switch to deallocate reorigination resources for the call. Table 6-64 shows parameters in this ANM that affect RLT functionality.

Table 6-64
RLT parameters in the ANM

RLT parameter	Comments
Operator Information	This parameter's Reorigination Type field determines what type of reorigination, if any, switches can perform for the call In this scenario, this field is set to Boomerang Reorigination.

Note 1: The ANM includes a Call Reference or Operator Information parameter only when the switch has the feature (URLT0002).

Note 2: Only ESPs with proper programming return this parameter in ANMs.

5 The services platform identifies the called party, but does not make the call to that party. First, it initiates billing by sending a Facility Request (FAR) message to the remote switch. Table 6-65 shows parameters in this FAR message that affect RLT functionality.

Table 6-65
RLT parameters in the billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Start Billing Time value that the bridging switch uses.

6 The remote switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch.

7 The bridging switch also checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. In this message, the indicator starts billing.

Note 1: In this example, the services platform, remote, and bridging switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a UCS DMS-250 connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message's Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the bridging switch and the remote switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

8 To acknowledge that it received and processed the FAR message, the bridging switch formats a Facility Accept (FAA) message and sends it to the remote switch, which passes it to the services platform. Table 6-66 shows parameters in this FAA message that affect RLT functionality.

Table 6-66
RLT parameters in the Billing FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this message, it contains the same Start Billing Time value that was in the FAR message.

9 The services platform initiates release link trunking, sending another FAR message to the remote switch. Table 6-67 shows parameters in this FAR message that affect RLT functionality.

Table 6-67
RLT parameters in the Redirect FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for Operator Redirect/Transfer value that the bridging switch uses.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.
Calling Party Number	The switches, except bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's merged CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's merged CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform can provide. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match billing records on the services platform and bridging switch.

10 The remote switch passes the FAR to the bridging switch. Because the trunk connecting the bridging switch to the switch from which it originally received the call does not support RLT functionality, it reads the message's Facility Indicator and performs release link trunking. Using translations of the Called Party Number parameter, the bridging switch completes the call.

Note: If the Called Party Number parameter contains an N00 services number, the switch supports boomerang reorigination. Refer to Chapter 5, "RLT call scenarios for ESP," for a description of boomerang reorigination.

11 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the remote switch, which passes it to the services platform. Table 6-68 shows parameters in this FAA message that affect RLT functionality.

Table 6-68
RLT parameters in the Redirect FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the Release Link for Operator Redirect/Transfer value that was in the FAR message.

12 After bridging the call, the bridging switch formats a Release (REL) message and sends it to the remote switch. The REL message includes a Normal Clearing Cause Indicator parameter.

13 The remote switch sends another REL message to the services platform and releases the connection to the services platform and the corresponding trunks. It also sends a Release Complete (RLC) message back to the bridging switch to confirm the release. This RLC also includes a proper Cause Indicator parameter.

Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

14 The services platform also releases its connections and returns another RLC with a proper Cause Indicator to the remote switch to confirm the release. Table 6-69 shows the complete reorigination timeframe for this scenario.

Table 6-69
Reorigination timeframe

After origination to the receipt of ACM	Between the receipt of ACM and ANM	Between the receipt of ANM and bridging FAR	After bridging FAR to call takedown
The switch does not allow reorigination	The switch does not allow reorigination	The switch does not allow reorigination	The switch does not allow reorigination

Normal, Boomerang, or No Reorigination in the REORIG_TYPE field in the ANM and the originating switch is different from the bridging switch

Figure 6-5 is a comprehensive message flow diagram for this scenario. It shows the sequence for the exchange of messages and parameters between the originating UCS DMS-250 switch, the bridging UCS DMS-250 switch, and the services platform. In this scenario, we assume that the originating switch is different from the bridging switch and the ANM enables normal, boomerang, or no origination.

Specifically, the message exchange occurs as follows:

1 The originating switch receives a non-operator call and does not allow it to normally reoriginate. The switch does not allocate reorigination resources to the call. The switch then issues an Initial Address Message (IAM) and sends it to another switch, the bridging switch in this scenario. The IAM includes a standard Nature of Address and the IAM does not build a Generic Digits or Transit Network Selector parameter.

   Note: The originating switch is not the bridging switch in this scenario.

2 In response to the IAM from the originating switch, the bridging switch sends another IAM to the services platform. Table 6-70 shows parameters in this IAM that affect RLT functionality.

Table 6-70
RLT parameters in the IAM

RLT parameter	Comments
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (refer to Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

3 The services platform returns an Address Complete message (ACM) to the bridging switch. The bridging switch passes the ACM to the originating switch.

4 When the services platform answers the call, the platform sends an Answer Message (ANM) to the bridging switch. The bridging switch formats and sends another ANM to the originating switch. The ANM contains the REORIGINATION_TYPE field in the Operator Information parameter set to Normal Reorigination, Boomerang Reorigination, or No Reorigination. This ANM instructs the originating switch on whether or not to allocate reorigination resources for the call. Table 6-71 shows parameters in this ANM that affect RLT functionality.

Table 6-71
RLT parameters in the ANM

RLT parameter	Comments
Operator Information	This parameter's Reorigination Type field determines what type of reorigination, if any, switches can perform for the call. In this case, this field is set to either Normal, Boomerang, or No Reorigination.

Note 1: The ANM includes a Call Reference or Operator Information parameter only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

Note 2: Only ESPs with proper programming return this parameter in ANMs.

5 The services platform identifies the called party, but does not make the call to that party. First, it initiates billing by sending a Facility Request (FAR) message to the bridging switch. Table 6-72 shows parameters in this FAR message that affect RLT functionality.

Table 6-72
RLT parameters in the billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Start Billing Time value that the bridging switch uses.

6 The bridging switch checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. In this message, the indicator starts billing.

Note 1: In this example, the services platform, bridging, and originating switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a UCS DMS-250 switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message's Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between a remote switch and the originating switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

7 To acknowledge that it received and processed the FAR message, the bridging switch formats a Facility Accept (FAA) message and sends it to the services platform. Table 6-73 shows parameters in this FAA message that affect RLT functionality.

Table 6-73
Important RLT parameters in this Billing FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the same Start Billing Time value that was in the FAR message.

8 The services platform initiates release link trunking, sending another FAR message to the bridging switch. Table 6-74 shows parameters in this FAR message that affect RLT functionality.

Table 6-74
RLT parameters in the Redirect FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a “Release Link for Operator Redirect/Transfer” value that the bridging switch uses.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.
Calling Party Number	The switches, except the bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call’s merged CDR and includes it in the call’s OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call’s merged CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform can provide. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match billing records on the services platform and bridging switch.

9 Because the trunk connecting the bridging switch to the switch from which it originally received the call does not support RLT functionality, it reads the message’s Facility Indicator and performs release link trunking. Using translations of the Called Party Number parameter, the bridging switch completes the call.

Note: If the Called Party Number parameter contains an N00 services number, the switch supports boomerang reorigination. Refer to Chapter 5, “RLT call scenarios for ESP,” for a description of boomerang reorigination.

10 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the services platform. Table 6-75 shows parameters in this FAA message that affect RLT functionality.

Table 6-75
Important RLT parameters in this Redirect FAA message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requested at the bridging or remote switch. In this scenario, it contains the “Release Link for Operator Redirect/Transfer” value that was in the FAR message.

11 After bridging the call, the bridging switch formats a Release (REL) message, sends it to the services platform and releases the connection to the services platform and the corresponding trunks.

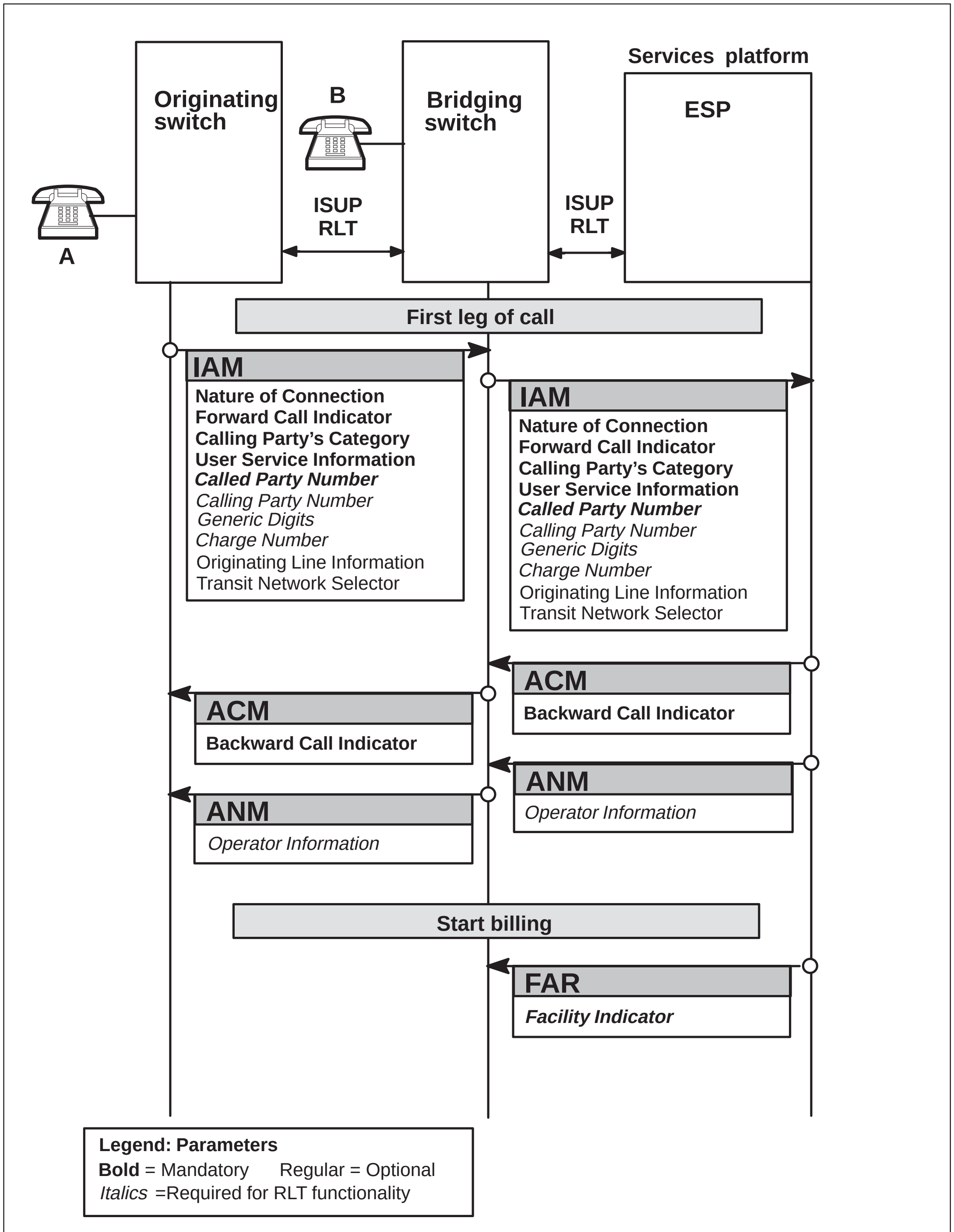
Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

12 The services platform also releases its connections and returns a RLC with a proper Cause Indicator to the bridging switch to confirm the release. Table 6-76 shows the complete reorigination timeframe for this scenario.

Table 6-76
Reorigination timeframe

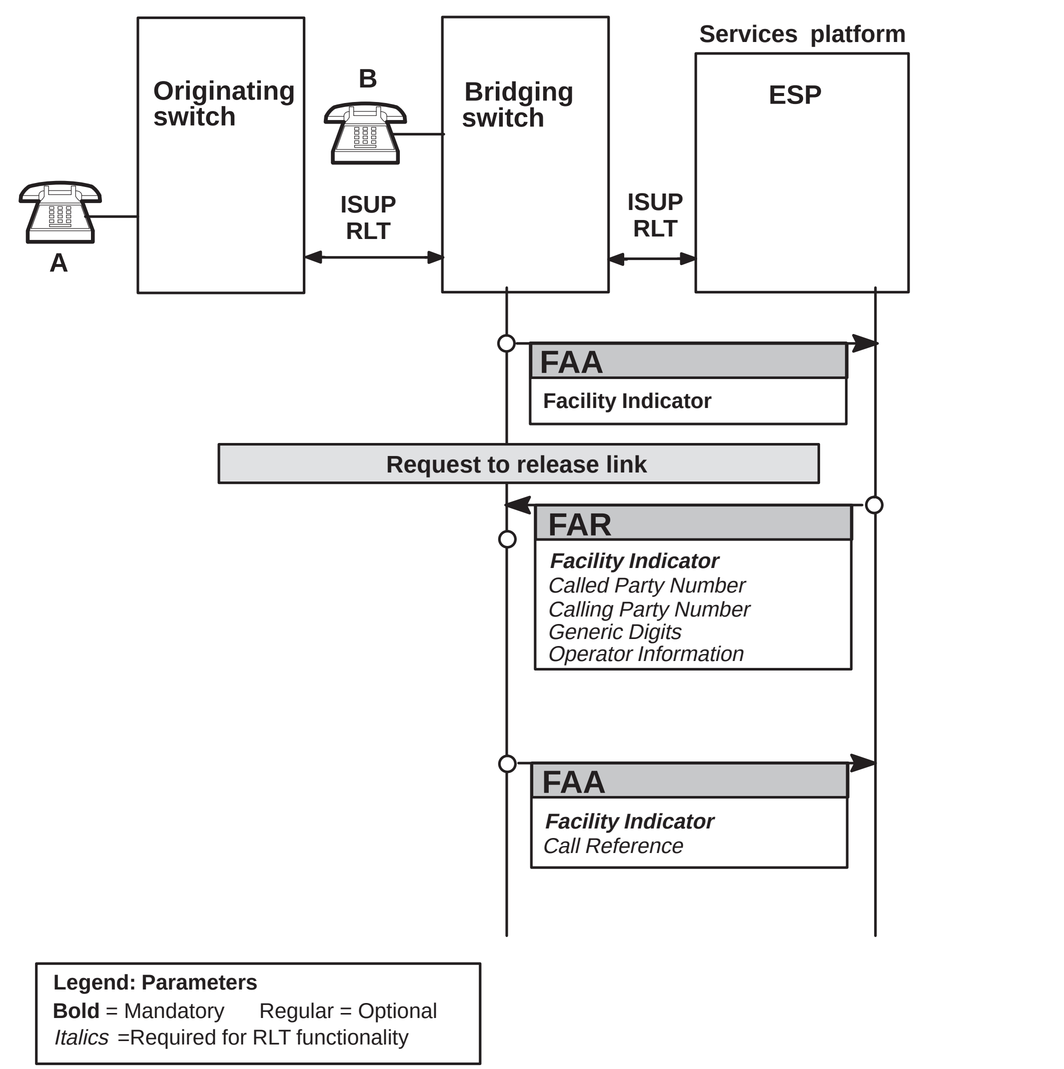
After origination to the receipt of ACM	Between the receipt of ACM and ANM	Between the receipt of ANM and bridging FAR	After bridging FAR to call takedown
The switch does not allow reorigination	The switch does not allow reorigination	The switch does not allow reorigination	The switch does not allow reorigination

Figure 6-5
Message flow for non-operator RLT call scenarios (originating switch not bridging switch



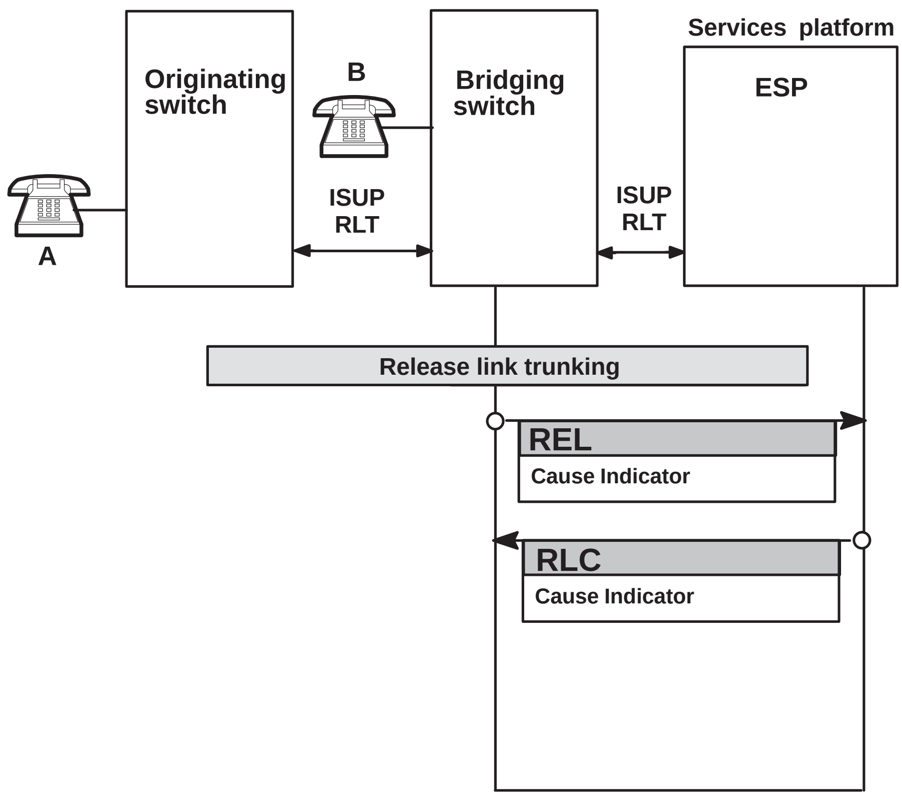
—continued—

Figure 6-5
Message flow for non-operator RLT call scenarios (originating switch is not bridging switch and) (continued)



—continued—

Figure 6-5
Message flow for non-operator RLT call scenarios (originating switch is not bridging switch and)
(continued)



Legend: Parameters
Bold = Mandatory Regular = Optional
Italics =Required for RLT functionality

—end—

Normal Reorigination in the REORIG_TYPE field in the ANM and the services platform does not allow bridging

Figure 6-6 is a comprehensive message flow diagram for this scenario. It shows the sequence for the exchange of messages and parameters between the originating UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform. In this scenario, we assume that the services platform does not allow bridging, and normal reorigination is enabled by the ANM.

Specifically, the message exchange occurs as follows:

1 The originating switch receives a non-operator call and does not allow it to normally reoriginate. The switch does not allocate reorigination resources to the call. The switch then issues an Initial Address Message (IAM) and sends it to another switch, the remote switch in this scenario. The IAM includes a standard Nature of Address and the IAM does not build a Generic Digits or Transit Network Selector parameter.

   Note: The services platform does not allow bridging during this scenario.

2 In response to the IAM from the originating switch, the remote switch sends another IAM to the services platform. Table 6-77 shows parameters in this IAM that affect RLT functionality.

Table 6-77
RLT parameters in the IAM

RLT parameter	Comments
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (refer to Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

3 The services platform returns an Address Complete message (ACM) to the remote switch. The remote switch passes the ACM to the originating switch.

4 When the services platform answers the call, the platform sends an Answer Message (ANM) to the remote switch. The remote switch formats and sends another ANM to the originating switch. The ANM contains the REORIGINATION_TYPE field in the Operator Information parameter set to Normal Reorigination. This ANM instructs the originating switch to deallocate reorigination resources for the call. Table 6-78 shows parameters in this ANM that affect RLT functionality.

Table 6-78
RLT parameters in the ANM

RLT parameter	Comments
Operator Information	This parameter's Reorigination Type field determines what type of reorigination, if any, switches can perform for the call In this scenario, this field is set to Normal Reorigination.

Note 1: The ANM includes a Call Reference or Operator Information parameter only when the switch has the feature (URLT0002).

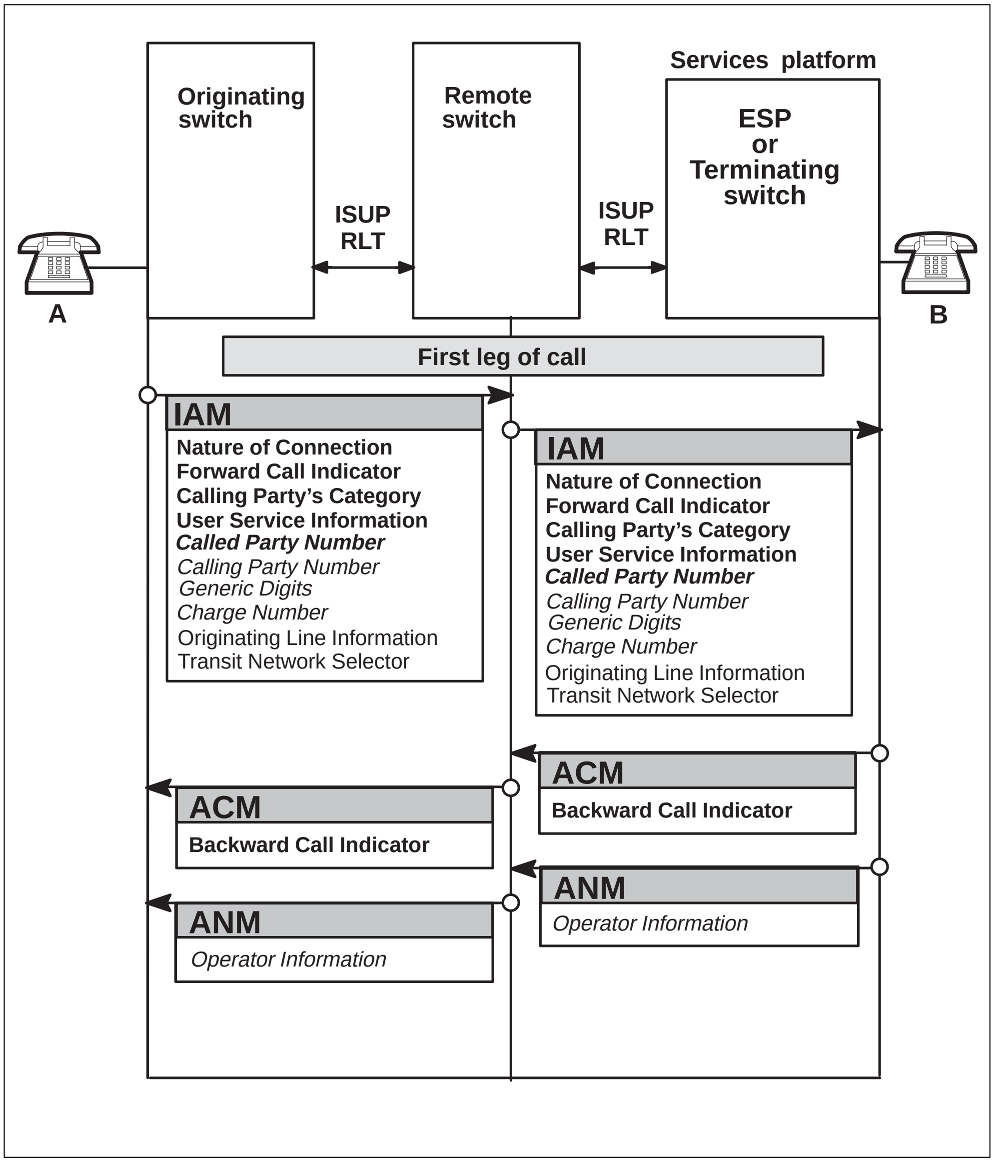
Note 2: Only ESPs with proper programming return this parameter in ANMs.

5 The services platform identifies the called party and makes the call to that party. Table 6-79 shows the complete reorigination timeframe for this scenario.

Table 6-79
Reorigination timeframe

After origination to the receipt of ACM	Between the receipt of ACM and ANM	Between the receipt of ANM to call takedown
The switch does not allow reorigination	The switch does not allow reorigination	The switch does not allow reorigination

Figure 6-6
Message flow for non-operator RLT call scenarios (bridging not allowed)



Boomerang or No Reorigination in the REORIG_TYPE field in the ANM and the services platform does not allow bridging

Figure 6-6 is a comprehensive message flow diagram for the scenario. It shows the sequence for the exchange of messages and parameters between the originating UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform. In this scenario, we assume the services platform does not allow bridging, and boomerang or no reorigination is enabled by the ANM.

Specifically, the message exchange occurs as follows:

1 The originating switch receives a non-operator call and does not allow it to normally reoriginate. The switch does not allocate reorigination resources to the call. The switch then issues an Initial Address Message (IAM) and sends it to another switch, the remote switch in this scenario. The IAM includes a standard Nature of Address and the IAM does not build a Generic Digits or Transit Network Selector parameter.

   Note: The services platform does not allow bridging in this scenario.

2 In response to the IAM from the originating switch, the remote switch sends another IAM to the services platform. Table 6-80 shows parameters in this IAM that affect RLT functionality.

Table 6-80
RLT parameters in the IAM

RLT parameter	Comments
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (refer to Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

3 The services platform returns an Address Complete message (ACM) to the remote switch. The remote switch passes the ACM to the originating switch.

4 When the services platform answers the call, the platform sends an Answer Message (ANM) to the remote switch. The remote switch formats and sends another ANM to the originating switch. The ANM contains the REORIGINATION_TYPE field in the Operator Information parameter set to Boomerang Reorigination or No Reorigination. This ANM instructs the originating switch to not allocate reorigination resources for the call. Table 6-81 shows parameters in this ANM that affect RLT functionality.

Table 6-81
RLT parameters in the ANM

RLT parameter	Comments
Operator Information	This parameter's Reorigination Type field determines what type of reorigination, if any, switches can perform for the call.

Note 1: The ANM includes a Call Reference or Operator Information parameter only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

Note 2: Only ESPs with proper programming return this parameter in ANMs.

5 The services platform identifies the called party and makes the call to that party. Table 6-82 shows a complete reorigination timeframe for this scenario.

Table 6-82
Reorigination timeframe

After origination to the receipt of ACM	Between the receipt of ACM and ANM	Between the receipt of ANM to call takedown
The switch does not allow reorigination	The switch allows normal reorigination	The switch does not allow normal reorigination

Billing for RLT calls

Using the Release Link Trunk (RLT) functionality, UCS DMS-250 switches can generate an operator service record (OSR), call detail record (CDR), or both for RLT calls. RLT functionality does not change the UCS DMS-250 switch's standard OSR or CDR.

