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**3RD GENERATION
PARTNERSHIP
PROJECT 2
"3GPP2"**

User Selective Call Forwarding

Revision: 1

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Note

This specification is an extract of the post-ballot version of TIA PN-4551-A.

CELLULAR RADIOTELECOMMUNICATIONS INTERSYSTEM
OPERATIONS

TIA/EIA-41-D Based Network Enhancements for
User Selective Call Forwarding (USCF)

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FOREWORD

This Interim Standard contains recommendations for supporting the wireless subscriber feature “User Selective Call Forwarding (USCF)”.

The *ANSI/TIA/EIA-41-D* recommendation upon which this Interim Standard builds is:

- *TIA/EIA-41-D Cellular Radiotelecommunications Intersystem Operations; Telecommunications Industry Association; 1997.*

ASSUMPTIONS

The following items are basic understandings used during the development of this document:

- a. USCF shall permit authorized subscribers to redirect incoming calls to:
 - the subscriber’s network based voice mail box.
 - a network registered USCF DN.
 - one of a selection of termination addresses which are stored in the mobile station.
- b. USCF shall permit authorized subscribers to identify the redirection destination of incoming calls, independent of authorization for other call forwarding features (e.g., Call Forwarding Default [CFD], Call Forwarding Busy [CFB] and Call forwarding No Answer [CFNA]).
- c. USCF shall not permit identifying special access numbers as the redirection destination for incoming calls (e.g., Emergency Services [e.g., 9-1-1], Operator Services [e.g., 0+], Service Codes [e.g., N-1-1], or to the subscriber’s MDN).
- d. The network shall reject a request for USCF diversion to an MS-provided number if an MS-provided number does not accompany that request.
- e. The network shall use a USCF subscriber identified number as the destination for USCF diversion if that number accompanies an authorized request for USCF diversion to an MS-provided number.
- f. USCF subscribers authorized for Variable Registration may register a network registered USCF DN via feature code (e.g., *FC + # + termination address + SEND). A second or subsequent registration shall overwrite the previous network registered USCF DN.
- g. Requests for USCF diversion to an MS-provided number may need to be authenticated (e.g., by a unique challenge).
- h. If digits are sent to the network by an MS when the MS is instructed by the user to invoke a form of USCF, the only digits sent are a prestored digit string associated to the form of USCF being invoked; this includes a diversion number for USCF diversion to an MS-provided number. The contents of the MS’s buffers are not sent or modified.

- i. The USCF feature is applicable to all supporting 3G (or later) mobile stations and air interfaces. The applicability of USCF invocation to earlier or other non-compatible air-interfaces is not addressed.
- j. The mobile station shall not offer USCF as an option to the user unless the System to which the MS is registered supports USCF. Additionally, the mobile station shall not offer USCF as an option when alerting an idle subscriber unless the air interface currently in use supports the signaling needed for USCF invocation for incoming calls to idle subscribers.
- k. A serving network notifies served MSs that it supports USCF so that MSs can determine when USCF may be offered as an option to the subscriber.

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EDITORIAL KEY

- a. *ANSI-41-D, ANSI-124-B or ANSI-664-A* totally new sections are identified via text with right hand margin "diffmarks", as:
 A totally new section's text.
- b. *ANSI-41-D, ANSI-124-B or ANSI-664-A* new enhanced text is identified via text with "under-score" lines and right hand margin "diffmarks", as:
 . . existing text new enhanced text existing text. . .
- c. *ANSI-41-D, ANSI-124-B or ANSI-664-A* deleted existing text is identified via text with "strike-through" lines and right hand margin "diffmarks", as:
 . . existing text ~~deleted text~~ existing text . .
- d. *ANSI-41-D, ANSI-124-B or ANSI-664-A* new enhanced text is identified via text with "double under-score" lines and right hand margin "diffmarks" when another standard modifies the same section, as:
 . . existing text new enhanced text other standard's text existing text. . .