The type of services platform, such as an Enhanced Services Provider (ESP) determines what billing records the switches produce. When an RLT call is complete, the bridging switch produces an OSR and CDR pair for calls to the services platform.

Note: The UCS12 software release does not support Enhanced Operator Position System (EOPS) functionality. The UCS software continues to support operator assisted calls through other platforms such as the ESP. Refer to Appendix A in the *UCS DMS-250 Feature Change Reference Guide* for additional information about EOPS removal.

RLT billing when services platform is an ESP

When the services platform is an ESP, the switches might or might not generate billing records; the nature of its billing records depends entirely on the ESP's specific implementation. Chapter 8 describes common RLT billing scenarios when the ESP overrides the UCS DMS-250 switches and populates certain fields in the CDR.

Office parameter for OSR generation

To generate an OSR, the configuration of any UCS DMS-250 bridging switch must include Operator recording units and UCS DMS-250 recording units. The NO_OF_EOPS_REC_UNITS office parameter in table OFCENG allocates the number of Operator recording units that a switch has available. When a switch that bridges an RLT call lacks Operator recording units, it generates an appropriate log report. Chapter 1, "RLT functionality," describes other office parameters that affect RLT billing.

Note: The originator of any RLT call receives the bill; the call's terminator does not.

Tables 7-1 and 7-2 provide examples of the OSR and CDR and the values that the records contain. The UCS12 software release does not support the RTELIST field. The UCS07 software release supports the RTELIST field

Table 7-1
UCS CDR fields at the bridging switch

Field name	Example	Value from first or second CDR
RECCD	F0	always F0 for CDR
DISCDATE	111	upon disconnect after bridge
CNPREDIG	0	first
ANSTYPE	00	second (first for redirect scenario)
PINDIGS		second, if available, otherwise first
ORIGTIME	15000	first
QUEUED	N	second (first for redirect scenario)
DISCTIME	15012	upon disconnect after bridge
TIMECHNG	N	second (first for redirect scenario)
ANISP		first
INFODIG		first
CALLDUR	12	second (first for redirect scenario if a hotel or motel) ***Note:*** Switches calculate the CALLDUR either as the time from the last Answer Message (ANM) to disconnect or as the time from the first ANM to disconnect. For calls with multiple ANMs, the remote switch produces a CDR with a CALLDUR value based on the time stamp for the last ANM. To set the switch to produce CDR with CALLDUR based on the first ANM that it receives from an ESP, set office parameter RLT_FIRST_ANM_BILLING to Y. Your switch and telecommunications network software determine which method the remote switch uses.
UNIVACC		first
COMPCODE	0	second (first for redirect scenario)

—continued—

Table 7-1
UCS CDR fields at the bridging switch (continued)

Field name	Example	Value from first or second CDR
DIALEDNO	2149974500	first
COLLTIME	002	second (first for redirect scenario)
CALLEDNO	2149974500	second (first for redirect scenario)
RTENO	00	second (first for redirect scenario)
PREDIG	0	second (first for redirect scenario)
OPART	511	first
ADIN		second (if not available, first for redirect scenario)
ORIGOPRT	511	second (if not available, first for redirect scenario)
SEQNUM	35796	second
ORIGDATE	111	first
FINSID		second
TRTMTCD	000	second
TPART	31	first
RTELIST	0007	second
ANISUFF		first
DISCTYPE	0	first
ORIGGRP	0392	first
ORIGMEM	0110	first
DIGDATA	N	second
TRAP	N	first
TERMGRP	0355	second
TERMEM	0111	second
COSOVE	N	first
FINTKGRP		second

—continued—

Table 7-1
UCS CDR fields at the bridging switch (continued)

Field name	Example	Value from first or second CDR
BILLNUM		first
ACCTCD		second, if available, otherwise first

—end—

Table 7-2
UCS OSR fields for OSR generated at the non-operator switch

Field name	Example	Message
RECCODE	F1	Facility Request (FAR) message: Called Party Number parameter
ENTCODE	27	FAR: Operator Information parameter
INFODIGS	00	upon disconnect
SERVFEAT	00	IAM: Originating Line Information parameter
		FAR: Originating Line Information parameter
CALLNGNO		FAR: Calling Party Number or CDR
CALLDNO	2149911212	FAR: Called Party Number or CDR
EVENTDIG	0	upon disconnect
STARTTME	002130353	FAR: Facility Indicator
		Note: The STARTTME field is the time when the called party answers. For unanswered calls, however, it is the time of the initial trunk seizure. When the call is answered while the operator is still connected to the call, STARTIME corresponds to answer time. When a switch bridges the call before it is answered, STARTTME is the initial trunk seizure time.
OPERNUMB	0002	FAR: Operator Information

—continued—

Table 7-2
UCS OSR fields for OSR generated at the non-operator switch (continued)

Field name	Example	Message
ELPSDTME	000002	upon disconnect ***Note:*** ELPSDTME is either the time from answer to disconnect or the start time (STARTTME) value received in the FAR to disconnect. To determine whether to use the answer time or the start time, switches use whichever they last received. If the call is not answered and the switches do not receive a start time, the ELPSDTME value is 0.
TRDIGS	00	default
CNOVTRCL		not used
EOPSINFO	0000	FAR
TEAMNUMB		not used
TRBLCODE		FAR: Operator Information
BILLCODE		not used
INDIC		FAR: Charge Adjust
BILLNUMB	6038020000	FAR: Charge Number
ADJTYPE		FAR: Charge Adjust
ROOMNUMB		FAR: Generic Digits
ADJENTRY		FAR: Charge Adjust
GUEST		FAR: Generic Digits
HOTELTAX		not used
QUOTEAMT		not used
ADJTIME		FAR: Charge Adjust
ADJAMT		FAR: Charge Adjust
SEQNUMB	00029	from CDR
WALKAWAY		not used
SSASCODE		not used
COIN	N	default
SWID	111	table OFCVAR ORIG_SWITCH_ID

—continued—

Table 7-2
UCS OSR fields for OSR generated at the non-operator switch (continued)

Field name	Example	Message
CNCREDIT		not used
SSASIND		not used
—end—		

Billing for different RLT call scenarios

This section shows how the UCS DMS-250 switches generate billing records for the following common call scenarios:

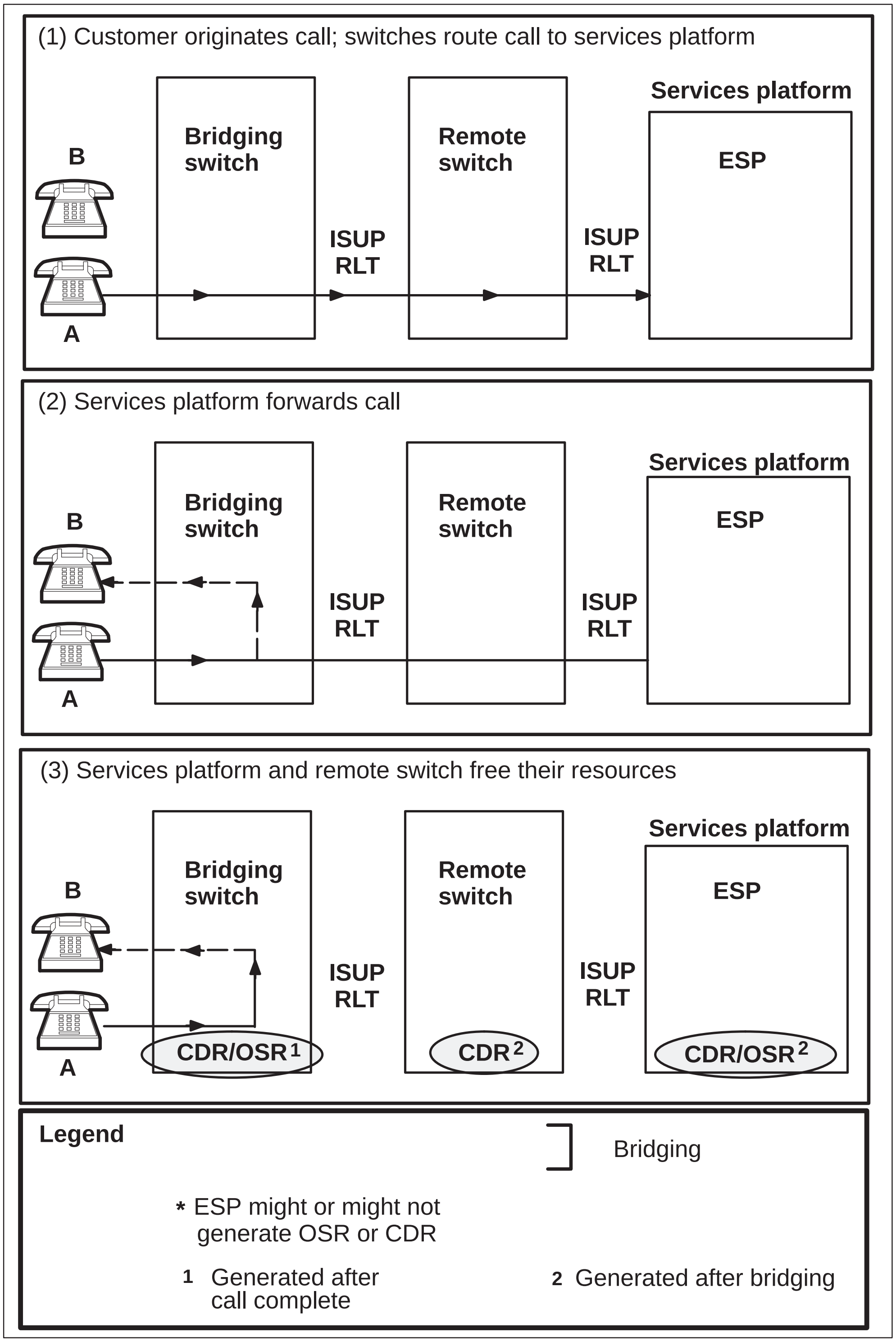
- ESP redirect and transfer scenario
- ESP redirect and transfer error scenario
- third-party interaction scenario
- third-party interaction error scenario
- ESP-initiated callback scenario

The following paragraphs describe the billing for these scenarios and provide diagrams that show the specific billing records that each switch provides.

Billing for ESP redirect and transfer scenario

For details on the redirect and transfer scenario, refer to Chapter 4, “Common RLT call scenarios.” In this scenario, the bridging switch generates one OSR and CDR pair. However the billing records that an ESP generates, if any, depend entirely on the ESP’s specific implementation. Each UCS DMS-250 switch other than the bridging switch produces only a CDR. Figure 7-1 shows the OSRs and CDRs that UCS DMS-250 switches generate for redirect and transfer calls.

Figure 7-1
Billing for ESP redirect and transfer



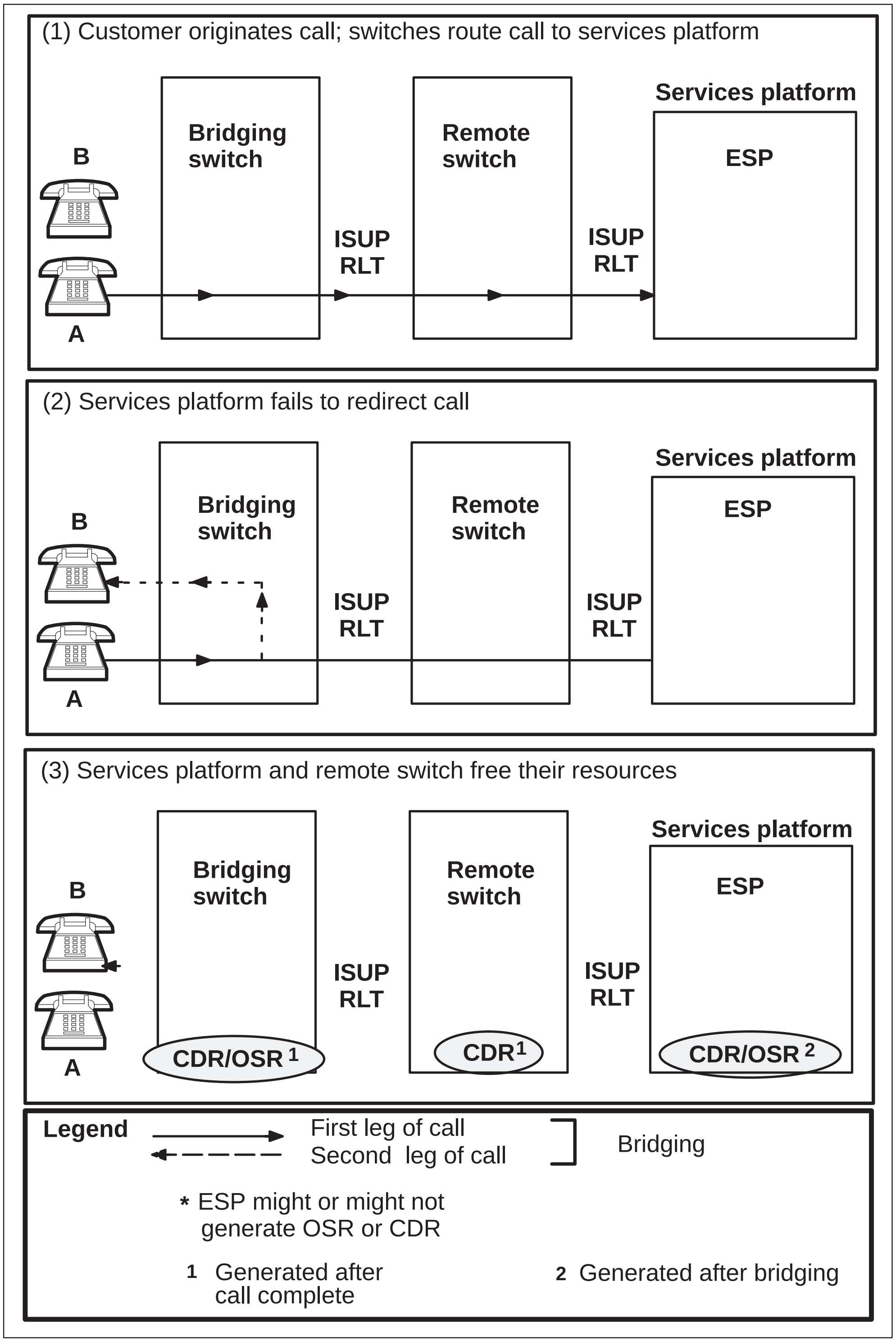
Billing for ESP redirect and transfer error scenario

For details on the redirect and transfer error scenario, refer to Chapter 4, "Common RLT call scenarios." In this scenario, the bridging switch generates one CDR for the call's first leg and another CDR for the second leg. Each UCS DMS-250 switch other than the bridging switch produces only a CDR.

Again, the billing records that an ESP generates, if any, depend entirely on the ESP's specific implementation.

Figure 7-2 shows the OSRs and CDRs that UCS DMS-250 switches generate for the redirect and transfer error scenario.

Figure 7-2
Billing for services platform redirect and transfer error scenario



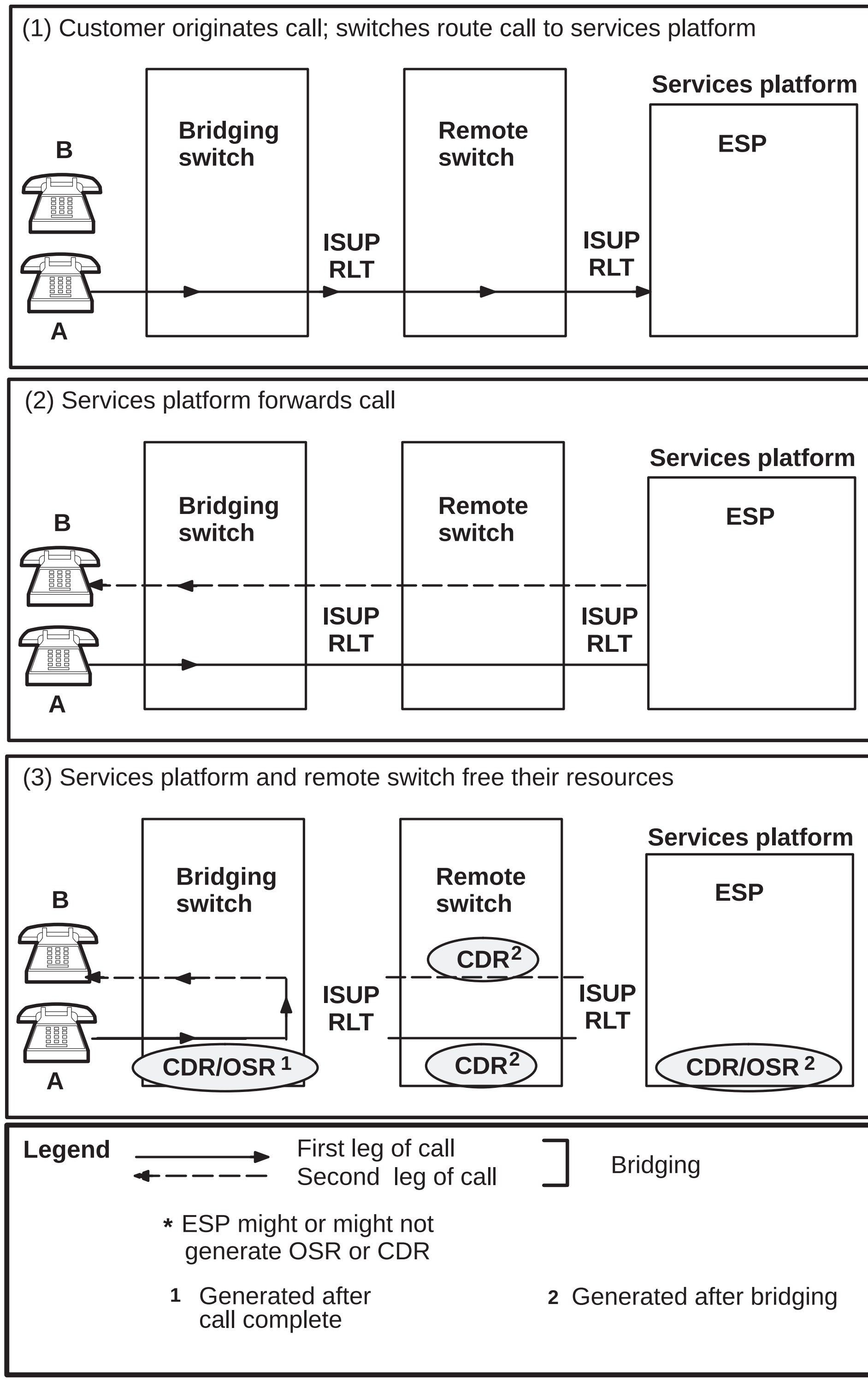
Billing for third-party interaction scenario

For details on the third-party interaction scenario, refer to Chapter 4, "Common RLT call scenarios." In this scenario, the bridging switch generates one OSR and CDR pair. Each UCS DMS-250 switch other than the bridging switch produces one CDR for the first leg of the call and another CDR for the second leg.

Again, the billing records that an ESP generates, if any, depend entirely on the ESP's specific implementation.

Figure 7-3 shows the OSRs and CDRs that UCS DMS-250 switches generate for the third-party interaction scenario.

Figure 7-3
Billing for third-party interaction scenario



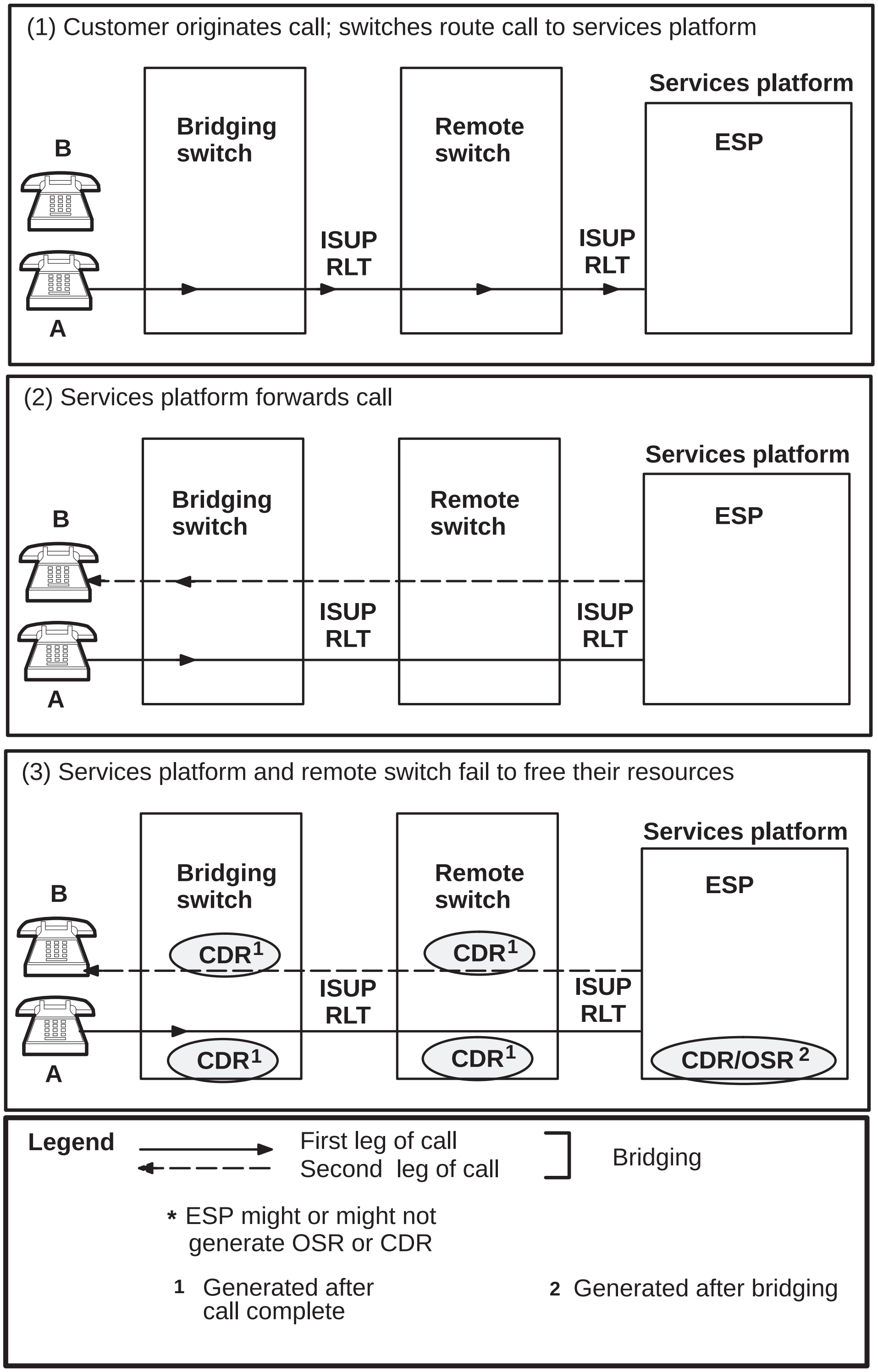
Billing for third-party interaction error scenario

For details on the third-party interaction error scenario, refer to Chapter 4, "Common RLT call scenarios." In this scenario, the bridging switch generates one CDR for the call's first leg and another CDR for the second leg. Each UCS DMS-250 switch other than the bridging switch produces one CDR for the first leg of the call and another CDR for the second leg.

Again, the billing records that an ESP generates, if any, depend entirely on the ESP's specific implementation.

Figure 7-4 shows the OSRs and CDRs that UCS DMS-250 switches generate for the third-party interaction scenario.

Figure 7-4
Billing for third–party interaction error scenario



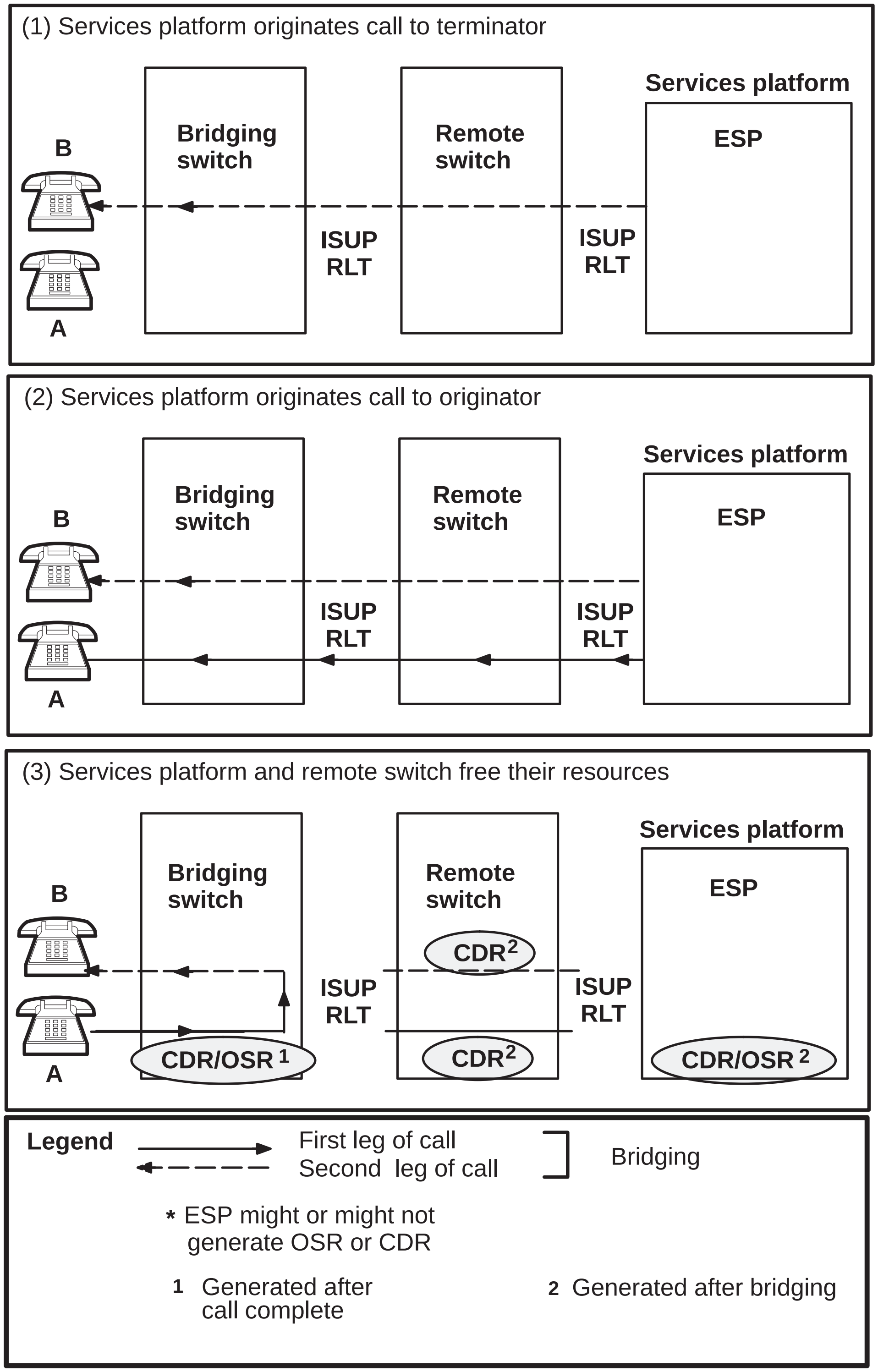
Billing for ESP-initiated callback scenario

For details on the ESP-initiated callback scenario, refer to Chapter 4, "Common RLT call scenarios." In this scenario, the bridging switch generates one OSR and CDR pair. Each UCS DMS-250 switch other than the bridging switch produces one CDR for the first leg of the call and another CDR for the call's second leg.

Again, the billing records that an ESP generates, if any, depend entirely on the ESP's specific implementation.

Figure 7-5 shows the OSRs and CDRs that UCS DMS-250 switches generate for the third-party interaction scenario.

Figure 7-5
Billing for ESP-initiated callback scenario



Billing for other RLT events

The following sections describe some of the other RLT events that can affect how the UCS DMS-250 switches generate billing records.

No bridging attempt

Sometimes, the call's originator can terminate a call before the services platform bridges the call. In such cases, the services platform generates the CDR and OSR pair. However, the billing records that an ESP generates, if any, depend entirely on the ESP's specific implementation.

Charge adjustment for bridged calls

When an operator adjusts the charge for an RLT call, the services platform generates a CDR and OSR pair and an additional OSR. The OSR and CDR pair contains complete call information. The other OSR contains charge adjustment information only. The bridging switch also generates an OSR and CDR pair. This OSR contains both charge adjust information and billing information.

Charge adjustment without bridging

Sometimes, an operator adjusts the charge for a call that the UCS DMS-250 switches do not bridge. In such cases, the services platform generates a CDR and OSR pair and an additional OSR. The OSR and CDR pair contains information about the call to the operator. The other OSR contains only charge adjustment information.

OSR formatter and packaging changes

Currently, all potential bridging switches with RLT functionality must have the current EOPS software installed. To allow elimination of this restriction in this release and future releases, one functional change and several software packaging changes affect current RLT functionality.

Note: The UCS12 software release does not support EOPS functionality. The UCS software continues to support operator assisted calls through other platforms such as the Enhanced Services Provider (ESP). Refer to Appendix A in the *UCS DMS-250 Feature Change Reference Guide* for additional information about EOPS removal.

The functional change involves the use of the table RESTAMA. The OSR formatter currently uses this table to modify the service feature digits. If a service feature digit is set to FIRM_RESTRICTED (7), the Charge Class Screening Code is used to index into table RESTAMA to obtain a new service feature digit. If table RESTAMA does not contain datafill, the switch sets the service feature digit to 0. The OSR formatter always generates a Service Feature digit of 0 if the original service feature digit is set to FIRM_RESTRICTED.

Common RLT billing scenarios

This chapter summarizes the flow of Signaling System 7 (SS7) Integrated Services Digital Network (ISDN) User Part (ISUP) messages between UCS DMS-250 switches and a services platform, such as an Enhanced Services Provider (ESP), that supports Release Link Trunk (RLT) capabilities. An ESP is a software system that provides specialized switching, billing, and call processing features.

This chapter describes common RLT billing scenarios for the ESP.

These scenarios describe how UCS DMS-250 switches allow an ESP to do the following:

- determine, on a per-call basis, whether billing duration (CALLDUR in the CDR) will begin with the first ANM or the last ANM
- populate CDR fields BILLNUM, UNIVACC, PINDIGS, and ACCTCD

External ANM billing control

As a default the UCS DMS-250 switch starts billing from the first ANM or last ANM, as determined by the value of the office parameter RLT_FIRST_ANM_BILLING in table OFCVAR. The UCS DMS-250 switch allows an ESP to override, on a per-call basis, this choice of first- or last-ANM billing using a FAR message. The UCS DMS-250 switch allows this override once for each call establishment or reorigination.

The first-/last-ANM billing indicator is optionally included as a field, ANM BILLING INDICATOR, in the Operator Information parameter.

The following FAR messages appear in this parameter:

- Bridging FAR
- Redirection FAR
- Start billing FAR
- Cancel billing FAR
- reorigination FAR

Populating billing fields

The UCS DMS-250 switch also allows the ESP to override/update the values to be recorded in the CDR fields BILLNUM, UNIVACC, PINDIGS, and ACCTCD using the FAR messages and IAMs sent by the ESP. The ESP may perform these overrides as many times as required before it releases the call. The messages supporting this ability are the following:

- IAM
- Bridging FAR
- Redirection FAR
- Start billing FAR
- Cancel billing FAR
- Reorigination FAR

Any or all of these parameters may appear in any one FAR message or IAM. A FAR message may additionally carry the ANM BILLING INDICATOR field in the Operator Information parameter.

Information received by the ESP during the course of a call may require update of the population of the CDR fields BILLNUM, UNIVACC, PINDIGS, and/or ACCTCD. Therefore, the UCS DMS-250 switch allows the ESP to take control of these billing actions remotely for calls made on RLT trunks.

Message flow summary

The ANM BILLING INDICATOR may be sent using a FAR message at any time up to and including the FAR causing redirection or bridging. An FAA message signals that all requests made in that FAR message succeeded; an FRJ message signals that the request to which its cause indicator applies did not succeed, and that no request in that FAR message of a lower priority succeeded. The UCS DMS-250 switch does no create a FAR with the first-/last-ANM billing indicator. It only propagates or processes such a FAR message received from the ESP.

The UCS DMS-250 switch allows multiple requests for actions to be made in a single FAR. Table 8-1 lists the priority of these requests for actions.

Table 8-1
Priority of FAR requests for action

Priority	Requests
1	override CDR field values
2	override RLT_FIRST_AMN_BILLING
3	primary, as specified by the facility indicator

When the UCS DMS-250 switch cannot satisfy all of the requests in a FAR message (except the override of CDR values), it returns an FRJ message containing a cause indicator. Because this FAR message contains requests for additional actions in a single FAR message, the switch could issue a FRJ message. This occurs for either of the following reasons:

- the primary request cannot be performed
- the first-/last-ANM override has already been performed (which is allowed only once per call)

If a request in a FAR message is rejected, the action it requested is not performed, nor is any other action of the same or lower priority. The switch does perform actions of a higher priority requested in the same FAR message.

The UCS DMS-250 switch uses possible cause indicator values to distinguish why it rejects certain FAR messages. Table 8-2 shows the priority of execution of requests in a single FAR message and the consequent return of the cause of failure.

Table 8-2
Priority of value assignment to FRJ cause indicator

Priority	Request	Cause
1	set first-/last-ANM billing	previous billing determination
2	primary request	primary request rejected

The default for each of the fields BILLNUM, UNIVACC, PINDIGS, and ACCTCD (that is, when the ESP does not send overriding values in an IAM or a FAR message) will be the value populated by the UCS DMS-250 in the ordinary course of call setup. The UCS DMS-250 switch performs overrides of these CDR field values, but their failure will not cause the switch to generate an FRJ message.

Billing scenarios

This section provides high-level diagrams and message flow diagrams for each of the common RLT call scenarios. Each message flow diagram illustrates the SS7 ISUP messaging between a bridging UCS DMS-250 switch, a remote UCS DMS-250 switch, and a services platform. The message flow diagrams highlight parameters that the ISUP messages contain. In respect to billing, ESP-initiated calls behave identically to bridged calls. Therefore, the additional message flows associated with ESP-initiation are not included in the diagrams. For technical descriptions of messages and parameters, see Chapter 3, “SS7 ISUP RLT messages and protocol.”

Note: As defined in previous chapters in this manual, the remote switch shown in the diagrams can also be the bridging switch under the proper conditions. For clarity, however, the bridging and remote switches in this chapter’s explanations are not the same switch. Even when the remote switch is the bridging switch, each scenario remains essentially the same.

The scenarios do not explain how a UCS DMS-250 switch generates billing records for each RLT call. For billing information, see Chapter 7, “Billing for RLT calls.”

The following RLT call scenarios are common to software the ESP:

- ESP redirect and transfer
- third-party interaction

ESP redirect and transfer scenario, message flow for bridged and redirected calls

In this scenario, the ESP at the services platform transfers the call to its destination and requests release link trunking. After the appropriate switch bridges the call, the release link trunking capability frees the services platform and the remote UCS DMS-250 switch.

Note: This scenario is identical to the section entitled "ESP redirect and transfer scenario, message flow for bridged and redirected calls" in Chapter 4, "Common RLT call scenarios."

Operator or ESP redirect and transfer error scenario, simple rejection and recovery

This section explains the message flow for the redirect and transfer scenario when, for whatever reason, a UCS DMS-250 switch cannot perform the action requested in the Facility Indicator parameter of a FAR message. In this case, the switch involved does not perform the action requested (such as release link trunking) and cannot complete the call. The switches must process the call using call treatment or other means.

Message flow for redirect and transfer error scenario

Figure 8-1 is a comprehensive message flow diagram for the redirect and transfer error scenario. It shows the sequence for the exchange of messages and parameters between the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform.

Specifically, the message exchange in this error scenario occurs as follows:

1 A switch, the bridging switch in this scenario, receives the call. Based on the nature of the call, the bridging switch formats an Initial Address Message (IAM) and sends it to another switch, the remote switch in this scenario.

2 In response to the IAM from the bridging switch, the remote switch sends another IAM to the services platform.

3 The services platform returns an Address Complete Message (ACM) to the remote switch. The ACM confirms that the services platform received the information needed to route the call to its destination. The remote switch passes the ACM to the bridging switch.

4 When either an ESP at the services platform answers the call, the platform sends an Answer Message (ANM) to the remote switch. The remote switch formats and sends another ANM to the bridging switch.

5 The services platform identifies the called party, but does not make the call to that party. First, it initiates billing by sending a Facility Request (FAR) message to the remote switch. Table 8-3 shows parameters in this FAR message that affect RLT functionality.

Table 8-3
RLT parameters in the billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Start Billing Time value that the bridging switch uses.

6 The remote switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch.

7 The bridging switch also checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message’s Facility Indicator parameter. In this scenario, the indicator starts billing.

Note 1: In this example, the services platform, remote, and bridging switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message’s Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the bridging switch and the remote switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

8 The bridging switch checks a new bridge/redirect FAR message from the services platform. The FAR contains the First ANM Billing Indicator field set to Last. This switch reads and performs the action designated in the FAR message’s Facility Indicator parameter.

9 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the remote switch, which passes it to the services platform. The FAR contains only bridging/redirection information.

10 The bridging switch checks a new bridge/redirect FAR message from the services platform. The FAR contains the Operator Information parameter that contains the first/last ANM Billing Indicator field set to first. This switch reads and tries to perform the action designated in the FAR message's Facility Indicator parameter.

11 The switch that attempted bridging returns a Facility Reject (FRJ) message to the remote switch to indicate that it could not perform the facility request. This message's Cause Indicator parameter contains a Previous Billing Determination value. In this scenario, the switch cannot perform the action because the first/last Billing Indicator can only be set to a new value once. In this scenario, because this request has a higher priority than the primary request, the switch does not execute the primary request and rejects the FAR.

12 The bridging switch checks a new bridge/redirect FAR message from the services platform. The FAR contains only bridging/redirection information. This switch reads and tries to perform the action designated in the FAR message's Facility Indicator parameter. In this scenario, the switch bridges the call.

13 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the remote switch, which passes it to the services platform. The FAR contains only bridging/redirection information.

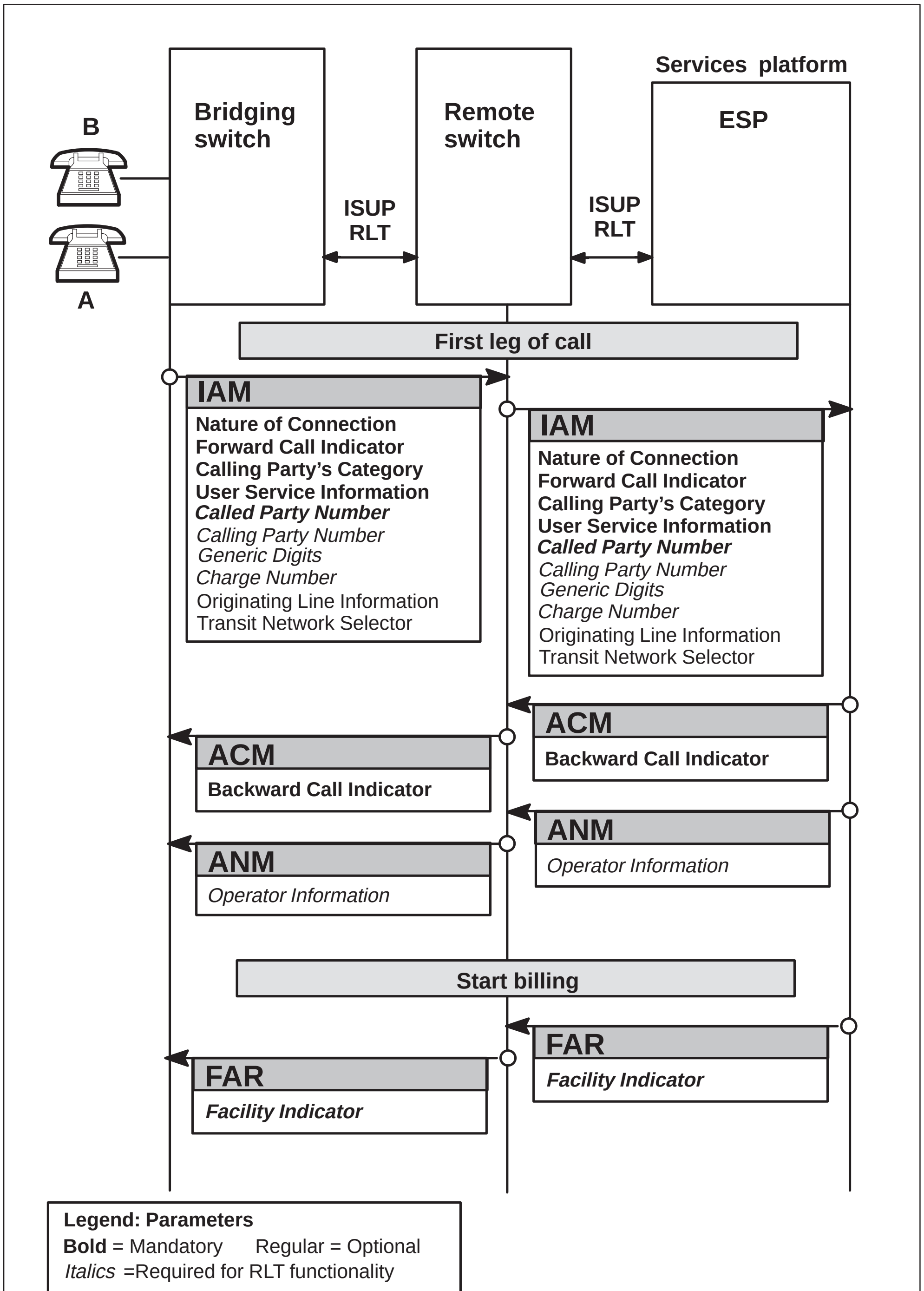
14 After bridging the call, the bridging switch formats a Release (REL) message and sends it to the remote switch. The REL message includes a Normal Clearing Cause Indicator parameter.

15 The remote switch sends another REL message to the services platform and releases the connection to the services platform and the corresponding trunks. It also sends a Release Complete (RLC) message back to the bridging switch to confirm the release. This RLC also includes a proper Cause Indicator parameter.

Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

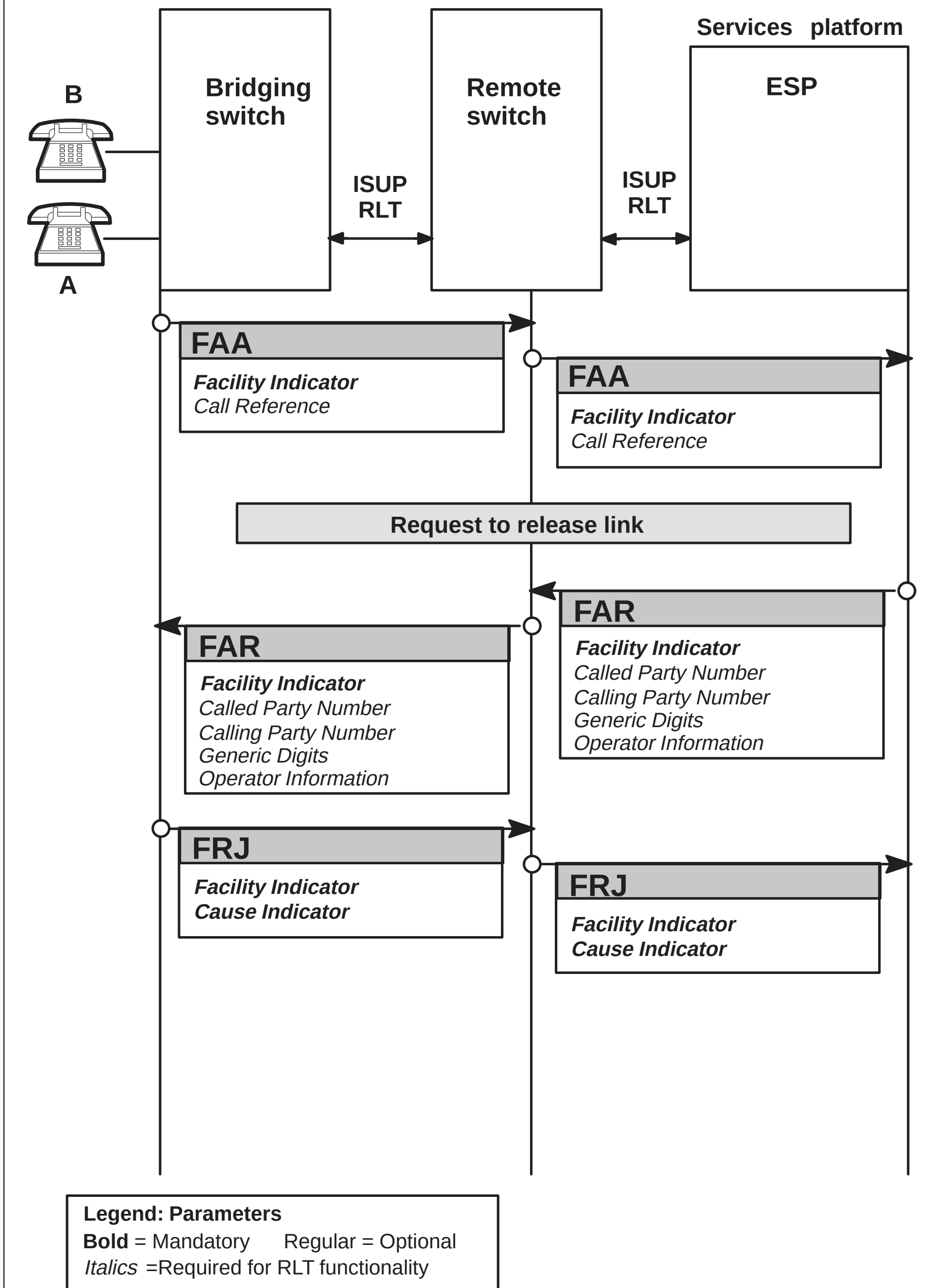
16 The services platform also releases its connections and returns another RLC with a proper Cause Indicator to the remote switch to confirm the release.

Figure 8-1
Message flow for redirect and transfer error scenario



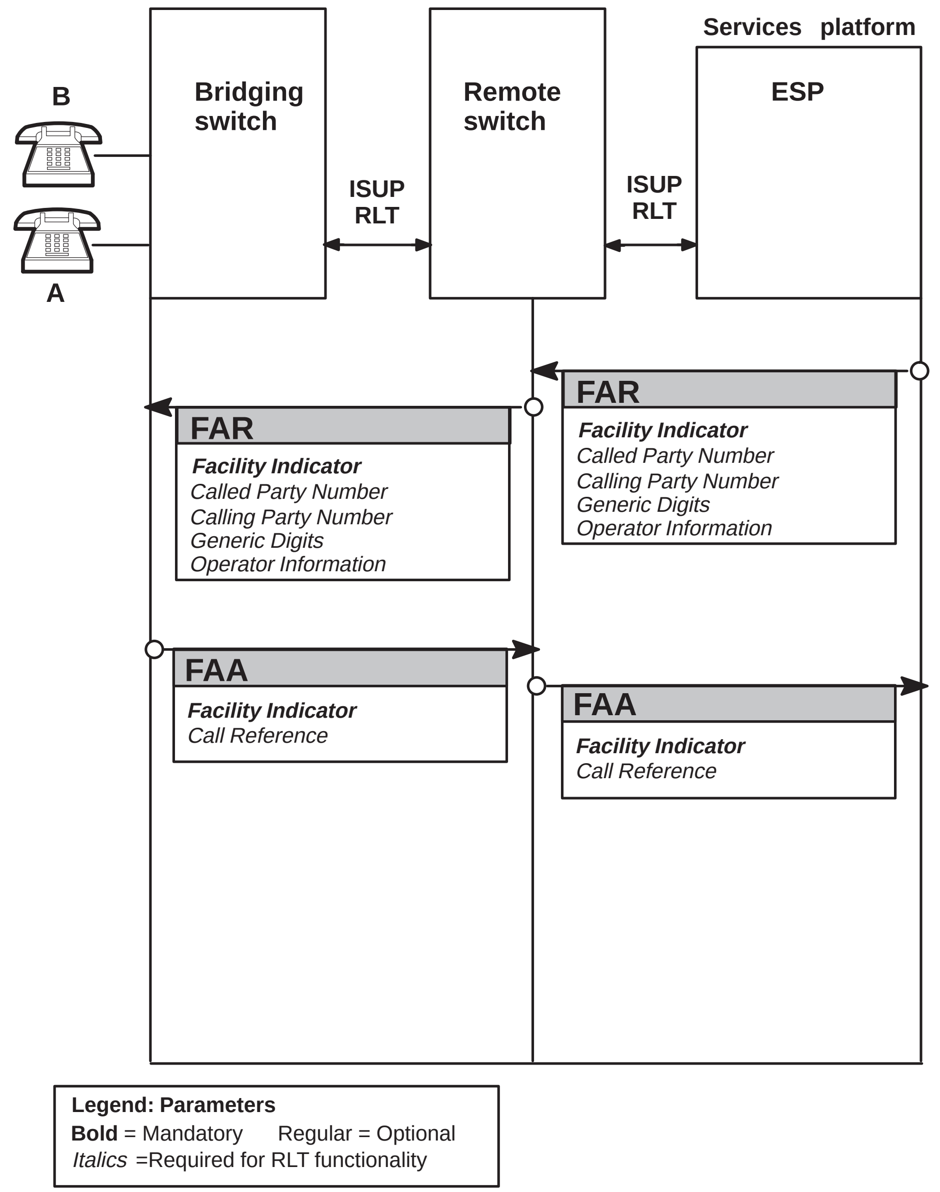
—continued—

Figure 8-1
Message flow for redirect and transfer error scenario (continued)



—continued—

Figure 8-1
Message flow for redirect and transfer error scenario (continued)



—end—

ESP redirect and transfer scenario, billing setup and update using a FAR message

In this scenario, the ESP at the services platform transfers the call to its destination and requests release link trunking. After the appropriate switch bridges the call, the release link trunking capability frees the services platform and the remote switch.

The trunks connecting the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and each services platform is an ISUP intermachine trunk (IMT) with RLT functionality. The trunk connecting the caller to the bridging switch is one of the following:

- a per-trunk signaling (PTS) trunk
- a primary rate interface (PRI) trunk
- an ISUP FGD trunk
- an ISUP IMT without RLT functionality

By definition, a switch only bridges a call when it cannot remove itself from the connection by passing the bridge request to another switch.

Note: PRI trunks and ISUP IMTs do not support call reorigination.

Message flow for redirect and transfer scenario

Figure 8-2 is a comprehensive message flow diagram for the redirect and transfer scenario. It shows the sequence for the exchange of messages and parameters between the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform.

Specifically, the message exchange occurs as follows:

1. A switch, the bridging switch in this scenario, receives the call. Based on the nature of the call, the bridging switch formats an Initial Address Message (IAM) and sends it to another switch, the remote switch in this scenario.

   Note: The CDR fields BILLNUM, UNIVACC, PINDIGS, and ACCTCD are initially populated by call setup.

2. In response to the IAM from the bridging switch, the remote switch sends another IAM to the services platform.
3. The services platform returns an Address Complete Message (ACM) to the remote switch. The ACM confirms that the services platform received the information needed to route the call to its destination. The remote switch passes the ACM to the bridging switch.

4 When the services platform answers the call, the platform sends an Answer Message (ANM) to the remote switch. The remote switch formats and sends another ANM to the bridging switch.

5 The services platform identifies the called party, but does not make the call to that party. First, it initiates billing by sending a Facility Request (FAR) message to the remote switch. Table 8-4 shows parameters in this FAR message that affect RLT functionality.

Table 8-4
RLT parameters in the billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Start Billing Time value that the bridging switch uses.
Generic Digits	This parameter contains values for the following fields: • BILLNUM, value from first FAR • UNIVACC, value from first FAR • PINDIGS, value from first FAR • ACCTCD, value from first FAR
Operator Information	Contains ANM Billing indicator set to either first or last.

6 The remote switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch.

7 The bridging switch also checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. In this scenario, the indicator starts billing.

Note 1: In this example, the services platform, remote, and bridging switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a UCS DMS-250 switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message's Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the bridging switch and the remote switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

8 To acknowledge that it received and processed the FAR message, the bridging switch formats a Facility Accept (FAA) message and sends it to the remote switch, which passes it to the services platform.