REVISION HISTORY

| Revision | Date | Remarks |
|----------|------------|----------------------|
| 1.0 | July, 2000 | Initial publication. |
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1. INTRODUCTION

1.1 OBJECTIVE

This Interim Standard (IS) presents Stage-1 (new chapter *TIA/EIA-664-B*), Stage-2 (*TIA/EIA-41.3-D* enhancements), and Stage-3 (*TIA/EIA-41.5-D* and *TIA/EIA-41.6-D* enhancements) recommendations for supporting the User Selective Call Forwarding (USCF) feature use in the Wireless Radiotelephone Service.

1.2 SCOPE

This document specifies the wireless intersystem network operation enhancements required for supporting roaming subscribers with the User Selective Call Forwarding (USCF) feature.

1.3 ORGANIZATION

This document is organized as per *TIA/EIA-41-D* and *TIA/EIA-664-A*.

2. REFERENCES

2.1 Normative References

TIA/EIA:

- *ANSI/TIA/EIA-41-D Cellular Radiotelecommunications Intersystem Operations*; Telecommunications Industry Association; December 1997.
- *ANSI/TIA/EIA-124-B Wireless Radio Telecommunications Intersystem Non-Signaling Data Communication DMH (Data Message Handler)*; Telecommunications Industry Association; July 1999.
- *TIA/EIA-IS-664 Cellular Features Description* Telecommunications Industry Association; January 1996.

3. **TIA/EIA-664-XXX “CELLULAR FEATURE DESCRIPTIONS” MODIFICATIONS**

This section provides the Stage-1 feature description for User Selective Call Forwarding (USCF) according to the structure of *TIA/EIA-664*.

3.1 **Definitions**

(*TIA/EIA-664-001-B*, page 4)

Switch Control Code (SCC)

A Switch Control Code consists of a terminating “*” preceded by the one, two, or three digits of a Switch Control Value (as in: SCV*).

Switch Control Code String (SCCS)

A Switch Control Code String is a digit string consisting of a Switch Control Code followed by a termination address (as in SCV* + termination address).

Switch Control Value (SCV)

A Switch Control Value is an integer in the range (0...255) that is used by an MS, either alone or in conjunction with a Termination Address, to control elements of the operation of certain MSC-based features.

Depending on the details of the air interface in use, an SCV may be sent by the MS to the network:

- As a Switch Control Code (constructed from the SCV) sent using the air interface’s procedures for sending generic digit strings to the network, or
- Using dedicated air interface specific protocol elements.

In either case, the SCV is always represented as an SCC when sent from MSC to MSC within the TIA/EIA-41 network.

Depending on the details of the air interface in use, an SCV and associated termination address may be sent by the MS to the network:

- As a Switch Control Code String (with the SCC portion of the SCCS constructed from the SCV) sent using the air interface’s procedures for sending generic digit strings to the network, or
- Using dedicated air interface specific protocol elements.

In either case, the SCV and associated termination address are always represented as an SCCS when sent from MSC to MSC within the TIA/EIA-41 network.

The following table defines the Switch Control Values used in this Standard:

| Switch Control Values | Usage |
|-----------------------|--|
| 0 | Forward the incoming call to a network registered destination |
| 16 | Forward the incoming call to the destination provided by the mobile in conjunction with this code. |
| 17 | Forward the incoming call to voice mail. |
| 18 | Apply Answer Hold treatment to the incoming call (assuming an incoming call is being offered to the MS through Alerting or Call Waiting Notification). |

Table X: Switch Control Value Assignments

User Selective Call Forwarding (USCF)

See User Selective Call Forwarding.

4.2 Call Model

(TIA/EIA-664-XXX-B, page 20)

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| The omitted existing text is retained without modification. |
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The following subscriber (and other party) actions are defined:

- A. **Address:** A subscriber presses the **SEND** key with termination address digits.
- C. **Conferee:** A conferee requests a disconnect.
- D. **Disconnect:** The other party (sometimes a calling party) requests a disconnect.
- E. **End:** A subscriber presses the **END** key.
- F. **Feature:** A subscriber enters a Feature Code String followed by the **SEND** key.
- G. **callinG:** The calling party sends one or more DTMF digits.
- H. **Held:** The held party requests a disconnect.
- I. **Incoming:** An incoming call arrives for a subscriber.
- N. **aNswers:** The other party answers.
- P. **Period:** A time period expires.
- S. **Send:** A subscriber presses the **SEND** key without digits.
- T. **Third:** The third party requests a disconnect.
- U. **featUre code:** A subscriber enters a Feature Code String, a delimiter digit “#,” and a termination address followed by the **SEND** key
- V. **addressedscV:** The subscriber instructs the MS to send an SCV and associated termination address, to the network.
- W. **sWitch control:** The subscriber instructs the MS to send an SCV to the network.