9 The services platform identifies the called party, but does not make the call to that party. It sends another Facility Request (FAR) message to the remote switch. Table 8-5 shows parameters in this FAR message that affect RLT functionality.

Table 8-5
RLT parameters in the billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Start Billing Time value that the bridging switch uses.
Generic Digits	This parameter contains values for the following fields: • BILLNUM, value from second FAR • UNIVACC, value from second FAR • PINDIGS, value from second FAR • ACCTCD, value from second FAR

10 The remote UCS DMS-250 switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch.

11 The bridging switch also checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. In this scenario, the indicator starts billing.

Note 1: In this example, the services platform, remote, and bridging switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message's Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the bridging switch and the remote switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

12 To acknowledge that it received and processed the FAR message, the bridging switch formats a Facility Accept (FAA) message and sends it to the remote switch, which passes it to the services platform.

13 The services platform initiates release link trunking, sending another FAR message to the remote switch. Table 8-6 shows parameters in this FAR message that affect RLT functionality.

Table 8-6
RLT parameters in the Redirect FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for Operator Redirect/Transfer value that the bridging switch uses.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call. This parameter also contains the first/last ANM billing indicator.
—continued—	

Table 8-6
RLT parameters in the Redirect FAR message (continued)

RLT parameter	Comments
Calling Party Number	The switches, except bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform provided. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match OSRs on both the services platform and bridging switches. This parameter contains values for the following fields: • BILLNUM, value from second FAR • UNIVACC, value from second FAR • PINDIGS, value from second FAR • ACCTCD, value from third FAR

—end—

14 The remote switch passes the FAR to the bridging switch. Because the trunk connecting the bridging switch to the switch from which it originally received the call does not support RLT functionality, it reads the message's Facility Indicator and performs release link trunking. Using translations of the Called Party Number parameter, the bridging switch completes the second leg of the call.

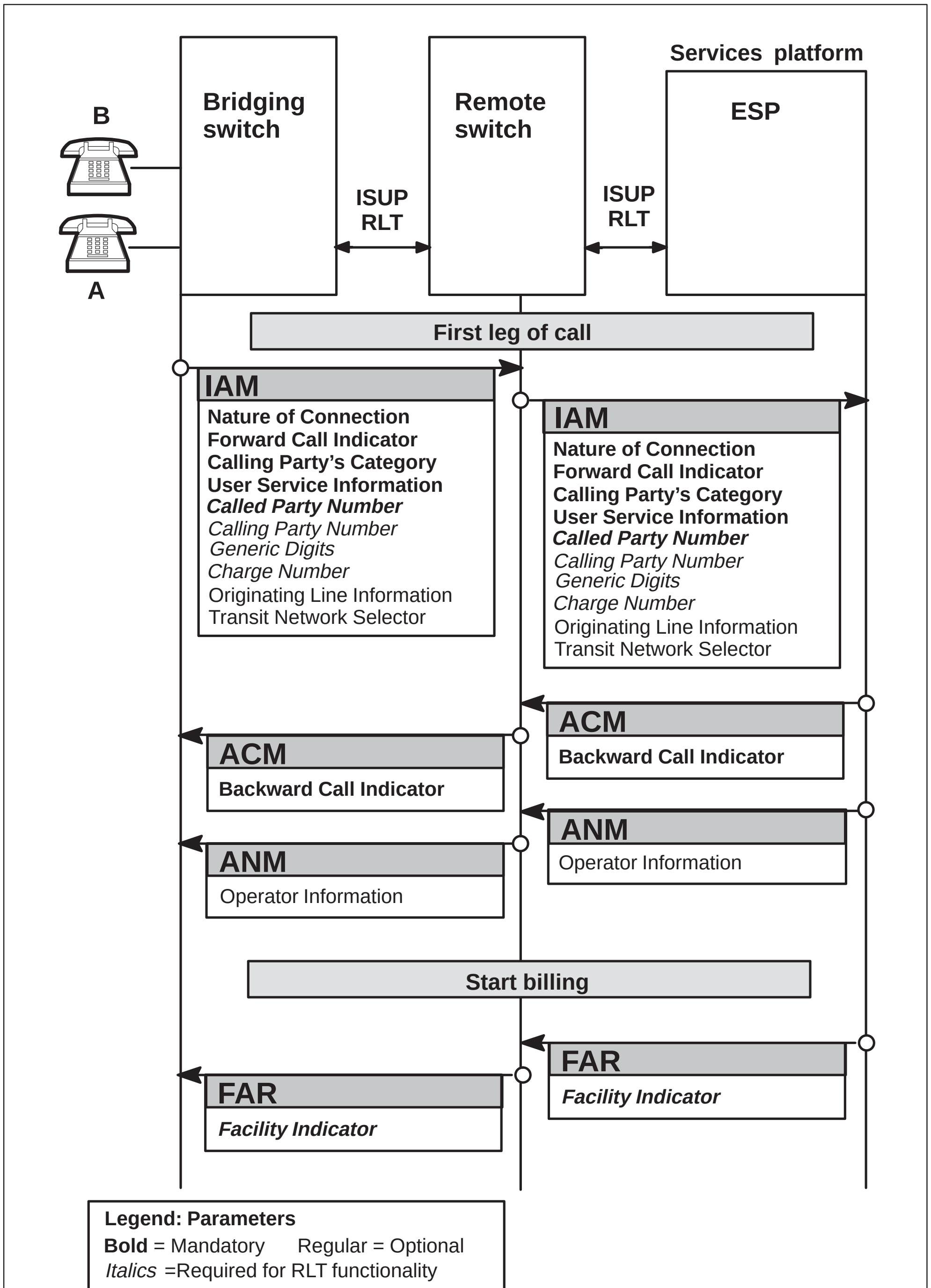
15 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the remote switch, which passes it to the services platform.

16 After bridging the call, the bridging switch formats a Release (REL) message and sends it to the remote switch. The REL message includes a Normal Clearing Cause Indicator parameter.

17 The remote switch sends another REL message to the services platform and releases the connection to the services platform and the corresponding trunks. It also sends a Release Complete (RLC) message back to the bridging switch to confirm the release. This RLC also includes a proper Cause Indicator parameter.

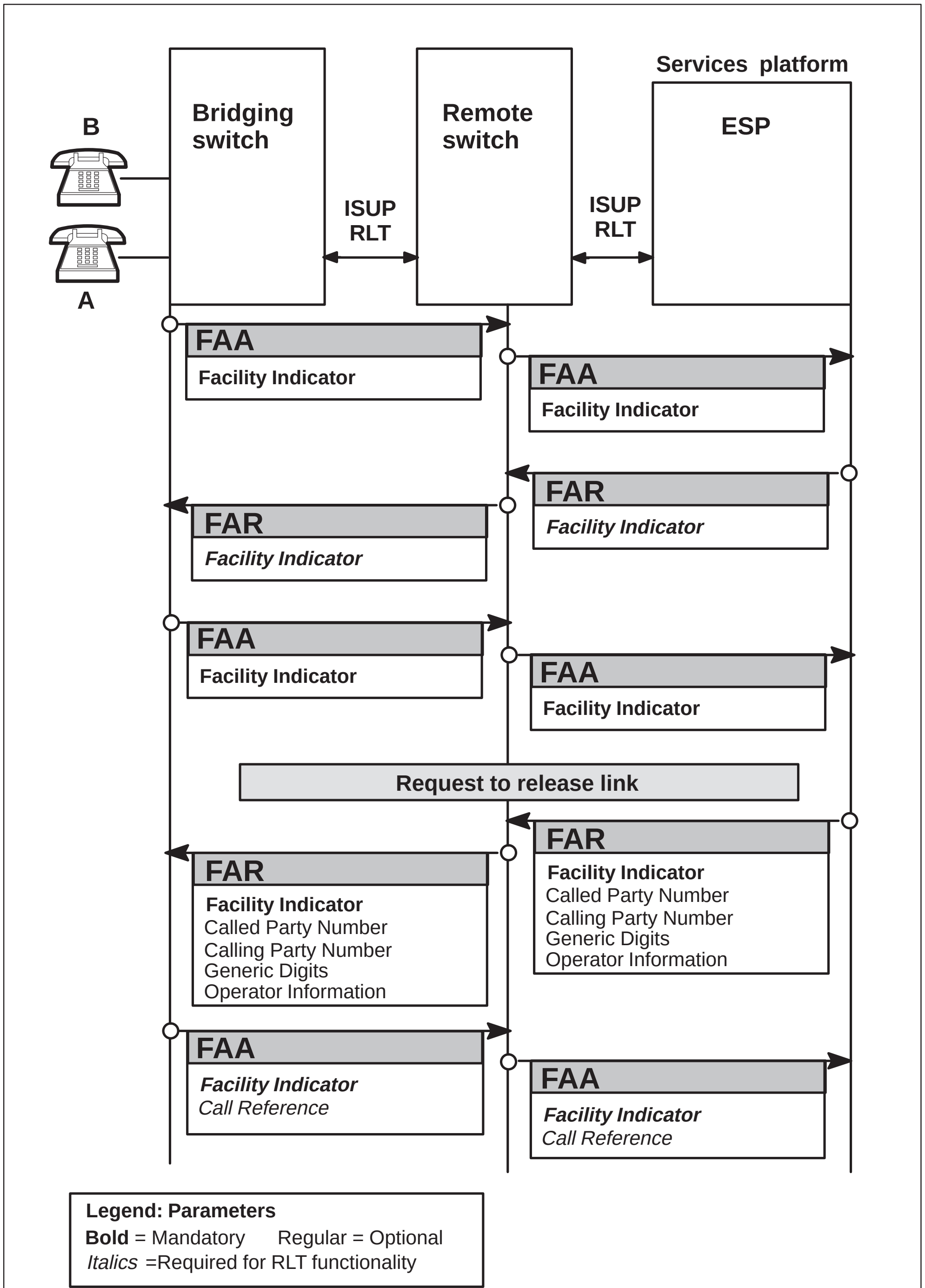
18 The services platform also releases its connections and returns another RLC with a proper Cause Indicator to the remote switch to confirm the release.

Figure 8-2
Message flow for redirect and transfer scenario



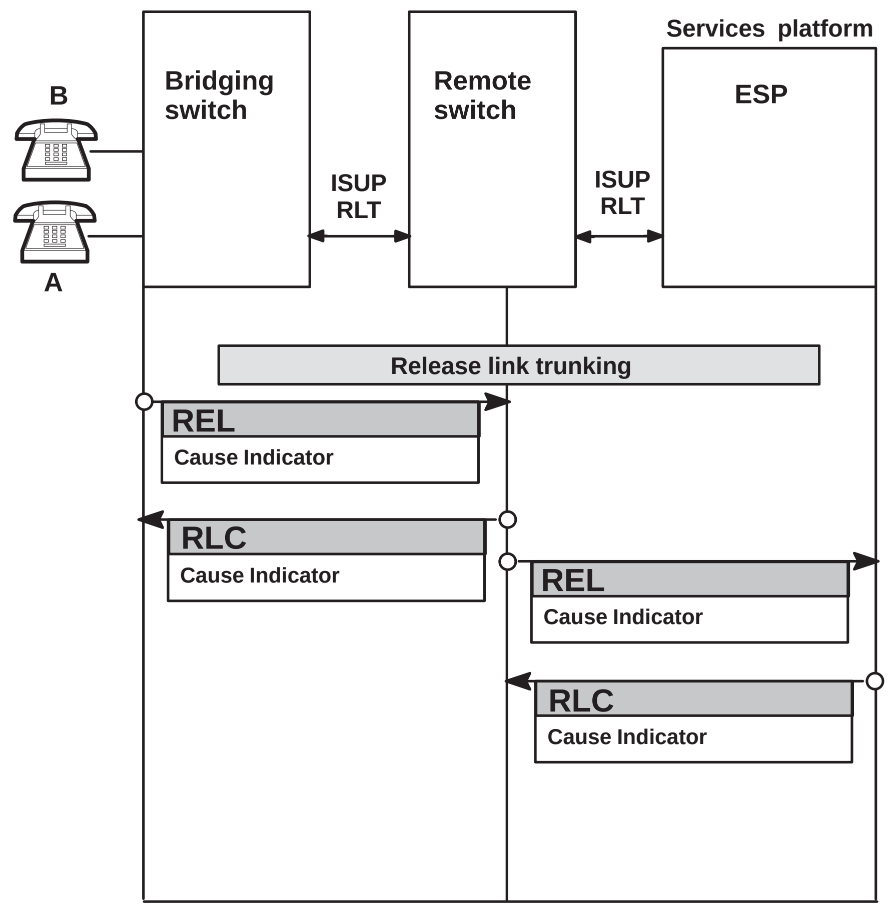
—continued—

Figure 8-2
Message flow for redirect and transfer scenario (continued)



—continued—

Figure 8-2
Message flow for redirect and transfer scenario (continued)



Legend: Parameters
Bold = Mandatory Regular = Optional
Italics =Required for RLT functionality

—end—

ESP redirect and transfer error scenario, FAR message failure and reissue

This section explains the message flow for the redirect and transfer scenario when, for whatever reason, a UCS DMS-250 switch cannot perform the action requested in the Facility Indicator parameter of a FAR message. In this case, the switch involved does not perform the action requested (such as release link trunking) and cannot complete the call. The switches must process the call using call treatment or other means. The error scenario is identical to the standard redirect and transfer scenario up to step 7.

Message flow for redirect and transfer error scenario

Figure 8-3 is a comprehensive message flow diagram for the redirect and transfer error scenario. It shows the sequence for the exchange of messages and parameters between the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform.

Specifically, the message exchange in this error scenario occurs as follows:

1. A switch, the bridging switch in this scenario, receives the call. The switches and services platform exchange messages just as in steps 1-4 in the standard redirect and transfer scenario.
2. The services platform identifies the called party, but does not make the call to that party. First, it initiates billing by sending a Facility Request (FAR) message to the remote switch. Table 8-7 shows parameters in this FAR message that affect RLT functionality.

Table 8-7
RLT parameters in the billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Start Billing Time value that the bridging switch uses.
Generic Digits	This parameter contains values for the following fields: • BILLNUM, value from first FAR • UNIVACC, value from first FAR • PINDIGS, value from first FAR • ACCTCD, value from first FAR
Operator Information	Contains ANM Billing indicator set to first.

3 The remote switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch.

4 The bridging switch also checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. In this scenario, the indicator starts billing.

5 To acknowledge that it received and processed the FAR message, the bridging switch formats a Facility Accept (FAA) message and sends it to the remote switch, which passes it to the services platform.

6 The bridging switch checks a new bridge/redirect FAR message from the services platform. The FAR contains the ANM Billing Indicator field set to last. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. Table 8-8 shows parameters in this FAR message that affect RLT functionality.

Table 8-8
RLT parameters in the bridge/redirect FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Start Billing Time value that the bridging switch uses.
Generic Digits	This parameter contains values for the following fields: • BILLNUM, value from first FAR • UNIVACC, value from first FAR • PINDIGS, value from first FAR • ACCTCD, value from first FAR
Operator Information	Contains ANM Billing indicator set to first.

7 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the remote switch, which passes it to the services platform. The FAR contains only bridging/redirection information.

8 The bridging switch checks a new bridge/redirect FAR message from the services platform. This switch reads and tries to perform the action designated in the FAR message's Facility Indicator parameter. In this scenario, the switch cannot perform the action because the first/last Billing Indicator can only be set to a new value once. Table 8-9 shows parameters in this FAR message that affect RLT functionality.

Table 8-9
RLT parameters in the Redirect FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for Operator Redirect/Transfer value that the bridging switch uses.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call. This parameter also contains the first/last ANM billing indicator.
Calling Party Number	The switches, except bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform provided. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match OSRs on both the services platform and bridging switches. This parameter contains values for the following fields: • BILLNUM, value from second FAR • UNIVACC, value from second FAR • PINDIGS, value from second FAR • ACCTCD, value from fourth FAR

9 The switch that attempted bridging returns a Facility Reject (FRJ) message to the remote switch to indicate that it could not perform the facility request. This message's Cause Indicator parameter contains a Previous Billing Determination value. In this scenario, the switch cannot perform the action because the first/last Billing Indicator can only be set to a new value once. In this scenario, because this request has a higher priority than the primary request, the switch does not execute the primary request and rejects the FAR.

10 The bridging switch checks a new bridge/redirect FAR message from the services platform. The FAR contains only bridging/redirection information. This switch reads and tries to perform the action designated in the FAR message's Facility Indicator parameter. In this scenario, the switch bridges the call. Table 8-10 shows parameters in this FAR message that affect RLT functionality.

Table 8-10
RLT parameters in the Redirect FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for Operator Redirect/Transfer value that the bridging switch uses.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call. This parameter also contains the first/last ANM billing indicator.
Calling Party Number	The switches, except bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the call's OSR.

—continued—

Table 8-10
RLT parameters in the Redirect FAR message (continued)

RLT parameter	Comments
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform provided. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match OSRs on both the services platform and bridging switches. This parameter contains values for the following fields: • BILLNUM, value from second FAR • UNIVACC, value from second FAR • PINDIGS, value from second FAR • ACCTCD, value from third FAR
—end—	

11 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the remote switch, which passes it to the services platform. The FAR contains only bridging/redirection information.

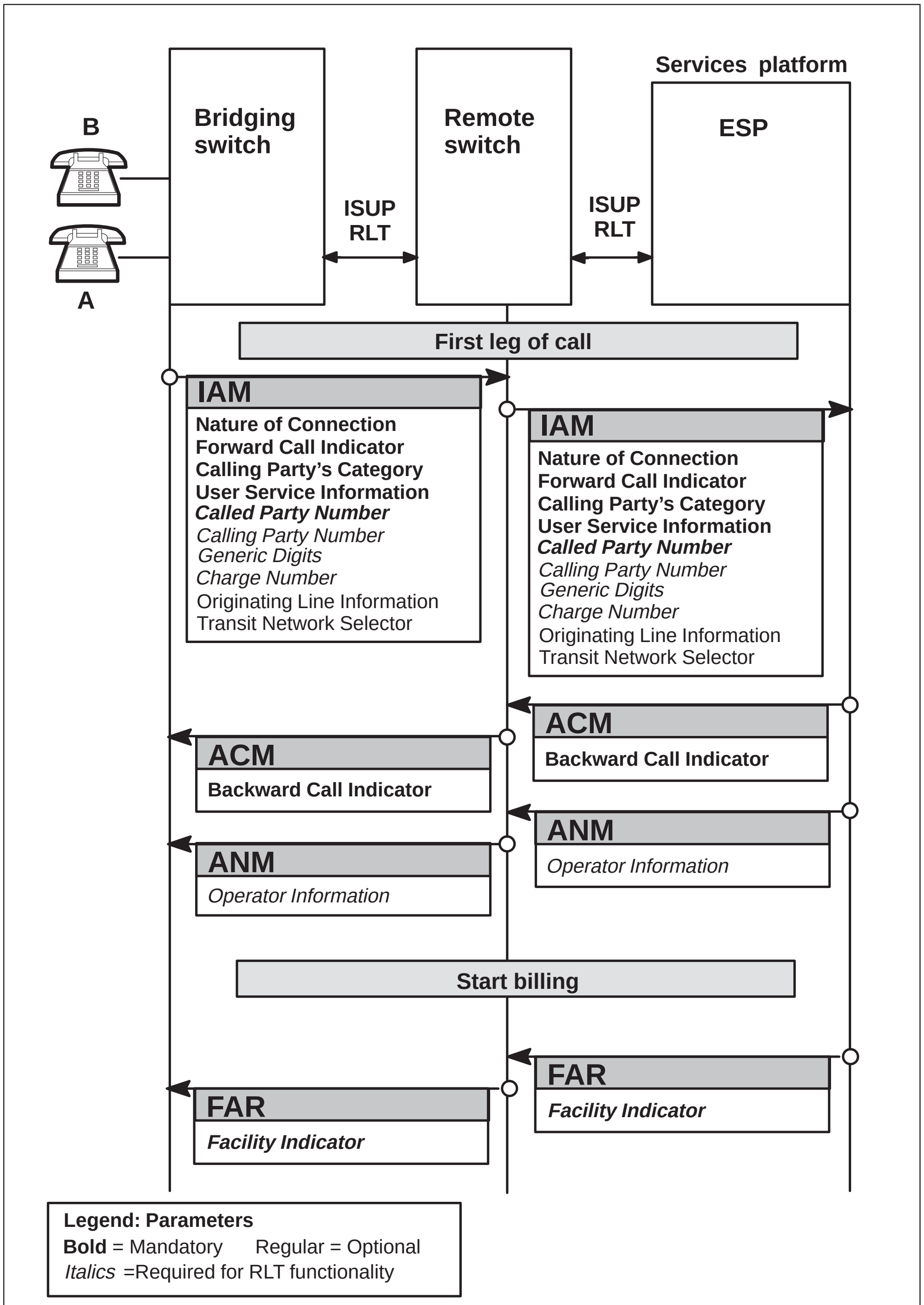
12 After bridging the call, the bridging switch formats a Release (REL) message and sends it to the remote switch. The REL message includes a Normal Clearing Cause Indicator parameter.

13 The remote switch sends another REL message to the services platform and releases the connection to the services platform and the corresponding trunks. It also sends a Release Complete (RLC) message back to the bridging switch to confirm the release. This RLC also includes a proper Cause Indicator parameter.

Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

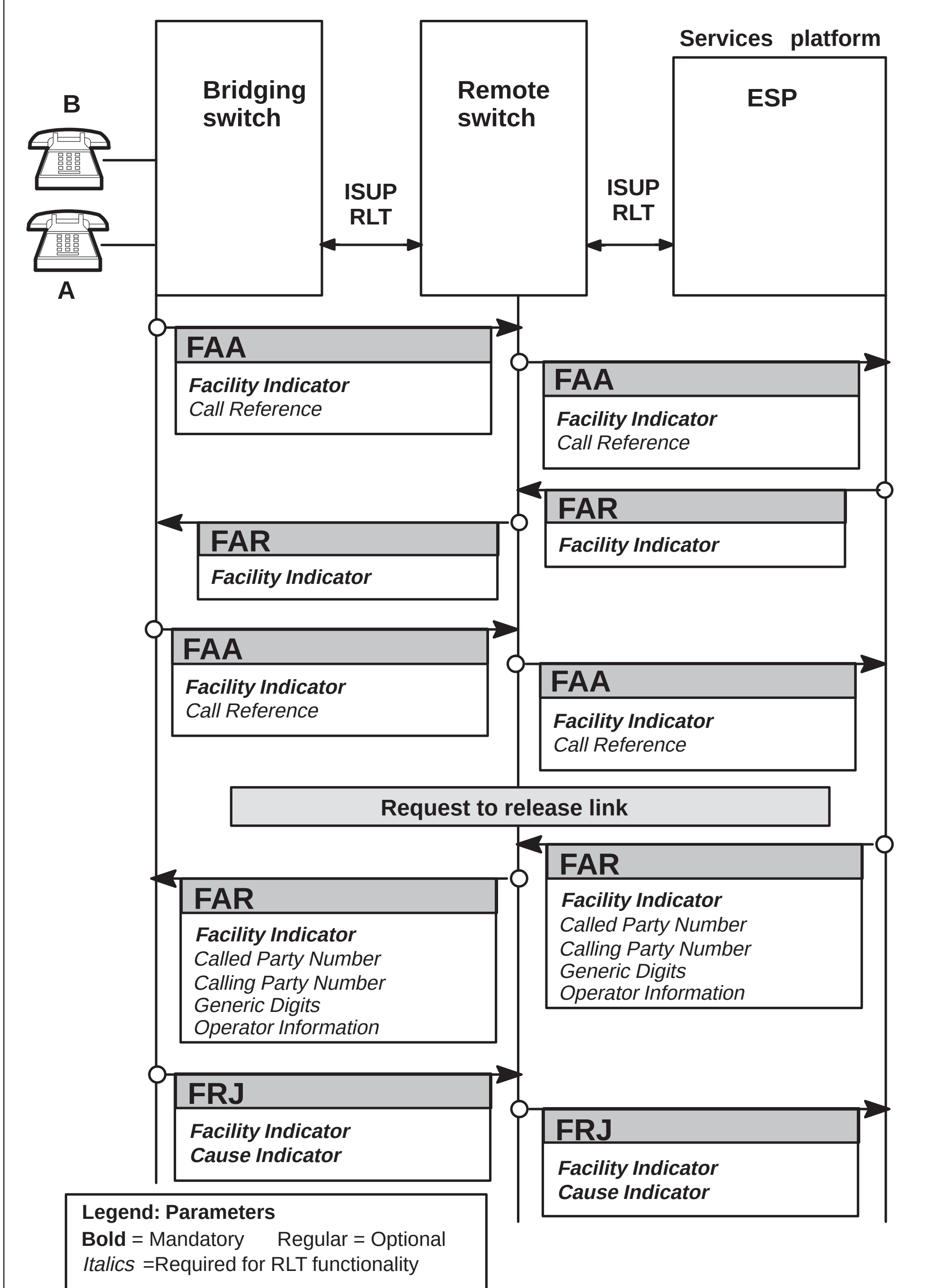
14 The services platform also releases its connections and returns another RLC with a proper Cause Indicator to the remote switch to confirm the release.

Figure 8-3
Message flow for redirect and transfer error scenario



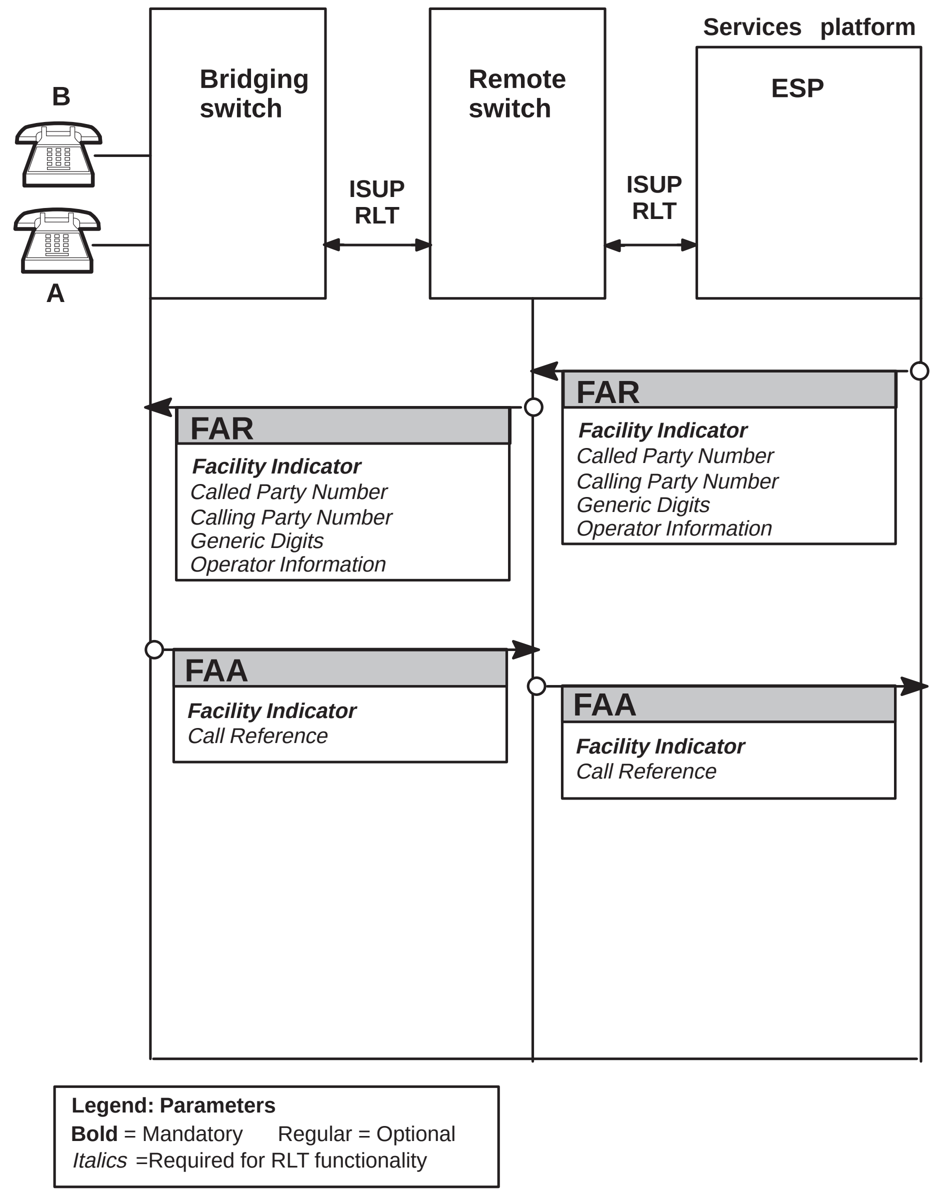
—continued—

Figure 8-3
Message flow for redirect and transfer error scenario (continued)



—continued—

Figure 8-3
Message flow for redirect and transfer error scenario (continued)



—end—

Third-party interaction scenario, billing setup using an IAM, update using a FAR message

In this scenario, a customer places a call to the ESP and requests the ESP to establish a three-way call. When the parties are in conference, the ESP requests release link trunking. After the appropriate switch bridges the call, the release link trunking capability frees the ESP and the remote UCS DMS-250 switch.

The trunks connecting the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform are all ISUP IMTs with RLT functionality. The trunk connecting the caller to the bridging switch is one of the following:

- a PTS trunk
- a PRI trunk
- an ISUP FGD trunk
- an ISUP IMT without RLT functionality

By definition, a switch only bridges a call when it cannot remove itself from the connection by passing the bridge request to another switch.

Calls involving a third party, such as an ESP, are each logically two calls from th point of view of the switch, each having its own billing information. When these two logical legs are bridged, the respective sets of billing information must be merged into one. When the switch merges billing fields, it takes the values from the following call legs as shown in Table 8-11.

Table 8-11
Billing merge values

Billing field	Value from
BILLNUM	first call leg; if not available, second call leg
UNIVACC	first call leg
PINDIGS	second call leg; if not available, first call leg
ACCTCD	second call leg; if not available, first call leg

Note: PRI trunks and ISUP IMTs do not support call reorigination.

Message flow for third-party interaction

Figure 8-4 is a comprehensive message flow diagram for the third-party interaction scenario. It shows the sequence for the exchange of messages between the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform.

Specifically, the message exchange occurs as follows:

1 A switch, the bridging switch in this scenario, receives a call. Based on the nature of the call, the bridging switch formats an IAM and sends it to another switch, the remote switch in this scenario.

   Note: If the call is an N00 services call, the switch performs N00 lookup (that is, it translates the N00 services call into a ten-digit number). The switch places the N00 number into the CDRs Dialed Number field and places the ten-digit number into the CDR's Called Number field.

   Note: The CDR fields BILLNUM, UNIVACC, PINDIGS, and ACCTCD are initially populated by call setup.

2 In response to the IAM from the bridging switch, the remote switch sends another IAM to the services platform. Table 8-12 shows the important RLT parameters in this IAM.

Table 8-12
RLT parameters in the first leg IAM

RLT parameter	Comments
Called Party Number	The switches use the number of the party called when generating billing records. The switches place this value in the Called Number field of the CDR for the call. This parameter also provides an NOA value that indicates whether the call is operator-assisted or whether the switch must treat the call.
Charge Number	This parameter contains an ANI value. If the IAM contains this parameter, the switches add this value to the ANI SPILL field in the call's CDR. If the IAM does not contain this parameter, the switches get the ANI value from the Calling Party Number parameter.

—continued—

Table 8-12
RLT parameters in the first leg IAM (continued)

RLT parameter	Comments
Calling Party Number	This parameter contains an ANI value. The switches add this ANI value to the ANI SPILL field in the call's CDR, unless they pull the ANI value from the Charge Number parameter.
Generic Digits	This parameter contains values for the following CDR fields: • BILLNUM • UNIVACC • PINDIGS • ACCTCD
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (see Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).
—end—	

3 The services platform returns an ACM to the remote switch. The ACM confirms that the services platform received the information needed to route the call to its destination. The remote switch passes the ACM to the bridging switch.

4 When the services platform answers the call, the platform sends an ANM to the remote switch. The remote switch formats and sends another ANM to the bridging switch.

5 The services platform identifies the called party and initiates the second leg of the call, formatting a new IAM and sending it to the remote switch. Because the trunk connecting the remote switch and the services platform supports RLT functionality, the IAM includes the Supplementary Line Information (SLI) parameter. Table 8-13 shows parameters in this IAM that affect RLT functionality.

Table 8-13
RLT parameters in the second leg IAM

RLT parameter	Comments
Called Party Number	The switches use the number of the party called when generating billing records. The switches place this value in the Called Number field of the CDR for the call. This parameter also provides an NOA value that indicates whether the call is operator-assisted or whether the switch must treat the call.
Charge Number	This parameter contains an ANI value. If the IAM contains this parameter, the switches add this value to the ANI SPILL field in the call's CDR. If the IAM does not contain this parameter, the switches get the ANI value from the Calling Party Number parameter.
Calling Party Number	This parameter contains an ANI value. The switches add this ANI value to the ANI SPILL field in the call's CDR, unless they pull the ANI value from the Charge Number parameter.
Supplementary Line Information (SLI)	This parameter causes a receiving switch to include a Call Reference parameter in an ACM when it responds. In this scenario, this parameter has an "RLT Call Operation" value.
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (see Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).

6 When it receives the IAM, the remote switch formats another IAM and sends it to the bridging switch. Because the trunk connecting the remote switch and the bridging switch supports RLT functionality, this IAM also includes the SLI parameter.

7 In response to the IAM with the SLI parameter, the bridging switch returns an ACM with a Call Reference parameter that identifies the second leg of the call. This ACM indicates that the terminating switch received the information that it needs to route the call.

8 The remote switch copies and saves the Call Reference parameter from the ACM. Then it changes the Call Reference in the ACM to contain the Call Reference information for the second leg of the call. The switch routes this ACM to the services platform, which also saves the Call Reference parameter.

9 When the terminating party of the second leg answers, the bridging switch formats an ANM and sends it to the remote switch. The remote switch passes the ANM to the services platform, connecting it in a three-way call with the calling party and called party.

10 The services platform initiates billing by sending a FAR message to the remote switch. Table 8-14 shows parameters in this FAR message that affect RLT functionality.

Table 8-14
RLT parameters in the Billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Start Billing Time value that the bridging switch uses.
Operator Information	This parameter contains the ANM Billing Indicator set to either first or last.

11 The remote switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch.

12 The bridging switch also checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message’s Facility Indicator parameter. In this scenario, the indicator starts billing.

Note 1: In this example, the services platform, remote, and bridging switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message's Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the bridging switch and the remote switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

13 To acknowledge that it received and processed the FAR message, the bridging switch formats an FAA message and sends it to the remote switch, which passes it to the services platform.

14 The ESP initiates release link trunking, sending another FAR message to the remote switch. Table 8-15 shows parameters in this FAR message that affect RLT functionality.

Note: A services platform or switch always sends a FAR message to the trunk circuit of the leg for which it does not have Call Reference information. In this scenario, the services platform sends the FAR message to the trunk of the call's first leg.

Table 8-15
RLT parameters in the third-party FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for 3rd Party Interaction Call value that the bridging switch uses.
Call Reference	This parameter holds the switch's call identification and point code values for a call. The bridging switch uses this information to bridge the correct two calls.
—continued—	

Table 8-15
RLT parameters in the third-party FAR message (continued)

RLT parameter	Comments
	Note: As each intermediate tandem switch passes this FAR message, it replaces this parameter's call identification and point code values with values received in an ANM or ACM.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.
Calling Party Number	The switches, except the bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform provided. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match OSRs on both the services platform and bridging switches. This parameter contains values for the following CDR fields: • BILLNUM, value from call setup • UNIVACC, value from call setup • PINDIGS, value from IAM • ACCTCD, value from second FAR
—end—	

15 Using the information in the FAR message, the remote switch identifies the associated call (the second call leg). By examining the point codes for the trunks of each leg of the call, it also determines whether both legs connect to the bridging switch.

16 Because the point codes are the same, the remote switch retrieves the Call Reference information that it copied when it received the ACM from the bridging switch (see step 8). The remote switch adds this Call Reference information to a FAR message and sends the message to the bridging switch.

17 The bridging switch reads the message's Facility Indicator and bridges the originating trunk of the first call leg to the terminating trunk of the second call leg. The bridging switch uses the information in the FAR message's Call Reference parameter to identify the second leg.

18 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the remote switch, which passes it to the services platform.

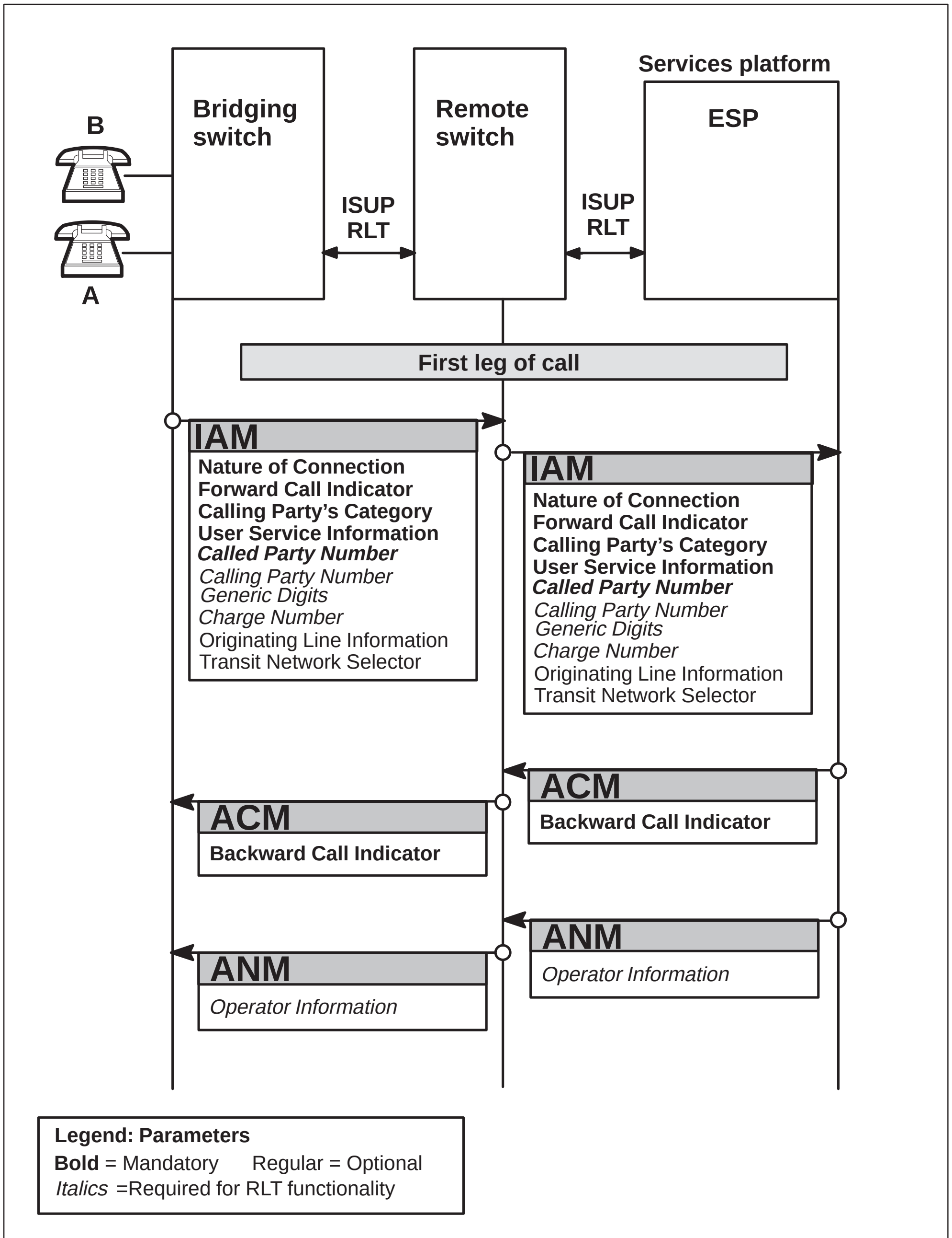
19 After bridging the call, the bridging switch formats two REL messages and sends them to the remote switch to release the call connections for both call legs. The REL messages include Normal Clearing Cause Indicator parameters.

20 The remote switch sends two REL messages to the services platform and releases the call connections to the services platform and the corresponding trunks. It also sends two RLC messages back to the bridging switch to confirm the release of the first and second call legs. The RLC's also include proper Cause Indicator parameters.

Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

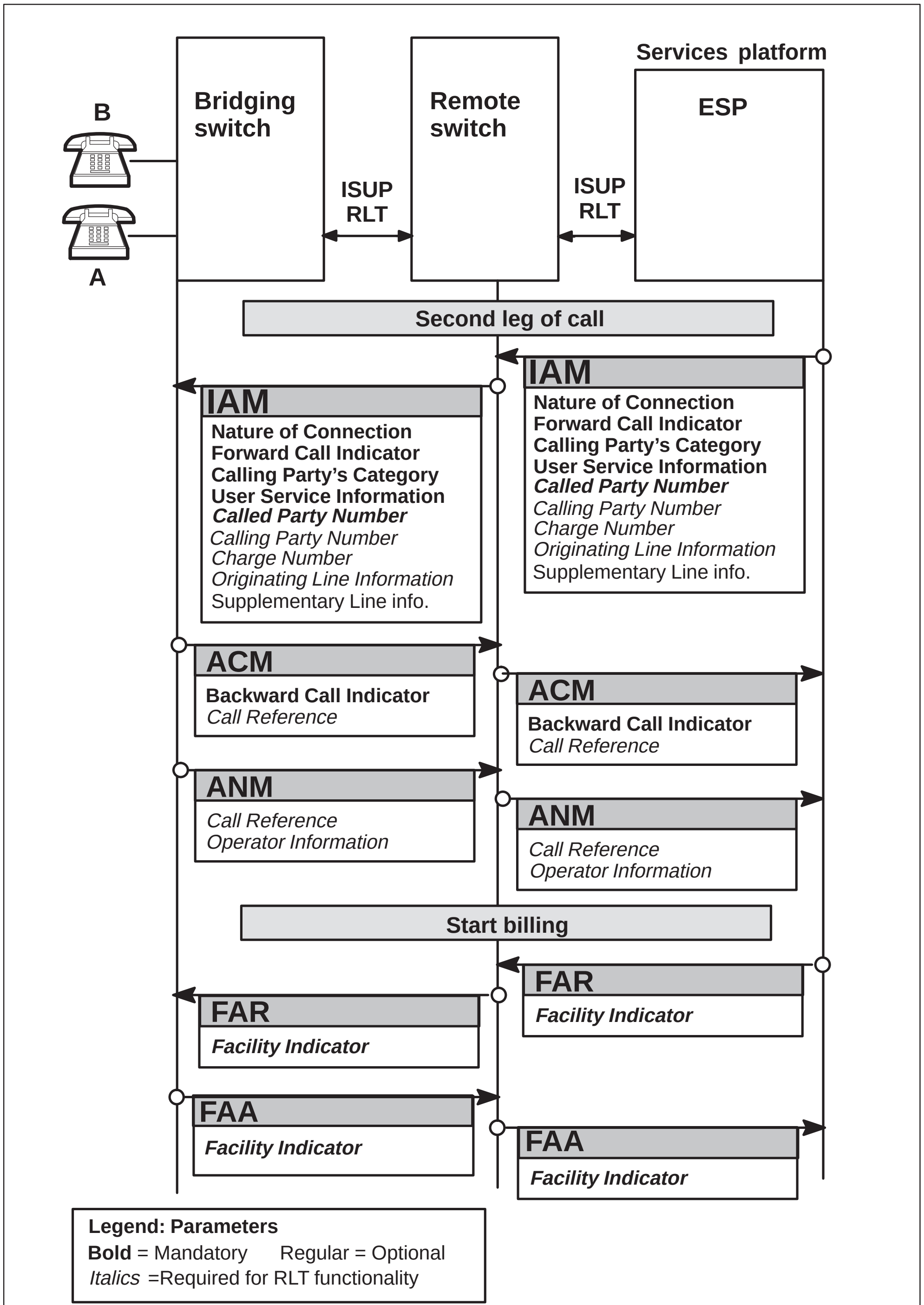
21 The services platform also releases its connections and returns two RLC's with proper Cause Indicator parameters to the remote switch to confirm the release of both call legs.

Figure 8-4
Message flow for third-party interaction scenario



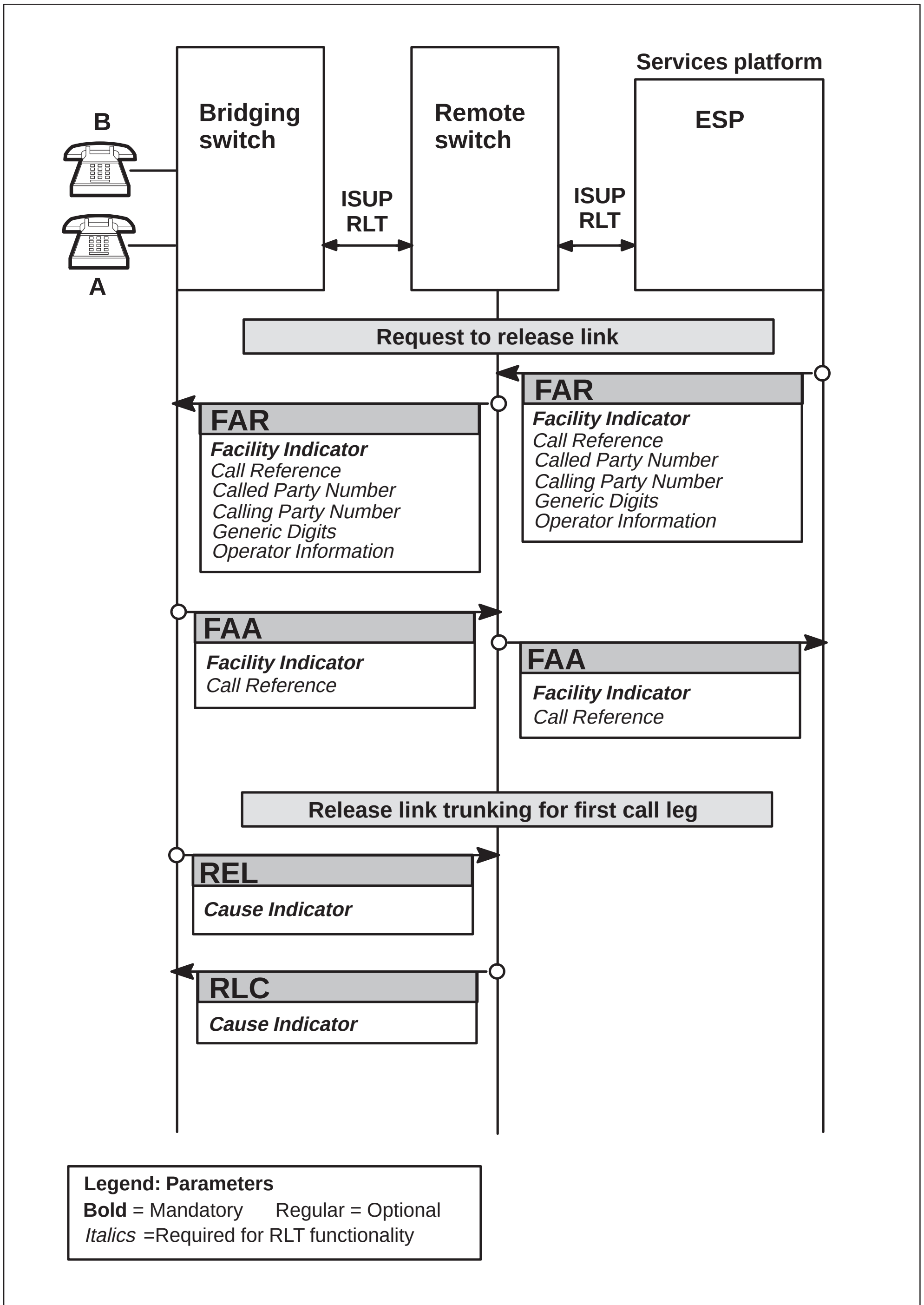
—continued—

Figure 8-4
Message flow for third-party interaction scenario (continued)



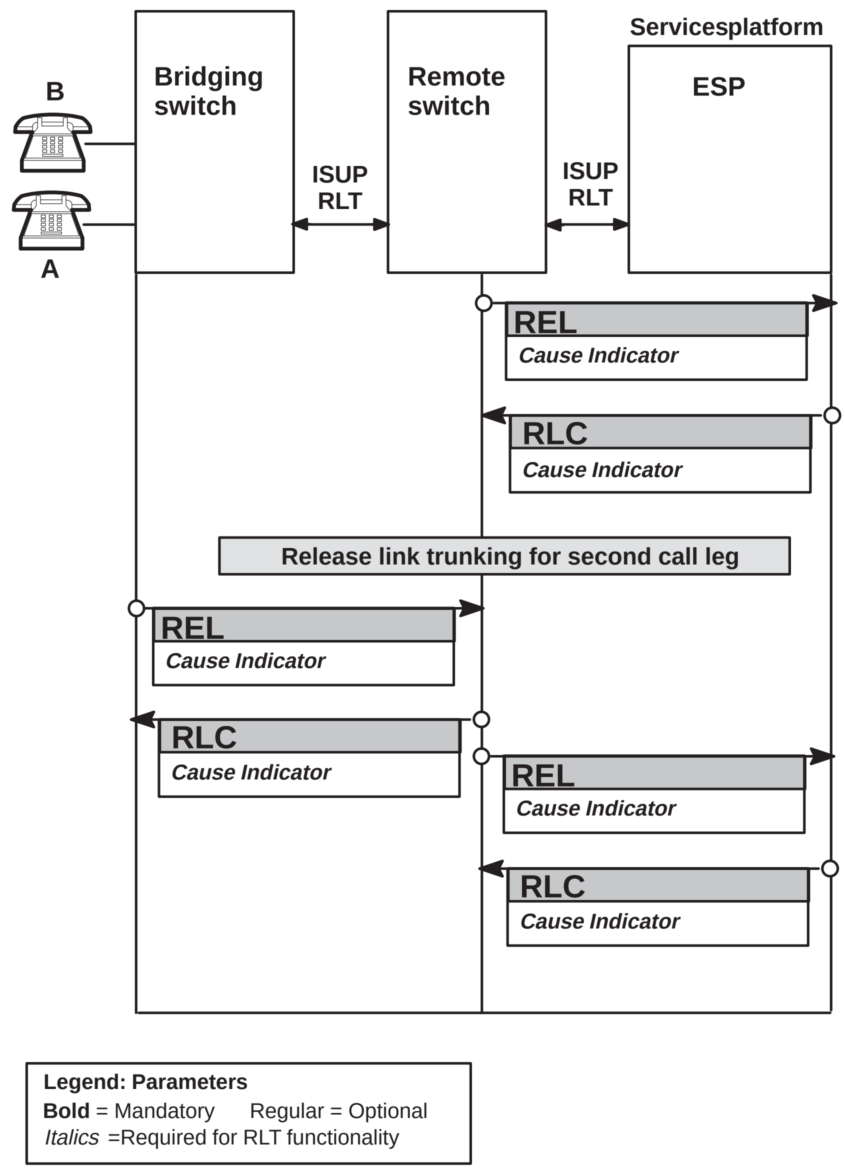
—continued—

Figure 8-4
Message flow for third-party interaction scenario (continued)



—continued—

Figure 8-4
Message flow for third-party interaction (continued)



—end—

Third-party interaction error scenario, failure to update, update on bridging

This section explains the message flow for the third-party interaction scenario when, for whatever reason, a UCS DMS-250 switch or interconnecting trunk cannot perform the action requested in the Facility Indicator parameter of a FAR message. In this case, the switch involved does not perform the action requested (such as release link trunking), but may complete the call, depending on conditions. The error scenario is identical to the standard third-party interaction scenario up to step 9.

Message flow for third-party interaction error scenario

Figure 8-5 is a comprehensive message flow diagram for the third-party interaction error scenario. It shows the sequence for the exchange of messages between the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform.

Specifically, the message exchange occurs as follows:

1 A switch, the bridging switch in this scenario, receives a call. The switches and services platform exchange messages just as in steps 1-9 in the standard third-party interaction error scenario.

2 The services platform initiates billing by sending a FAR message to the remote switch. Table 8-16 shows parameters in this FAR message that affect RLT functionality.