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Note: the omitted existing text is retained without modification.

The following tables summarize the feature interactions in a state-action matrix for the features in this Standard:

| Action | 1 Idle | 2 Alerting | 3 2-way | 4 Adding on | 5 Holding 2-way | 6 3-way | 7 2-way CW notification | 8 2-way CW | 9 Conference adding on | 10 Conference 2-way | 11 Conference |
|---|------------------|----------------------|--------------------------|-----------------------|---------------------------|-------------------|-----------------------------------|----------------------|----------------------------------|-------------------------------|-------------------------|
| Address and send | Basic | Basic CC | CT= 3WC | CT= 3WC | CT 3WC | 3WC | CW | CW | CC | CC | CC |
| Conferee disconnect | N/A | CC | N/A | N/A | N/A | N/A | N/A | N/A | CC | CC | CC |
| other party Disconnect | N/A | Basic | Basic | N/A | N/A | 3WC | CW | CW | N/A | CC | N/A |
| End key | Basic | Basic | Basic | CT= 3WC | CT 3WC | CT 3WC | CW | CW | CC | CC | CC |
| Feature code and send | Basic Feature CC | Basic CC | Basic CC CCW MWN Feature | CC CCW MWN Feature | CT 3WC | 3WC | CW | CW | CC | CC | CC |
| callinG DTMF digits | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Held disconnect | N/A | Basic | N/A | CC CT= 3WC | CT= 3WC | N/A | N/A | CW | N/A | N/A | N/A |
| Incoming call | Basic | Basic | Basic CW | CC CT= 3WC | CT= 3WC | 3WC | CW | CW | CC | CC | CC |
| other party aNswers | N/A | N/A | Basic | N/A | CT= 3WC | 3WC | N/A | N/A | N/A | CC | CC |
| Period | N/A | Basic | Basic | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Send and no digits | Basic | Basic CC | Basic CC CT= 3WC | CT= 3WC | CT 3WC | 3WC | CW | CW | CC | CC | CC |
| Third disconnect | N/A | N/A | N/A | N/A | CT= 3WC | 3WC | CW | N/A | N/A | N/A | N/A |
| featUre code, termination address and send | Basic CC | Basic CC | CT= 3WC CC | CT= 3WC CC | CT 3WC | 3WC | CW | CW | CC | CC | CC |
| addressed scV | N/A | USCF | N/A | N/A | N/A | N/A | USCF | N/A | N/A | N/A | N/A |
| sWitch control | N/A | USCF | N/A | N/A | N/A | N/A | USCF | N/A | N/A | N/A | N/A |

Table 3: State-Action Matrix to Locate Feature Interactions (Part 1 of 2)

X.1 User Selective Call Forwarding (USCF)

(new Chapter for TIA/EIA-664-XXX-B)

User Selective Call Forwarding (USCF) provides a called subscriber the capability to selectively redirect unanswered, incoming calls to an alternate destination (e.g., to a voice mail system, to a network registered USCF DN, or to a DN stored in the Mobile Station (MS)). USCF is applicable both to calls being offered to a subscriber via alerting and to calls being offered to a subscriber via Call Waiting Notification.

USCF subscribers may base a decision to invoke USCF on any consideration they deem appropriate (e.g., the time of day, their location, the activities in which they are engaged, etc.). USCF called subscribers also authorized for calling party information presentation features (e.g., Calling Number Identification Presentation [CNIP], Calling Name Presentation [CNAP], etc.) may redirect incoming calls to different DNs based on the received calling party's identity.