Table 8-16
RLT parameters in the Billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Start Billing Time value that the bridging switch uses.
Operator Information	This parameter contains the ANM Billing Indicator set to last.
Generic Digits	This parameter contains values for the following CDR fields: • BILLNUM, value from call setup • UNIVACC, value from call setup • PINDIGS, value from call setup • ACCTCD, value from first FAR

3 The remote switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch.

4 The bridging switch also checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. In this scenario, the indicator starts billing.

Note 1: In this example, the services platform, remote, and bridging switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message's Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the bridging switch and the remote switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

5 To acknowledge that it received and processed the FAR message, the bridging switch formats an FAA message and sends it to the remote switch, which passes it to the services platform.

6 The ESP initiates release link trunking, sending another FAR message to the remote switch. Table 8-17 shows parameters in this FAR message that affect RLT functionality.

Note: A services platform or switch always sends a FAR message to the trunk circuit of the leg for which it does not have Call Reference information. In this scenario, the services platform sends the FAR message to the trunk of the call's first leg.

Table 8-17
RLT parameters in the third-party FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for 3rd Party Interaction Call value that the bridging switch uses.
Call Reference	This parameter holds the switch's call identification and point code values for a call. The bridging switch uses this information to bridge the correct two calls. ***Note:*** As each intermediate tandem switch passes this FAR message, it replaces this parameter's call identification and point code values with values received in an ANM or ACM.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.

—continued—

Table 8-17
RLT parameters in the third-party FAR message (continued)

RLT parameter	Comments
Calling Party Number	The switches, except bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform provided. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match OSRs on both the services platform and bridging switches. This parameter contains values for the following CDR fields: • BILLNUM, value from second FAR • UNIVACC, value from call setup • PINDIGS, value from call setup • ACCTCD, value from first FAR
—end—	

7 Using the information in the FAR message, the remote switch identifies the associated call (the second call leg). By examining the point codes for the trunks of each leg of the call, it also determines whether both legs connect to the bridging switch.

8 Because the point codes are the same, the remote switch retrieves the Call Reference information that it copied when it received the ACM from the bridging switch. The remote switch adds this Call Reference information to a FAR message and sends the message to the bridging switch.

9 The bridging switch reads the message's Facility Indicator and bridges the originating trunk of the first call leg to the terminating trunk of the second call leg. The bridging switch uses the information in the FAR message's Call Reference parameter to identify the second leg. Table 8-18 shows parameters in this FAR message that affect RLT functionality.

Table 8-18
RLT parameters in the billing second-leg third-party FAR message

RLT parameter	Comments
Generic Digits	This parameter contains values for the following CDR fields: • BILLNUM, value from IAM • UNIVACC, value from IAM • PINDIGS, value from IAM • ACCTCD, value from second FAR

10 The switch that attempted bridging returns a Facility Reject (FRJ) message to the remote switch to indicate that it could not perform the facility request. This message's Cause Indicator parameter contains a Previous Billing Determination value. In this scenario, the switch cannot perform the action because the first/last Billing Indicator can only be set to a new value once. In this scenario, because this request has a higher priority than the primary request, the switch does not execute the primary request and rejects the FAR.

11 The operator or ESP at the services platform initiates release link trunking, sending another FAR message to the remote switch. Table 8-19 shows parameters in this FAR message that affect RLT functionality.

Note: A services platform or switch always sends a FAR message to the trunk circuit of the leg for which it does not have Call Reference information. In this scenario, the services platform sends the FAR message to the trunk of the call's first leg.

Table 8-19
RLT parameters in the third-party FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for 3rd Party interaction Call value that the bridging switch uses.
Call Reference	This parameter holds the switch's call identification and point code values for a call. The bridging switch uses this information to bridge the correct two calls. ***Note:*** As each intermediate tandem switch passes this FAR message, it replaces this parameter's call identification and point code values with values received in an ANM or ACM.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.
Calling Party Number	The switches, except the bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the OSR.
Generic Digits	This parameter contains values for the following CDR fields merged from both call legs: • BILLNUM, value from second FAR • UNIVACC, value from call setup • PINDIGS, value from IAM • ACCTCD, value from third FAR

12 Using the information in the FAR message, the remote switch identifies the associated call (the second call leg). By examining the point codes for the trunks of each leg of the call, it also determines whether both legs connect to the bridging switch.

13 Because the point codes are the same, the remote switch retrieves the Call Reference information that it copied when it received the ACM from the bridging switch. The remote switch adds this Call Reference information to a FAR message and sends the message to the bridging switch.

14 The bridging switch reads the message's Facility Indicator and bridges the originating trunk of the first call leg to the terminating trunk of the second call leg. The bridging switch uses the information in the FAR message's Call Reference parameter to identify the second leg.

15 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the remote switch, which passes it to the services platform.

16 After bridging the call, the bridging switch formats two REL messages and sends them to the remote switch to release the call connections for both call legs. The REL messages include Normal Clearing Cause Indicator parameters.

17 The remote switch sends two REL messages to the services platform and releases the call connections to the services platform and the corresponding trunks. It also sends two RLC messages back to the bridging switch to confirm the release of the first and second call legs. The RLC's also include proper Cause Indicator parameters.

Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

18 The services platform also releases its connections and returns two RLC's with proper Cause Indicator parameters to the remote switch to confirm the release of both call legs.

Figure 8-5
Message flow for third-party interaction error scenario

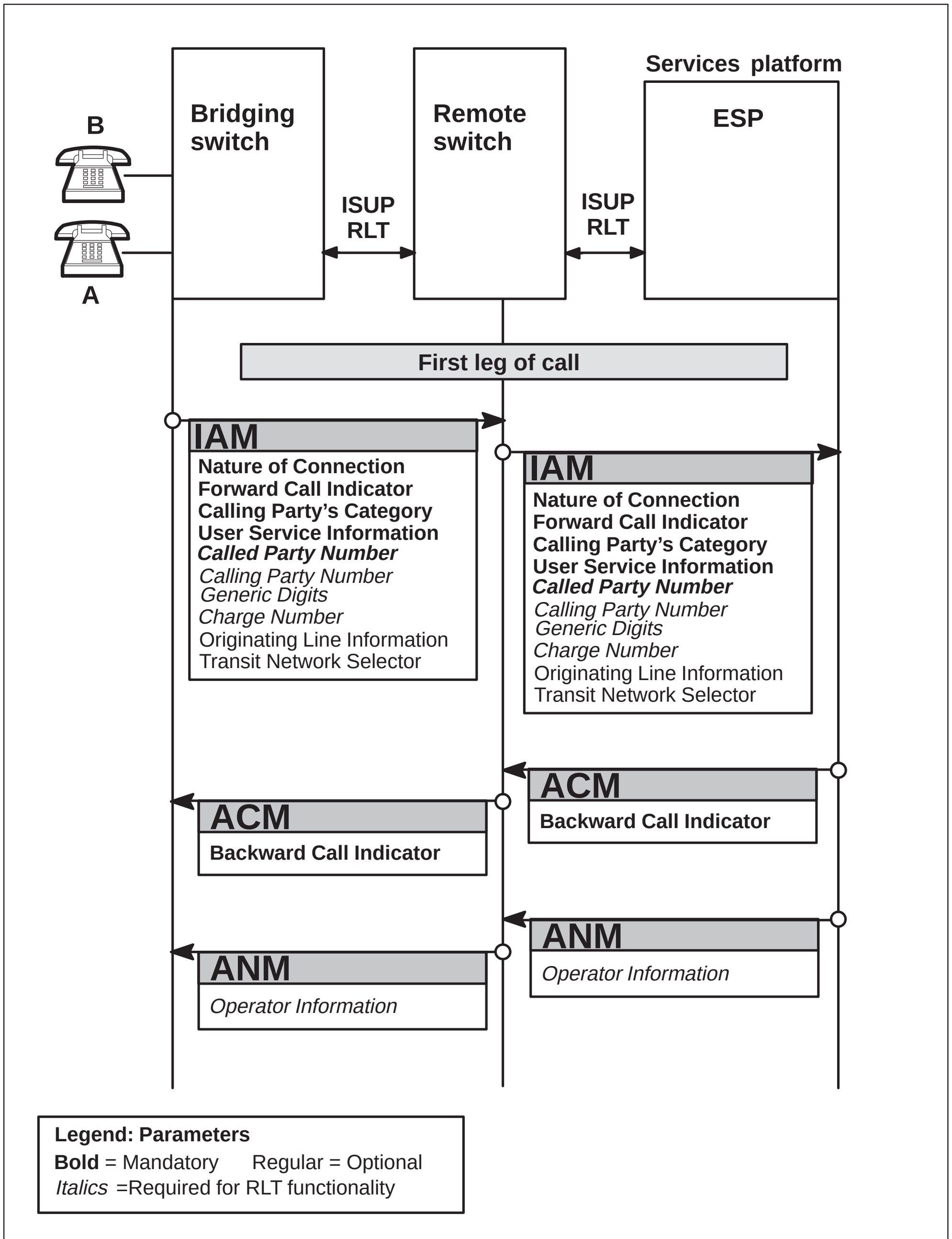


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Figure 8-5
Message flow for third-party interaction error scenario (continued)

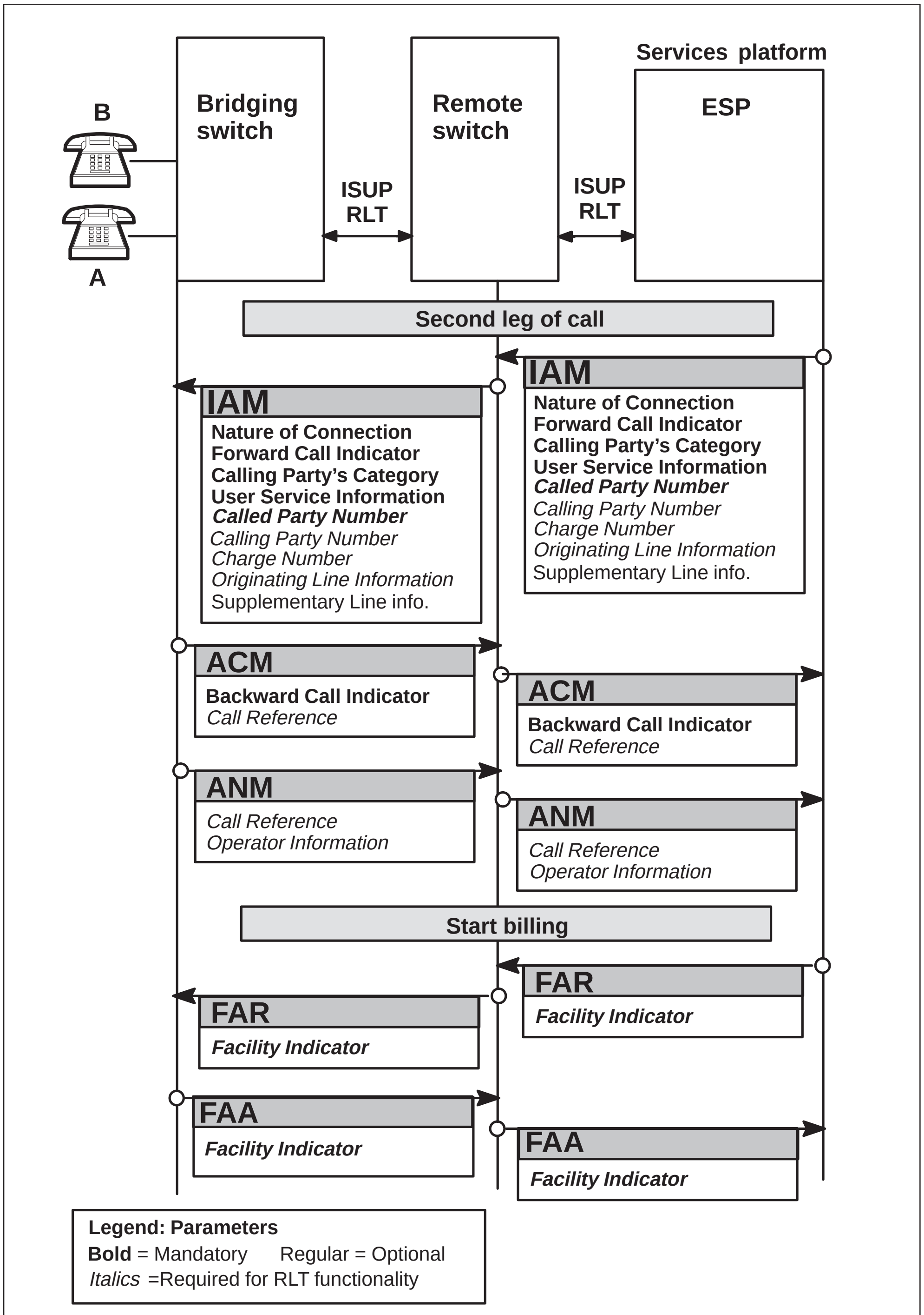

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Figure 8-5
Message flow for third-party interaction error scenario (continued)

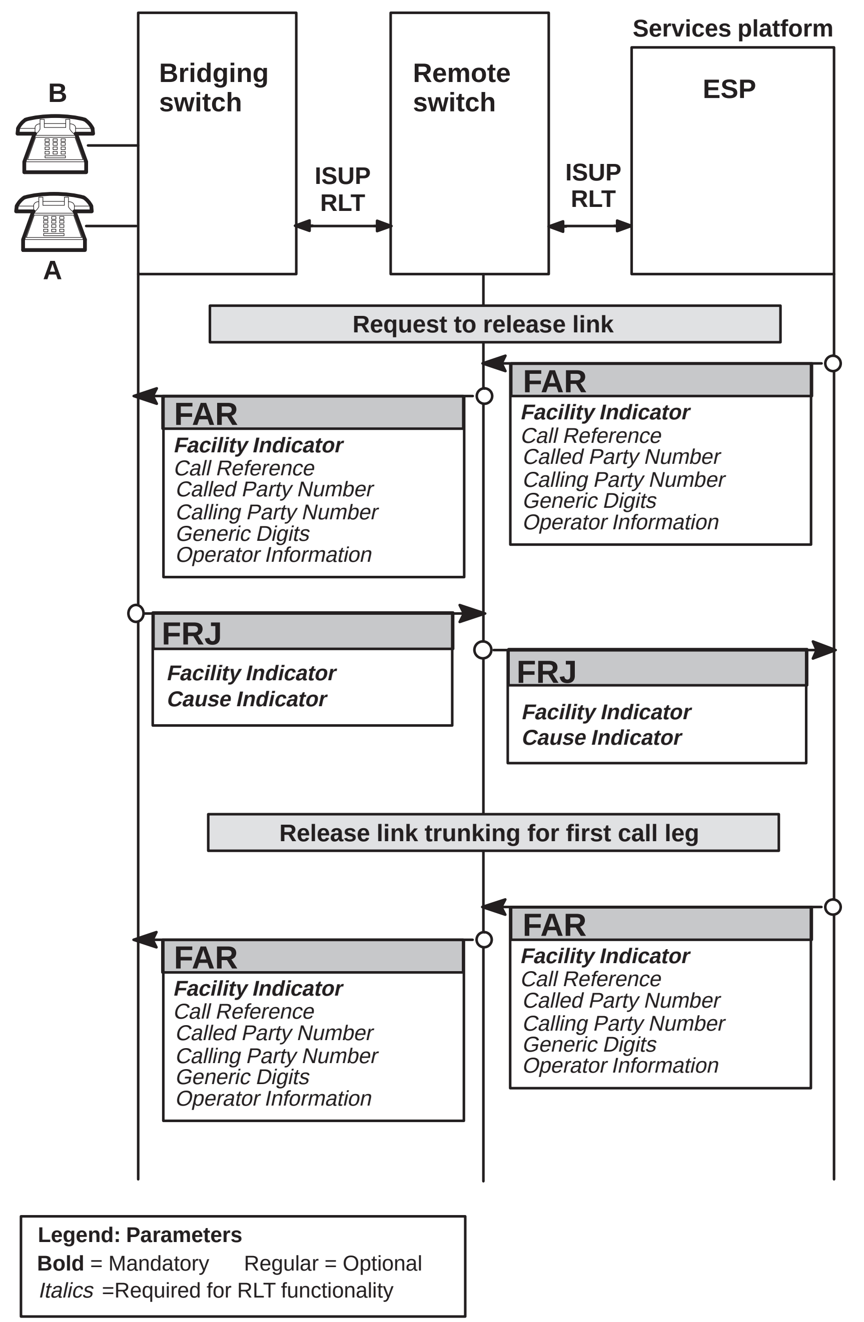

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Figure 8-5
Message flow for third-party interaction error scenario (continued)

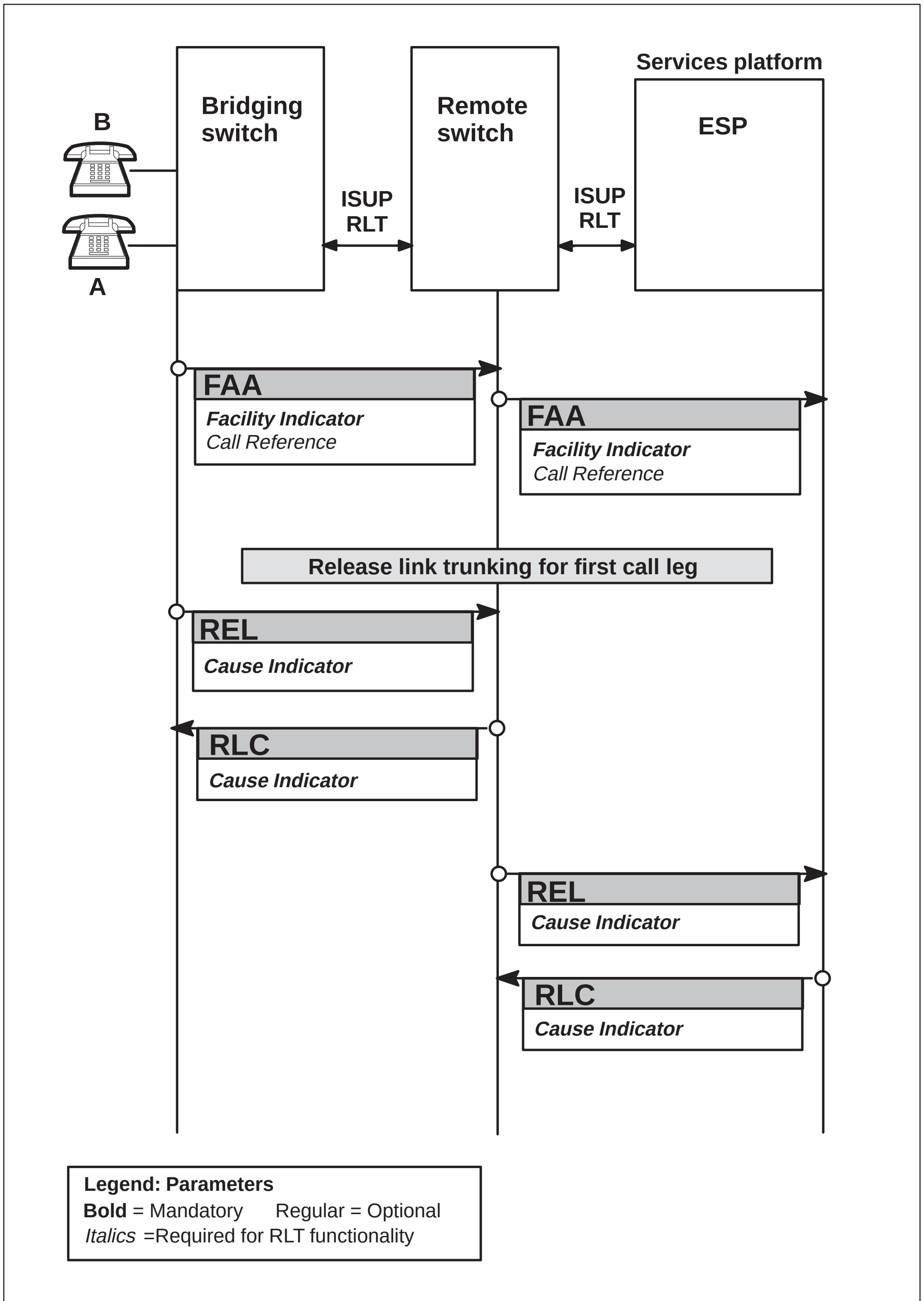

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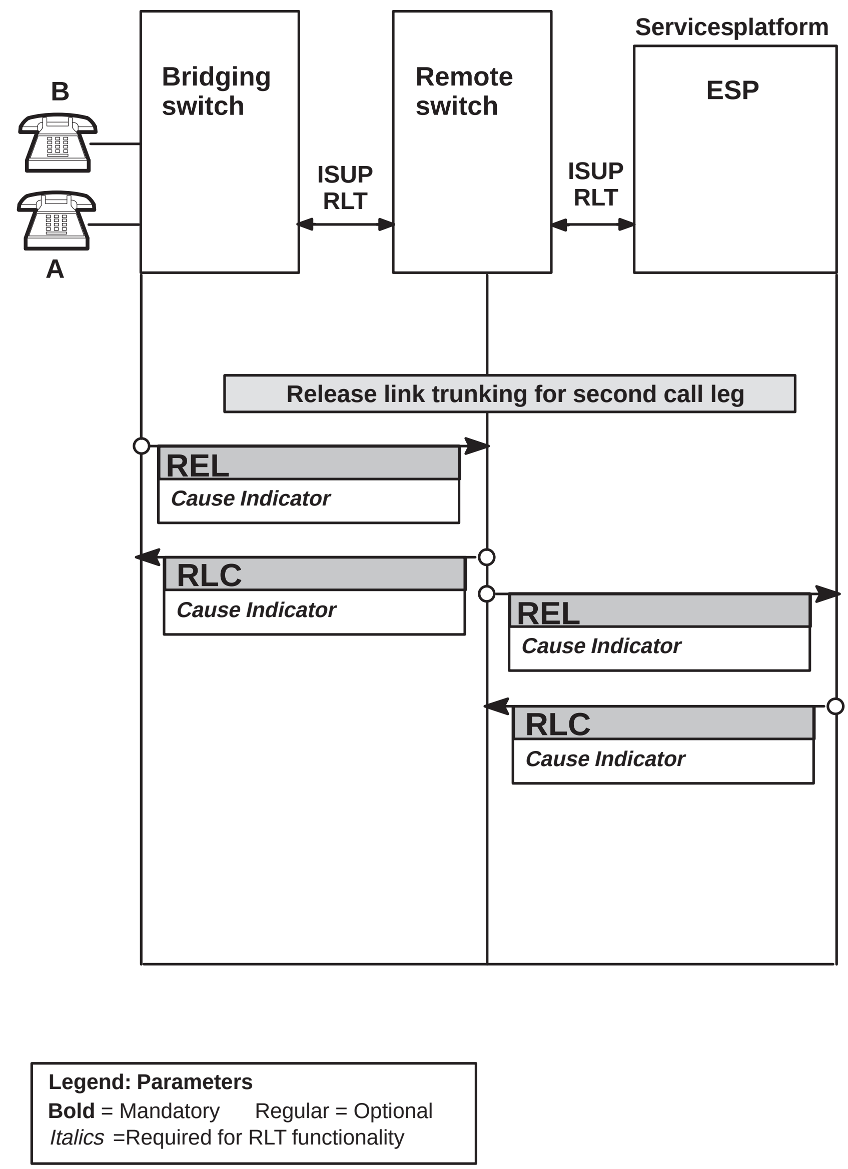
Figure 8-5
Message flow for third-party interaction error scenario (continued)



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Third-party interaction scenario, successful update

In this scenario, a customer makes a call that requires the ESP to place the three-way call. When the parties are in conference, the ESP requests release link trunking. After the appropriate switch bridges the call, the release link trunking capability frees the services platform and the remote UCS DMS-250 switch.

The trunks connecting the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform are all ISUP IMTs with RLT functionality. The trunk connecting the caller to the bridging switch is one of the following:

- a PTS trunk
- a PRI trunk
- an ISUP FGD trunk
- an ISUP IMT without RLT functionality

By definition, a switch only bridges a call when it cannot remove itself from the connection by passing the bridge request to another switch.

Calls involving a third party, such as an ESP, are each logically two calls from the point of view of the switch, each having its own billing information. When these two logical legs are bridged, the respective sets of billing information must be merged into one. When the switch merges billing fields, it takes the values from the following call legs as shown in Table 8-20.

Table 8-20
Billing merge values

Billing field	Value from
BILLNUM	first call leg; if not available, second call leg
UNIVACC	first call leg
PINDIGS	second call leg; if not available, first call leg
ACCTCD	second call leg; if not available, first call leg

Note: PRI trunks and ISUP IMTs do not support call reorigination.

Message flow for third-party interaction

Figure 8-6 is a comprehensive message flow diagram for the third-party interaction scenario. It shows the sequence for the exchange of messages between the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform.

Specifically, the message exchange occurs as follows:

1. A switch, the bridging switch in this scenario, receives a call. Based on the nature of the call, the bridging switch formats an IAM and sends it to another switch, the remote switch in this scenario.

   Note: The CDR fields BILLNUM, UNIVACC, PINDIGS, and ACCTCD are initially populated by call setup.

2. In response to the IAM from the bridging switch, the remote switch sends another IAM to the services platform. Table 8-21 shows parameters in this IAM that affect RLT functionality.

Table 8-21
RLT parameters in the first leg IAM

RLT parameter	Comments
Called Party Number	The switches use the number of the party called when generating billing records. The switches place this value in the Called Number field of the CDR for the call. This parameter also provides an NOA value that indicates whether the call is operator-assisted or whether the switch must treat the call.
Charge Number	This parameter contains an ANI value. If the IAM contains this parameter, the switches add this value to the ANI SPILL field in the call's CDR. If the IAM does not contain this parameter, the switches get the ANI value from the Calling Party Number parameter.
Calling Party Number	This parameter contains an ANI value. The switches add this ANI value to the ANI SPILL field in the call's CDR, unless they pull the ANI value from the Charge Number parameter.

—continued—

Table 8-21
RLT parameters in the first leg IAM (continued)

RLT parameter	Comments
Generic Digits	This parameter contains values for the following CDR fields: • BILLNUM, value from IAM • UNIVACC, value from IAM • PINDIGS, value from IAM • ACCTCD, value from IAM
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (see Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).
—end—	

3 The services platform returns an ACM to the remote switch. The ACM confirms that the services platform received the information needed to route the call to its destination. The remote switch passes the ACM to the bridging switch.

4 When the services platform answers the call, the platform sends an ANM to the remote switch. The remote switch formats and sends another ANM to the bridging switch.

5 The services platform identifies the called party and initiates the second leg of the call, formatting a new IAM and sending it to the remote switch. Because the trunk connecting the remote switch and the services platform supports RLT functionality, the IAM includes the Supplementary Line Information (SLI) parameter. Table 8-22 shows parameters in this IAM that affect RLT functionality.

Table 8-22
RLT parameters in the second leg IAM

RLT parameter	Comments
Called Party Number	The switches use the number of the party called when generating billing records. The switches place this value in the Called Number field of the CDR for the call. This parameter also provides an NOA value that indicates whether the call is operator-assisted or whether the switch must treat the call.
Charge Number	This parameter contains an ANI value. If the IAM contains this parameter, the switches add this value to the ANI SPILL field in the call's CDR. If the IAM does not contain this parameter, the switches get the ANI value from the Calling Party Number parameter.
Calling Party Number	This parameter contains an ANI value. The switches add this ANI value to the ANI SPILL field in the call's CDR, unless they pull the ANI value from the Charge Number parameter.
Generic Digits	This parameter contains values for the following CDR fields: • BILLNUM, value from IAM • UNIVACC, value from IAM • PINDIGS, value from IAM • ACCTCD, value from IAM

—continued—

Table 8-22
RLT parameters in the second leg IAM (continued)

RLT parameter	Comments
Supplementary Line Information (SLI)	This parameter causes a receiving switch to include a Call Reference parameter in an ACM when it responds. In this scenario, this parameter has an RLT Call Operation value.
Transit Network Selector	This parameter's Reorigination Call field identifies whether the call is a boomerang reorigination call (see Chapter 5, RLT call scenarios for ESP, for a description of boomerang reorigination). ***Note:*** The Transit Network Selector parameter includes the Reorigination Call field only in IAMs, and only when the switch has the Enhanced Reorigination for Operator Services feature (URLT0002).
—end—	

6 When it receives the IAM, the remote switch formats another IAM and sends it to the bridging switch. Because the trunk connecting the remote switch and the bridging switch supports RLT functionality, this IAM also includes the SLI parameter.

7 In response to the IAM with the SLI parameter, the bridging switch returns an ACM with a Call Reference parameter that identifies the second leg of the call. This ACM indicates that the terminating switch received the information that it needs to route the call.

8 The remote switch copies and saves the Call Reference parameter from the ACM. Then it changes the Call Reference in the ACM to contain the Call Reference information for the second leg of the call. The switch routes this ACM to the services platform, which also saves the Call Reference parameter.

9 When the terminating party of the second leg answers, the bridging switch formats an ANM and sends it to the remote switch. The remote switch passes the ANM to the services platform, connecting it in a three-way call with the calling party and called party.

10 The services platform initiates billing by sending a FAR message to the remote switch. Table 8-23 shows parameters in this FAR message that affect RLT functionality.

Table 8-23
RLT parameters in the Billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Start Billing Time value that the bridging switch uses.
Generic Digits	This parameter contains values for the following CDR fields: • BILLNUM, value from first FAR • UNIVACC, value from call setup • PINDIGS, value from call setup • ACCTCD, value from call setup
Operator Information	This parameter contains the ANM Billing Indicator set to either first or last.

11 The remote switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch.

12 The bridging switch also checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. In this scenario, the indicator starts billing.

Note 1: In this example, the services platform, remote, and bridging switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message's Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the bridging switch and the remote switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

13 To acknowledge that it received and processed the FAR message, the bridging switch formats an FAA message and sends it to the remote switch, which passes it to the services platform.

14 The services platform initiates release link trunking, sending another FAR message to the remote switch. Table 8-24 shows parameters in this FAR message that affect RLT functionality.

Note: A services platform or switch always sends a FAR message to the trunk circuit of the leg for which it does not have Call Reference information. In this scenario, the services platform sends the FAR message to the trunk of the call's first leg.

Table 8-24
RLT parameters in the third-party FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for 3rd Party Interaction Call value that the bridging switch uses.
Call Reference	This parameter holds the switch's call identification and point code values for a call. The bridging switch uses this information to bridge the correct two calls. ***Note:*** As each intermediate tandem switch passes this FAR message, it replaces this parameter's call identification and point code values with values received in an ANM or ACM.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.

—continued—

Table 8-24
RLT parameters in the third-party FAR message (continued)

RLT parameter	Comments
Calling Party Number	The switches, except bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform provided. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match OSRs on both the services platform and bridging switches. This parameter contains values for the following CDR fields: • BILLNUM, value from first FAR • UNIVACC, value from call setup • PINDIGS, value from IAM • ACCTCD, value from second FAR
—end—	

15 Using the information in the FAR message, the remote switch identifies the associated call (the second call leg). By examining the point codes for the trunks of each leg of the call, it also determines whether both legs connect to the bridging switch.

16 Because the point codes are the same, the remote switch retrieves the Call Reference information that it copied when it received the ACM from the bridging switch (see step 8). The remote switch adds this Call Reference information to a FAR message and sends the message to the bridging switch.

17 The bridging switch reads the message’s Facility Indicator and bridges the originating trunk of the first call leg to the terminating trunk of the second call leg. The bridging switch uses the information in the FAR message’s Call Reference parameter to identify the second leg.

18 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the remote switch, which passes it to the services platform.

19 After bridging the call, the bridging switch formats two REL messages and sends them to the remote switch to release the call connections for both call legs. The REL messages include Normal Clearing Cause Indicator parameters.

20 The remote switch sends two REL messages to the services platform and releases the call connections to the services platform and the corresponding trunks. It also sends two RLC messages back to the bridging switch to confirm the release of the first and second call legs. The RLC’s also include proper Cause Indicator parameters.

Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

21 The services platform also releases its connections and returns two RLC’s with proper Cause Indicator parameters to the remote switch to confirm the release of both call legs.

Figure 8-6
Message flow for third-party interaction scenario

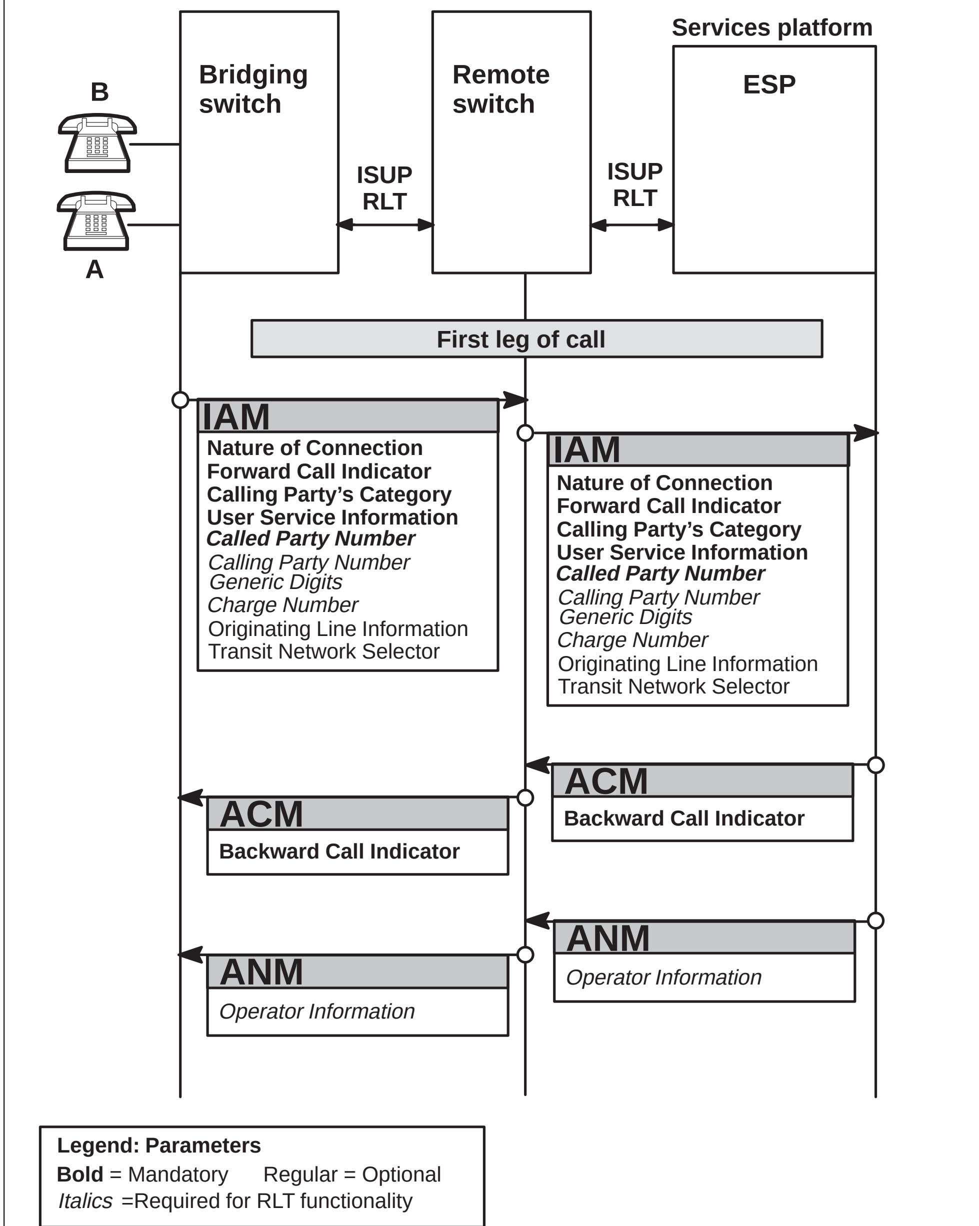

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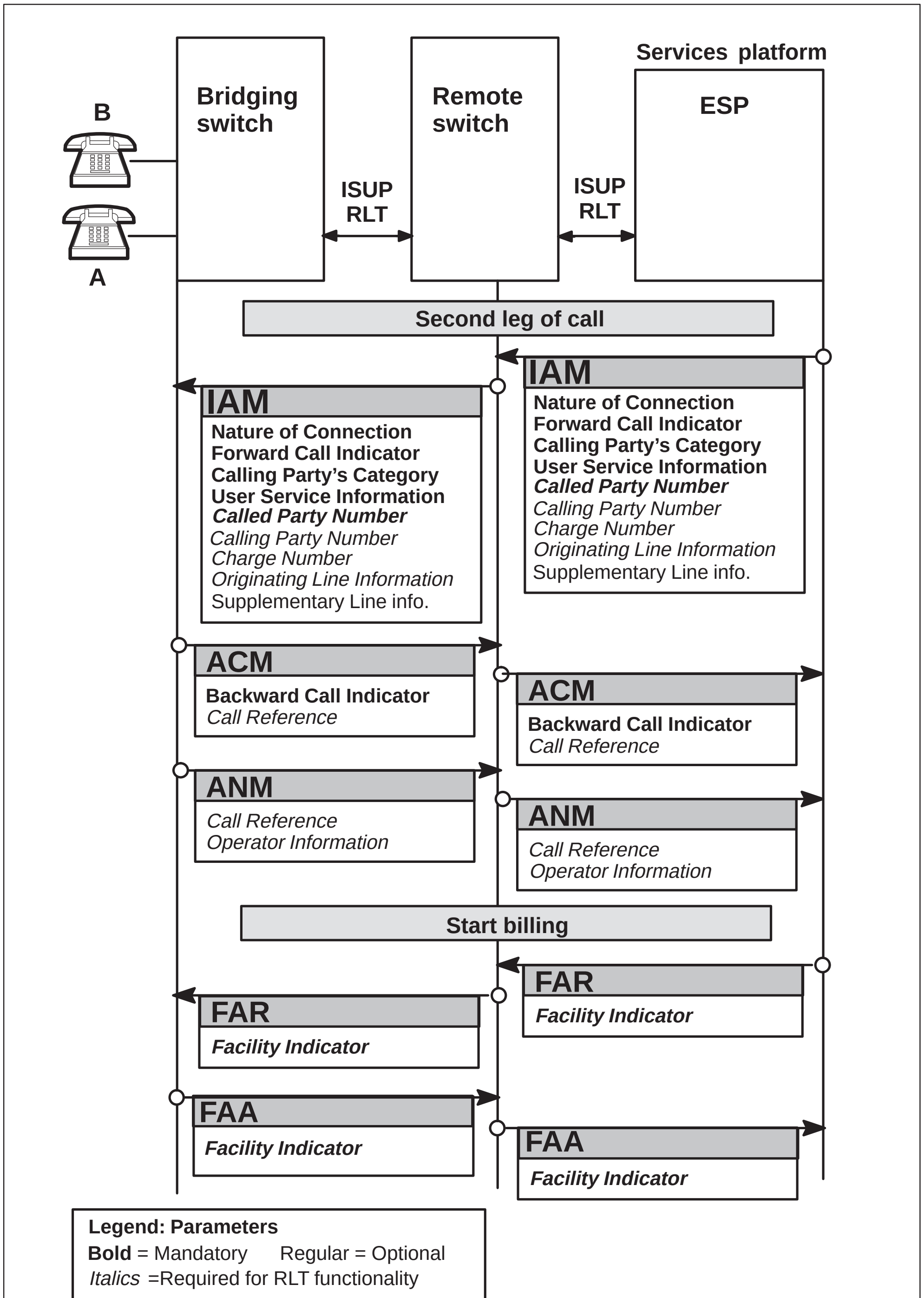
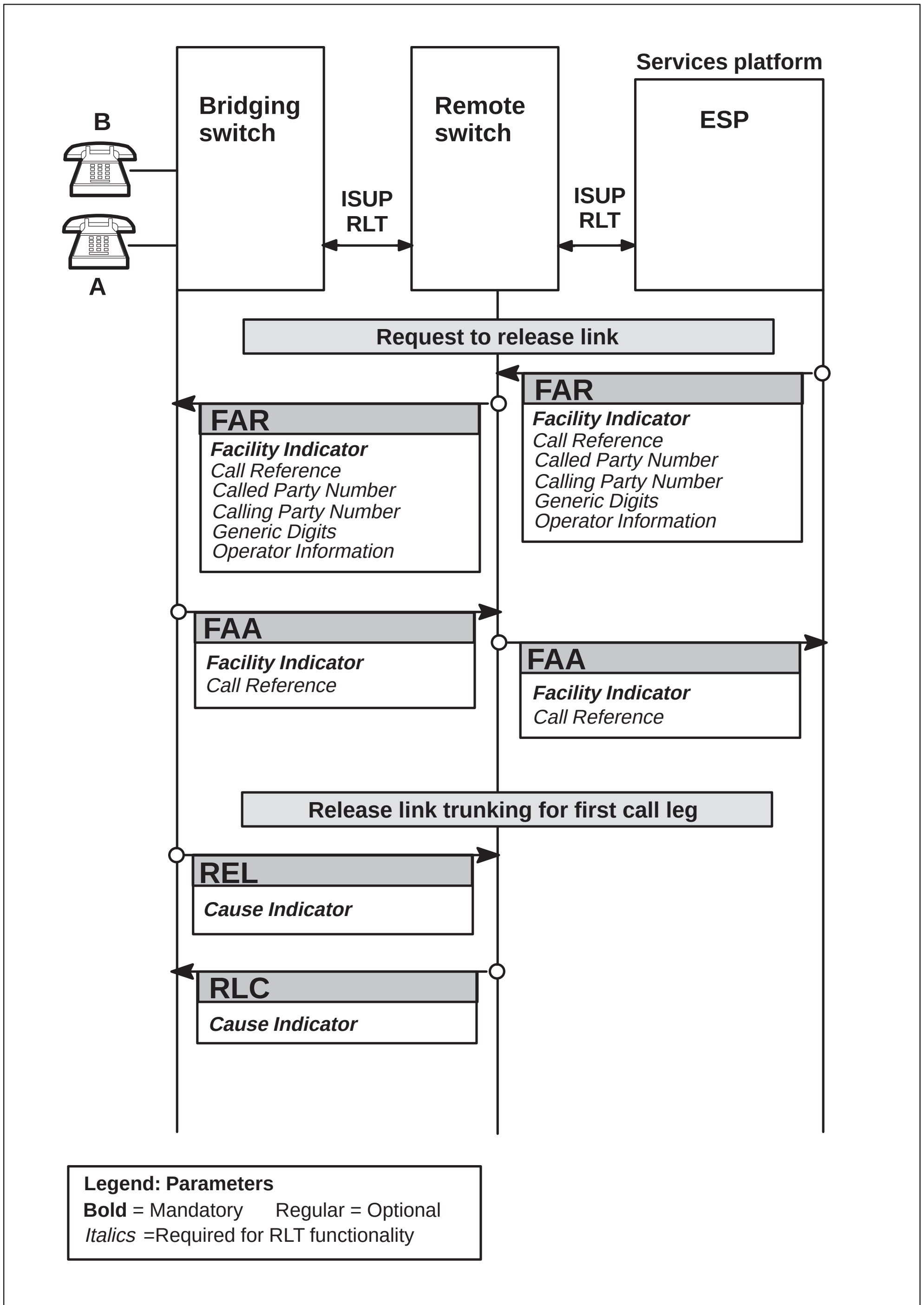
Figure 8-6
Message flow for third-party interaction scenario (continued)



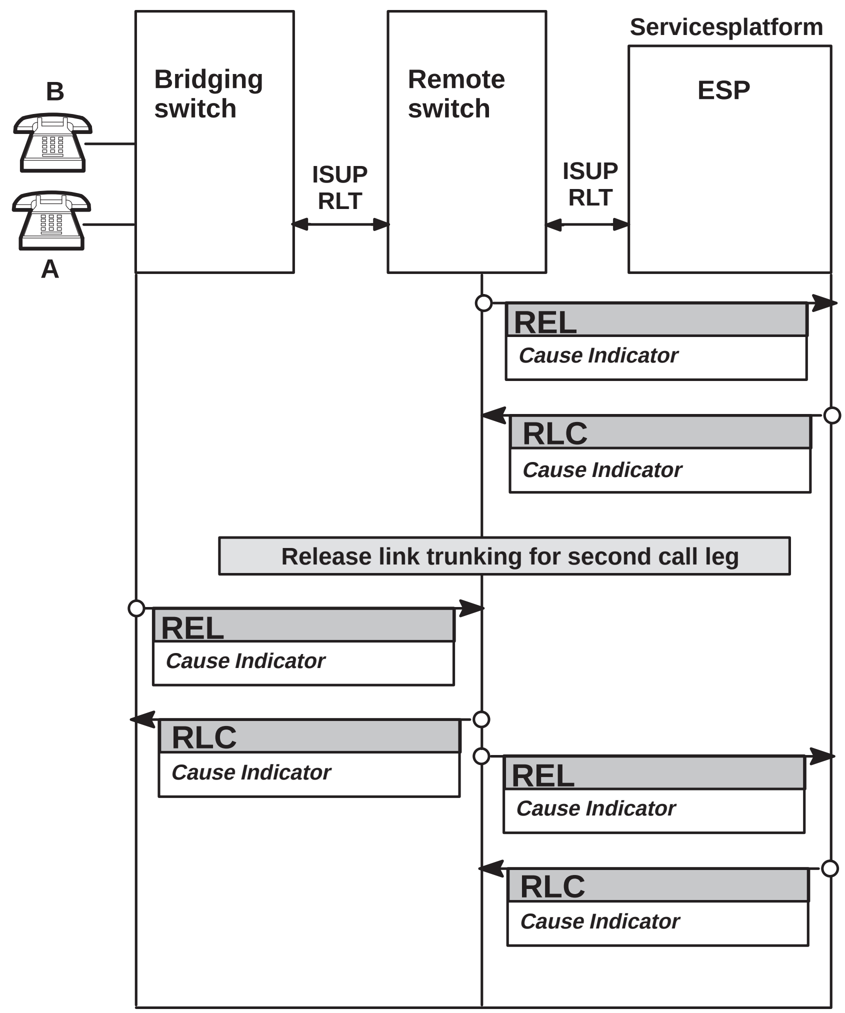
—continued—

Figure 8-6
Message flow for third-party interaction scenario (continued)



—continued—

Figure 8-6
Message flow for third-party interaction (continued)



Legend: Parameters
Bold = Mandatory Regular = Optional
Italics =Required for RLT functionality

—end—

Third-party interaction error scenario, bridging failure

This section explains the message flow for the third-party interaction scenario when, for whatever reason, a UCS DMS-250 switch or interconnecting trunk cannot perform the action requested in the Facility Indicator parameter of a FAR message. In this case, the switch involved does not perform the action requested (such as release link trunking), but may complete the call, depending on conditions. The error scenario is identical to the standard third-party interaction scenario up to step 9.

Message flow for third-party interaction error scenario

Figure 8-7 is a comprehensive message flow diagram for the third-party interaction error scenario. It shows the sequence for the exchange of messages between the bridging UCS DMS-250 switch, the remote UCS DMS-250 switch, and the services platform.

Specifically, the message exchange occurs as follows:

1 A switch, the bridging switch in this scenario, receives a call. The switches and services platform exchange messages just as in steps 1–9 in the standard third-party interaction scenario.

2 The services platform initiates billing by sending a FAR message to the remote switch. Table 8-25 shows parameters in this FAR message that affect RLT functionality.

Table 8-25
RLT parameters in the Billing FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the specific action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Start Billing Time value that the bridging switch uses.
Operator Information	This parameter contains the ANM Billing Indicator set to last.
Generic Digits	This parameter contains values for the following CDR fields: • BILLNUM, value from first FAR • UNIVACC, value from call setup • PINDIGS, value from call setup • ACCTCD, value from call setup

3 The remote switch checks the FAR message and determines that the trunk connecting the bridging switch and the remote switch supports RLT functionality. The remote switch then passes the FAR message to the bridging switch.

4 The bridging switch also checks the FAR message. It determines that the trunk that connects it to the switch from which it originally received the call is either a PTS trunk or an ISUP trunk that does not support RLT. This switch reads and performs the action designated in the FAR message's Facility Indicator parameter. In this scenario, the indicator starts billing.

Note 1: In this example, the services platform, remote, and bridging switches are the only switches in the scenario. In real cases, however, the scenario could involve a line of many switches. Each switch in the line checks whether the trunk connecting it to the switch from which it originally received a call supports RLT functionality. If so, it passes the FAR message to that switch. At some point in the line of switches, a switch connects to another switch across a trunk that does not support RLT functionality. That switch reads the FAR message's Facility Indicator parameter and performs the function that the parameter designates.

Note 2: For the same reason, if the trunk between the bridging switch and the remote switch in this scenario did not support release link trunking, the remote switch would not pass the FAR message, and would therefore be the bridging switch.

5 To acknowledge that it received and processed the FAR message, the bridging switch formats an FAA message and sends it to the remote switch, which passes it to the services platform.

6 The services platform sends another FAR message to the remote switch. This FAR message contains the ANM Billing Indicator set to first in the Operator Information parameter. Table 8-26 shows parameters in this FAR message that affect RLT functionality.

Note: A services platform or switch always sends a FAR message to the trunk circuit of the leg for which it does not have Call Reference information. In this scenario, the services platform sends the FAR message to the trunk of the call's first leg.

Table 8-26
RLT parameters in the first-leg third-party FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for 3rd Party Interaction Call value that the bridging switch uses.
Call Reference	This parameter holds the switch's call identification and point code values for a call. The bridging switch uses this information to bridge the correct two calls. ***Note:*** As each intermediate tandem switch passes this FAR message, it replaces this parameter's call identification and point code values with values received in an ANM or ACM.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.
Calling Party Number	The switches, except the bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the call's OSR.

—continued—

Table 8-26
RLT parameters in the first-leg third-party FAR message (continued)

RLT parameter	Comments
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the service platform provided. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match OSRs on both the services platform and bridging switches. This parameter contains values for the following CDR fields: • BILLNUM, value from first FAR • UNIVACC, value from second FAR • PINDIGS, value from call setup • ACCTCD, value from call setup
—end—	

7 Using the information in the FAR message, the remote switch identifies the associated call (the second call leg). By examining the point codes for the trunks of each leg of the call, it also determines whether both legs connect to the bridging switch.

8 Because the point codes are the same, the remote switch retrieves the Call Reference information that it copied when it received the ACM from the bridging switch. The remote switch adds this Call Reference information to a FAR message and sends the message to the bridging switch.

9 The bridging switch reads the message's Facility Indicator and bridges the originating trunk of the first call leg to the terminating trunk of the second call leg. The bridging switch uses the information in the FAR message's Call Reference parameter to identify the second leg.
Table 8-27 shows parameters in this FAR message that affect RLT functionality.

Table 8-27
RLT parameters in the billing second-leg third-party FAR message

RLT parameter	Comments
Generic Digits	This parameter contains values for the following CDR fields: • BILLNUM, value from IAM • UNIVACC, value from IAM • PINDIGS, value from second FAR • ACCTCD, value from second FAR

10 The UCS DMS-250 switch that attempted bridging returns a Facility Reject (FRJ) message to the remote switch to indicate that it could not perform the facility request. This message’s Cause Indicator parameter contains a Previous Billing Determination value. In this scenario, the switch cannot perform the action because the first/last Billing Indicator can only be set to a new value once. In this scenario, because this request has a higher priority than the primary request, the switch does not execute the primary request and rejects the FAR.

11 The services platform sends another FAR message to the remote switch. Table 8-28 shows parameters in this FAR message that affect RLT functionality.

Note: A services platform or switch always sends a FAR message to the trunk circuit of the leg for which it does not have Call Reference information. In this scenario, the services platform sends the FAR message to the trunk of the call’s first leg.

Table 8-28
RLT parameters in the third-party FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for 3rd Party Interaction Call value that the bridging switch uses.
Call Reference	This parameter holds the switch's call identification and point code values for a call. The bridging switch uses this information to bridge the correct two calls. ***Note:*** As each intermediate tandem switch passes this FAR message, it replaces this parameter's call identification and point code values with values received in an ANM or ACM.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.
Calling Party Number	The switches, except bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the call's OSR.

—continued—

Table 8-28
RLT parameters in the third-party FAR message (continued)

RLT parameter	Comments
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the OSR.
Generic Digits	This parameter contains the CALLID value that the services platform provided. The bridging switch places this value in the CALLID field in the OSR for the call and uses the value to match OSRs on both the services platform and bridging switches. This parameter contains values for the following CDR fields: • BILLNUM, value from first FAR • UNIVACC, value from second FAR • PINDIGS, value from call setup • ACCTCD, value from third FAR
—end—	

12 Using the information in the FAR message, the remote switch identifies the associated call (the second call leg). By examining the point codes for the trunks of each leg of the call, it also determines whether both legs connect to the bridging switch.

13 Because the point codes are the same, the remote switch retrieves the Call Reference information that it copied when it received the ACM from the bridging switch. The remote switch adds this Call Reference information to a FAR message and sends the message to the bridging switch.

14 The bridging switch reads the message's Facility Indicator and bridges the originating trunk of the first call leg to the terminating trunk of the second call leg. The bridging switch uses the information in the FAR message's Call Reference parameter to identify the second leg. Table 8-29 shows parameters in this FAR message that affect RLT functionality.

Table 8-29
RLT parameters in the billing second-leg third-party FAR message

RLT parameter	Comments
Generic Digits	This parameter contains values for the following CDR fields: • BILLNUM, value from IAM • UNIVACC, value from IAM • PINDIGS, value from second FAR • ACCTCD, value from second FAR

15 The switch that attempted bridging returns a Facility Reject (FRJ) message to the remote switch to indicate that it could not perform the facility request. This message's Cause Indicator parameter contains a Previous Billing Determination value. In this scenario, the switch cannot perform the action because the first/last Billing Indicator can only be set to a new value once. In this scenario, because this request has a higher priority than the primary request, the switch does not execute the primary request and rejects the FAR.

16 The services platform initiates release link trunking, sending another FAR message to the remote switch. Table 8-30 shows parameters in this FAR message that affect RLT functionality.

Note: A services platform or switch always sends a FAR message to the trunk circuit of the leg for which it does not have Call Reference information. In this scenario, the services platform sends the FAR message to the trunk of the call's first leg.

Table 8-30
RLT parameters in the third-party FAR message

RLT parameter	Comments
Facility Indicator	This parameter defines the action that the FAR message requests at the bridging or remote switch. In this scenario, this parameter contains a Release Link for 3rd Party Interaction Call value that the bridging switch uses.
Call Reference	This parameter holds the switch's call identification and point code values for a call. The bridging switch uses this information to bridge the correct two calls. ***Note:*** As each intermediate tandem switch passes this FAR message, it replaces this parameter's call identification and point code values with values received in an ANM or ACM.
Operator Information	This parameter provides information to the bridging switch, which places the information in the OPERNUMB, TRBLCODE, and ENTCODE fields in the OSR for the call.
Calling Party Number	The switches, except bridging switches, copy the value of this parameter to the CALLING NUMBER field in the OSR for the call. If the FAR message does not include the Calling Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the call's OSR.
Called Party Number	The remote switch copies the value of this parameter and adds it to the CALLED NUMBER field in the OSR for the call. If the FAR message does not include the Called Party Number parameter, the switch obtains billing information from the call's CDR and includes it in the OSR.
Generic Digits	This parameter contains values for the following CDR fields merged from both call legs: • BILLNUM, value from second FAR • UNIVACC, value from call setup • PINDIGS, value from IAM • ACCTCD, value from third FAR

17 Using the information in the FAR message, the remote switch identifies the associated call (the second call leg). By examining the point codes for the trunks of each leg of the call, it also determines whether both legs connect to the bridging switch.

18 Because the point codes are the same, the remote switch retrieves the Call Reference information that it copied when it received the ACM from the bridging switch. The remote switch adds this Call Reference information to a FAR message and sends the message to the bridging switch.

19 The bridging switch reads the message's Facility Indicator and bridges the originating trunk of the first call leg to the terminating trunk of the second call leg. The bridging switch uses the information in the FAR message's Call Reference parameter to identify the second leg.

20 To acknowledge that it received and processed the FAR message, the bridging switch sends an FAA message to the remote switch, which passes it to the services platform.

21 After bridging the call, the bridging switch formats two REL messages and sends them to the remote switch to release the call connections for both call legs. The REL messages include Normal Clearing Cause Indicator parameters.

22 The remote switch sends two REL messages to the services platform and releases the call connections to the services platform and the corresponding trunks. It also sends two RLC messages back to the bridging switch to confirm the release of the first and second call legs. The RLC's also include proper Cause Indicator parameters.

Note: A switch can perform release link trunking immediately after sending a REL message, even before receiving an RLC response.

23 The services platform also releases its connections and returns two RLC's with proper Cause Indicator parameters to the remote switch to confirm the release of both call legs.

Figure 8-7
Message flow for third-party interaction error scenario

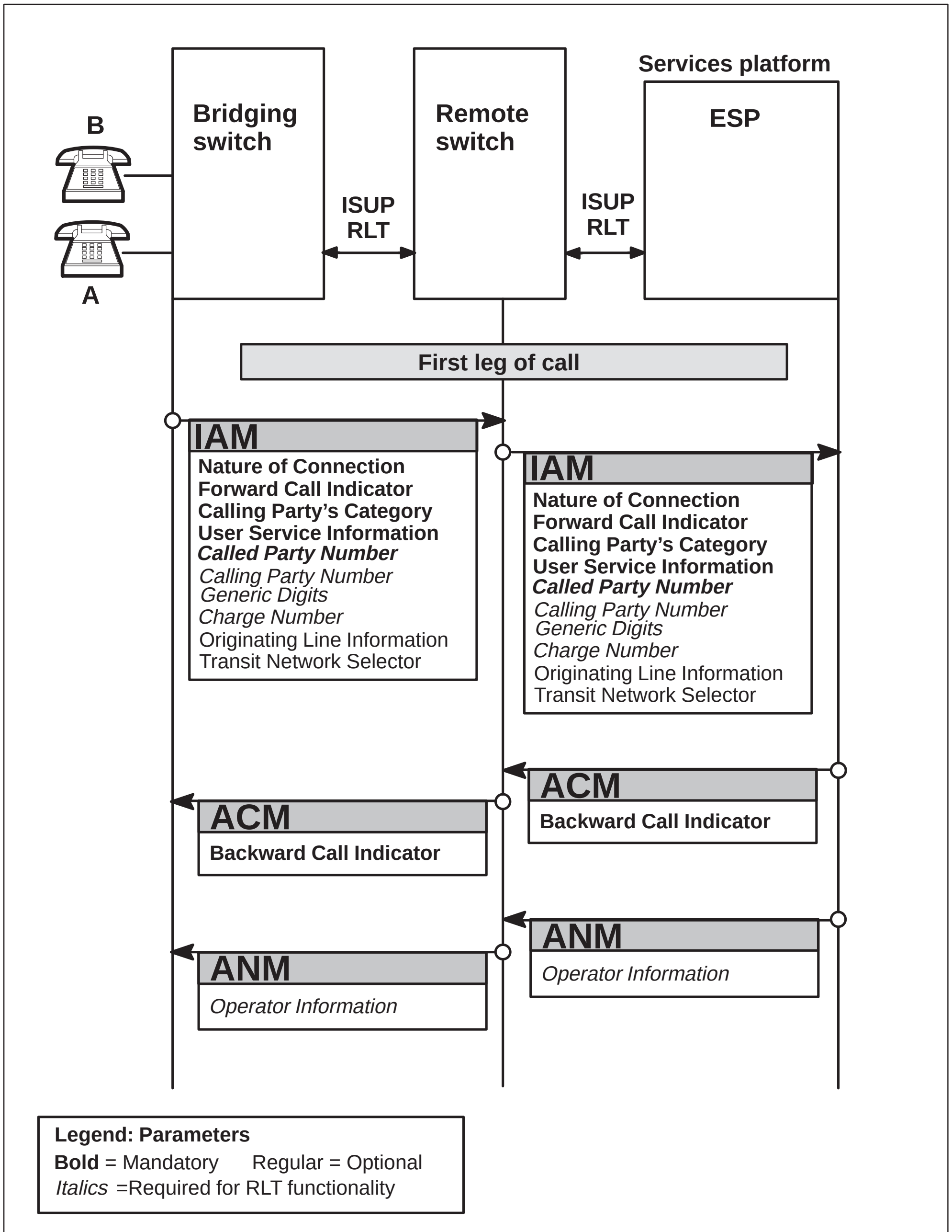


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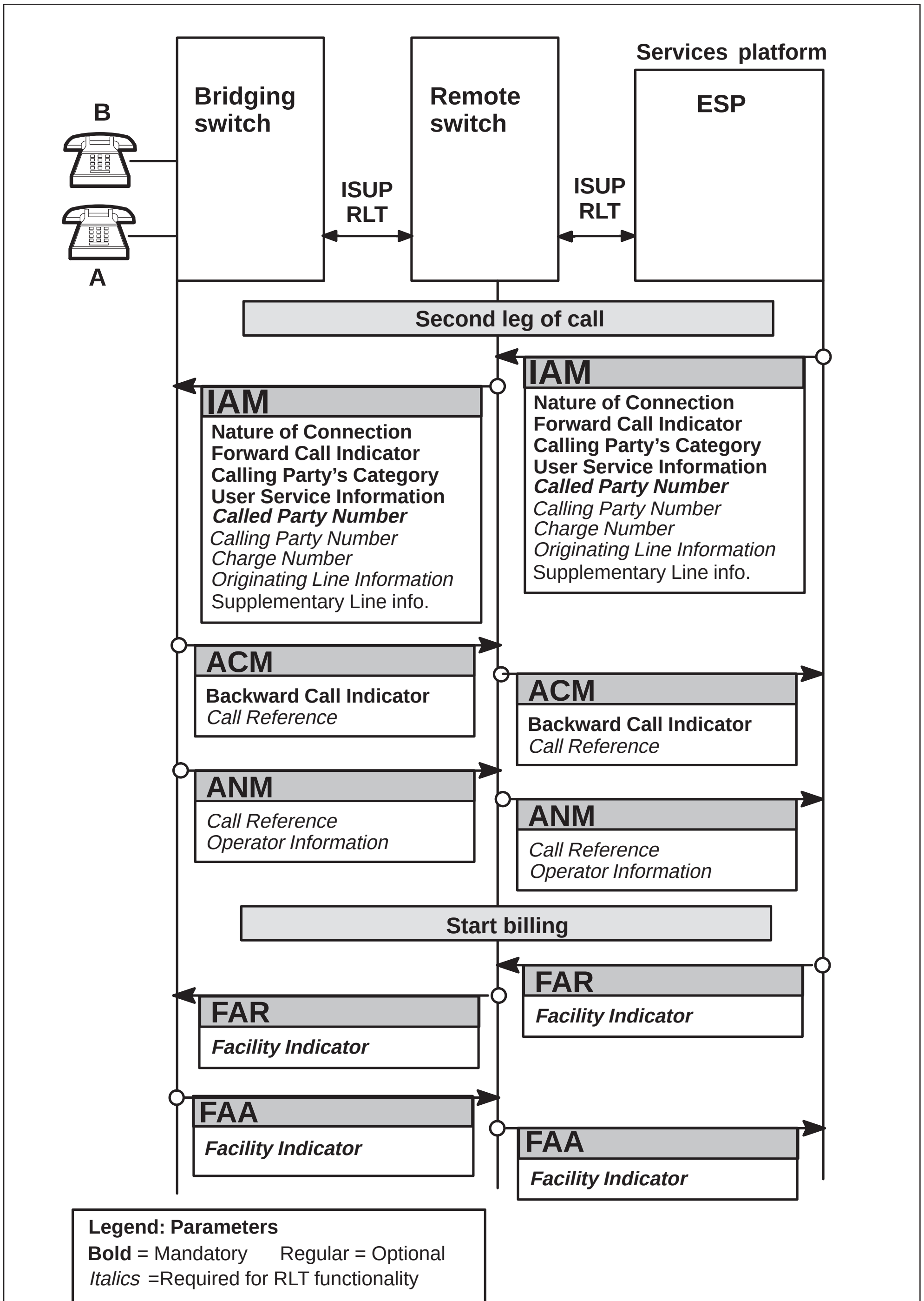
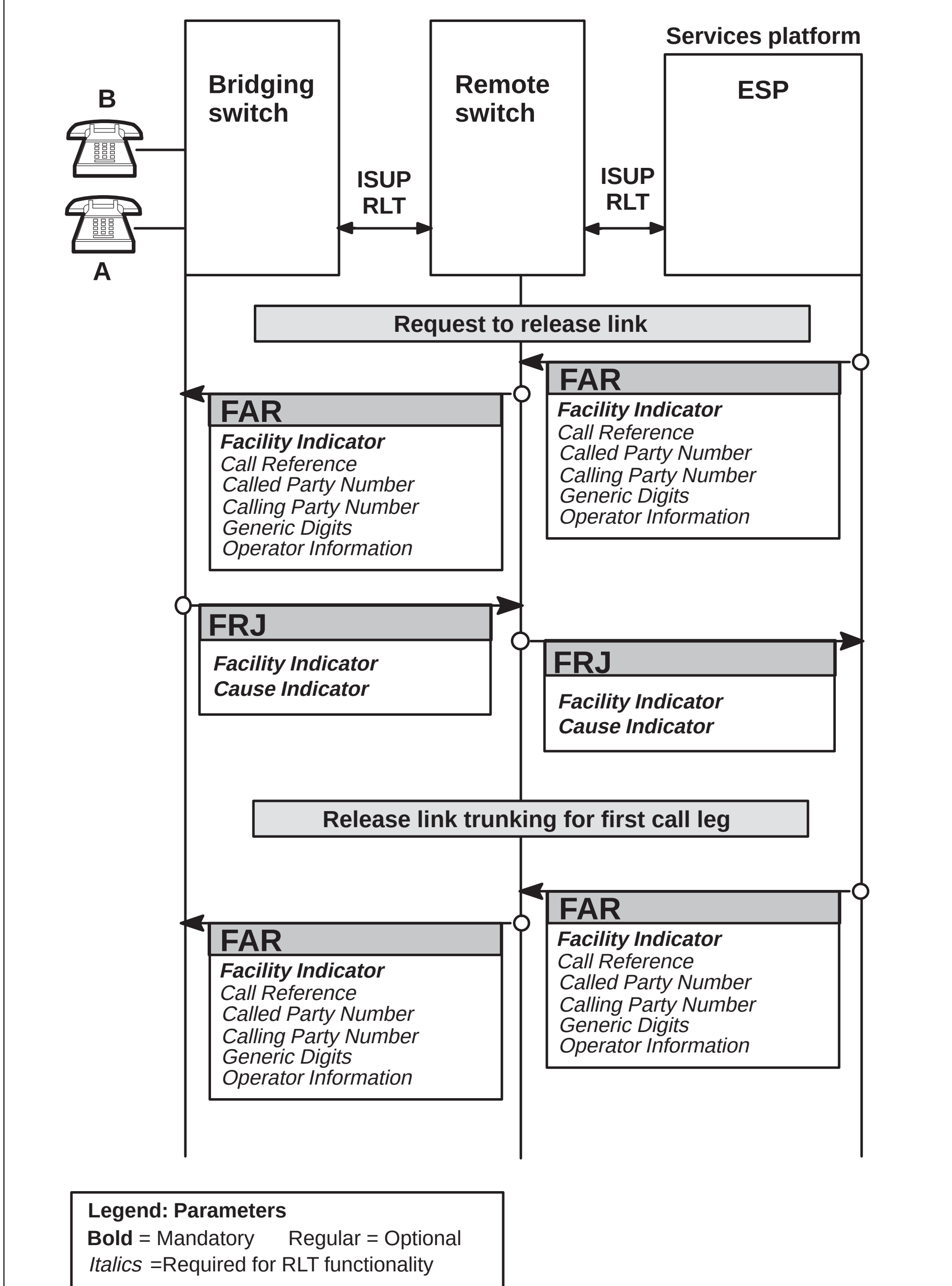
Figure 8-7
Message flow for third-party interaction error scenario (continued)



—continued—

Figure 8-7
Message flow for third-party interaction error scenario (continued)



—continued—

Figure 8-7
Message flow for third-party interaction error scenario (continued)

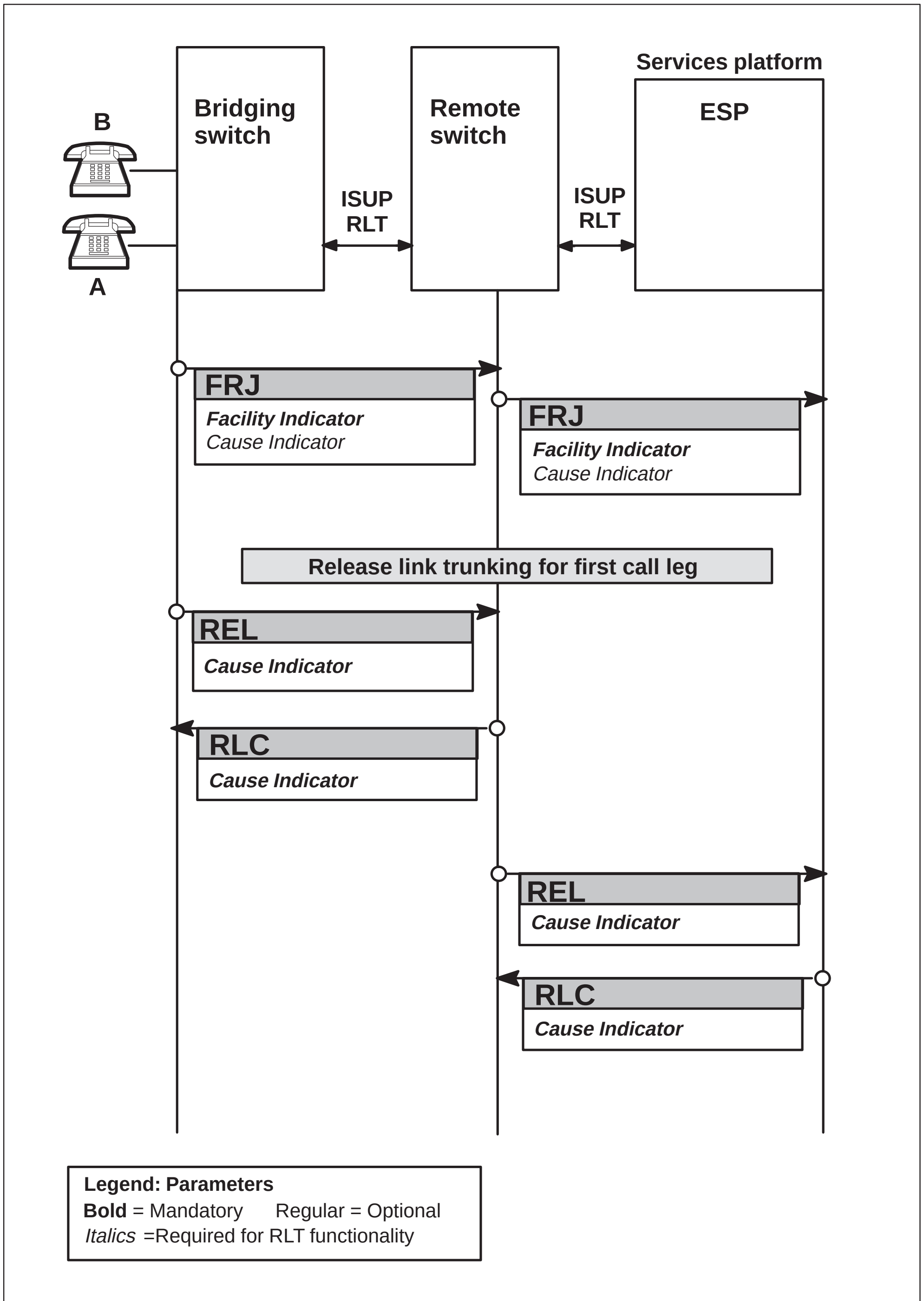


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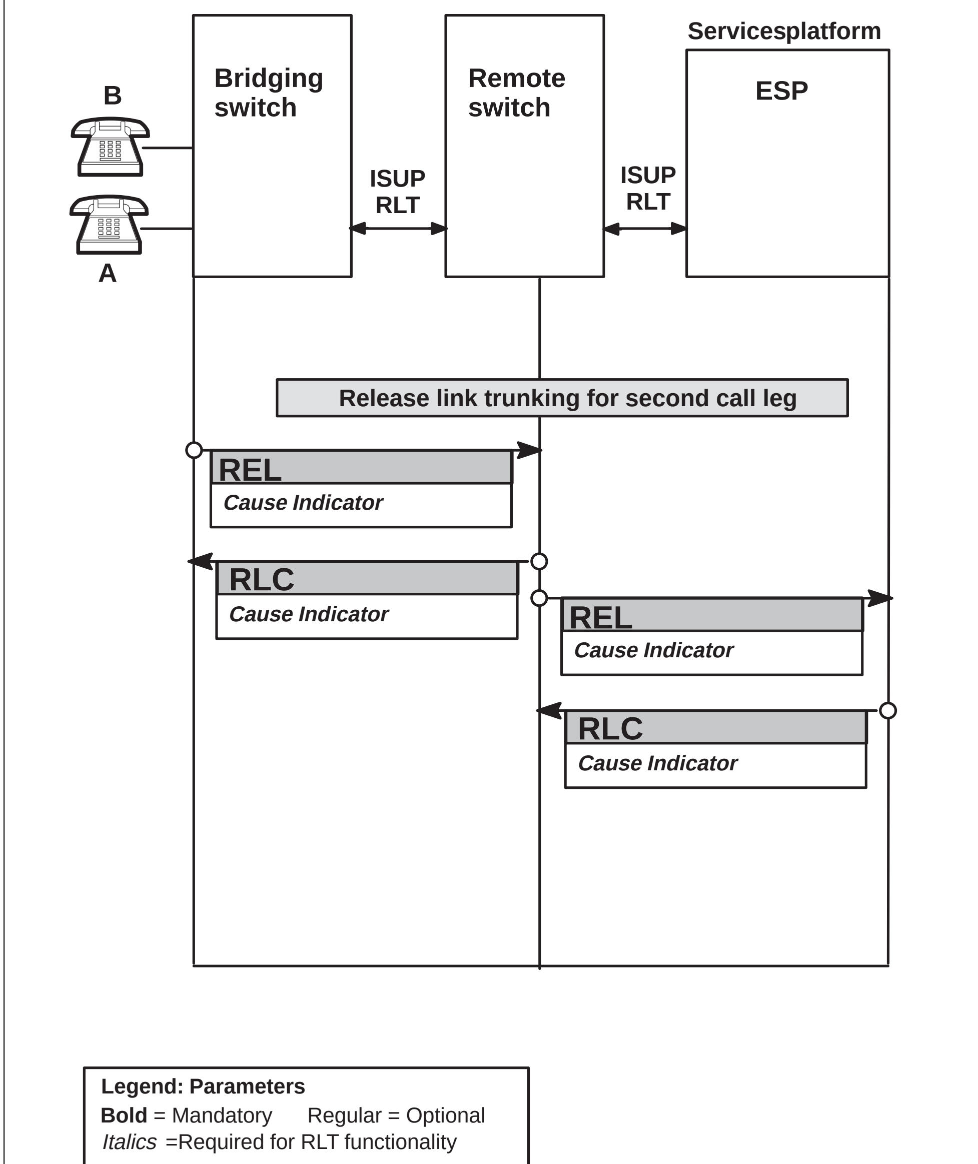
Figure 8-7
Message flow for third-party interaction error scenario (continued)



—end—

List of terms

ACD
automatic call distribution

ACIF
Authorization Code Identification Field

ACM
Address Complete Message

AIN
Advanced Intelligent Network

AMA
Automatic Message Accounting

ANI
automatic numbering identification

ANM
Answer Message

ATD
audio tone detector

bridge
connecting the originating or terminating trunk of one call to the terminating trunk of a second call

bridging switch
a switch that bridges calls and maintains the call connection

CAIN
Carrier Advanced Intelligent Network

CDR
call detail record

DAL
: direct-access line

DN
: directory number

DP
: detection point

DTMF
: dual-tone multifrequency

EAEO
: Equal Access End Office

EANT
: equal access network trunk

EDAL
: enhanced dedicated access line

EOPS
: Enhanced Operator Position System

ESP
: Enhanced Services Provider

ETN
: Electronic Tandem Network

FAA
: Facility Accept Message

FAR
: Facility Request Message

FCI
: Forward Call Indicator

FGB
: feature group B

FGC
: Feature Group C

FGD
: Feature Group D

FRJ
Facility Reject Message

GD
Generic Digits

GAP
Generic Address Parameter

GNCT
Generalized No Circuit

IAM
Initial Address Message

IEC
interexchange carrier

IMT
intermachine trunk

ISDN
Integrated Services Digital Network

ISUP
ISDN User Part

JIP
Jurisdiction Information Parameter

LNP
Local Number Portability

LRN
Local Routing Number

MCCS
Mechanized Calling Card Service

NOA
Nature of Address

non-operator call
call without a 0+ or 0– address

NSF
network-specific facilities

OA
operator-assisted

ONAL
off-net access line

ONAT
off-net access trunks

operator-initiated call
call initiated by services platform to both call parties

operator services call
call with a 0+ or 0– address

originating switch
Switch from which the first call leg starts

OSR
operator services record

PANI
pseudo-automatic numbering identification

PIC
point in call

POP
Point of Presence or Originating Switch

PRI
primary rate interface.

An interface that carries nB+D channels over a digital DS-1 facility (23B+D in North America and 30B+D in Europe). PRI is used to link private networking facilities, such as private branch exchanges (PBX), local area networks (LAN), and host computers with a standardized architecture acting as the bridge between private switching equipment and the public network. Formerly known as primary rate access.

PTS
per-trunk signaling

REL
Release

remote switch
UCS DMS-250 switch that receives the incoming call and routes the call to an RLT platform. A remote switch can also be a bridging switch. It does not necessarily have EOPS hardware, but it connects to an ESP or other services platform.

RLC
Release Complete

RLT
release link trunk

SCP
Service Control Point

SLI
Supplementary Line Information

SOC
Software Optionality Control

SS7
Signaling System 7

SSP
Service Switching Point

TDP
Trigger Detection Point

terminating switch
switch to which the call returns: the call's destination

TRKGRP
trunk group

TRKSGRP
trunk subgroup

TOPS
Traffic Operator Positioning System

UAC
universal access code

UCP

Universal Carrier Protocol

UCS

Universal Carrier Services

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Digital Switching Systems

UCS DMS-250

SS7 RLT Feature Application Guide

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