USCF subscribers are capable of redirecting incoming calls to an alternate destination DN independent of their authorization status for other redirection features (e.g., Call Forwarding Busy (CFB), Call Forwarding Default (CFD), Call Forwarding No Answer (CFNA), etc.).

Applicability to Telecommunications Services

USCF is applicable to switched, circuit mode telecommunications services.

X.1.1 Normal Procedures With Successful Outcome

Authorization

USCF may be generally available or may be provided after pre-arrangement with the service provider. The authorization may have the following subscription options:

Table 1.1a USCF Subscription Options

| Subscription Options | Values |
|----------------------|--|
| Registration | Network Variable. Subscribers are authorized to register their network registered USCF DN. |
| | Network Fixed. Forward-to a network registered USCF DN determined upon authorization. |
| | MS Variable. Subscribers are authorized to register their MS stored DNs. |
| | Voice Mail. Forward to the voice mail address of the subscriber. |

De-Authorization

USCF may be withdrawn at the subscriber's request or for administrative reasons.

Registration

If the subscriber is authorized for Network Variable, an initial network registered USCF DN is registered at authorization by the subscriber. A second or subsequent Network Variable registration shall overwrite the previous network registered USCF DN. If the Network Variable registration is accepted, the system shall indicate success with feature confirmation treatment. If the Network Variable registration fails, the system may indicate failure with feature denial treatment.

If the subscriber is authorized for Network Fixed, the network registered USCF DN shall be registered upon authorization.

Storage in the MS of MS stored USCF DNs is left to MS implementation.

The voice mail address shall be registered upon authorization for USCF to voice mail subscribers.

De-Registration

USCF shall be de-registered upon de-activation by the home service provider.

Activation

USCF shall be activated upon authorization.

De-Activation

USCF shall be de-activated upon de-authorization.

Invocation

USCF may be invoked when there is an unanswered incoming call while the USCF called subscriber is being alerted (i.e., idle MS receiving Alerting treatment).

USCF may be invoked when there is an unanswered incoming call while the called USCF subscriber is active in a call (i.e., MS receiving Call Waiting [CW] treatment).

Normal Operation With Successful Outcome

The following tables describe call party actions and system reactions for USCF.

Table 1.1b: USCF Invocation from the Alerting State

| | State Alerting | Condition | The called USCF mobile station is in the alerting state for an incoming call delivery. |
|------------|---|------------------|--|
| XID | Call Party Action | | System Reaction |
| 2W 2 | The called subscriber invokes voice mail USCF using an MS specific procedure (e.g., causing the MS to send the SCV of 17 to the network using an air interface specific mechanism). | | The calling party is redirected to the called USCF subscriber's voice mail system. Go to the Idle state. |
| 2W 3 | The called subscriber invokes Network Fixed or Network Variable USCF using an MS specific procedure (e.g., causing the MS to send the SCV of 0 to the network using an air interface specific mechanism). | | The calling party is redirected to the network registered USCF DN. Go to the Idle state. |
| 2V 1 | The called subscriber invokes MS Variable USCF using an MS specific procedure (e.g., causing the MS to send the SCV of 16 and associated termination address to the network using an air interface specific mechanism). | | The calling party is redirected to the MS stored USCF DN. Go to the Idle state. |

Table 1.1c: USCF Invocation from 2-Way Call Waiting Notification State

| | State 2-way call waiting notification | Condition | The called USCF subscriber is in a two-way conversation with the other party and call waiting notification is applied. |
|------------|---|------------------|--|
| XID | Call Party Action | | System Reaction |
| 7W 2 | The called USCF subscriber invokes USCF voice mail (e.g., causing the MS to send the SCV of 17 to the network using an air interface specific mechanism). | | The calling party is redirected to the called USCF subscriber's voice mail system. Go to the 2-way state. |
| 7W 3 | The called USCF subscriber invokes Network Fixed or Network Variable USCF (e.g., causing the MS to send the SCV of 0 to the network using an air interface specific mechanism). | | The calling party is redirected to the network registered USCF DN. Go to the 2-way state. |
| 7V 1 | The called USCF subscriber invokes MS Variable USCF (e.g., causing the MS to send the SCV of 16 and associated termination address to the network using an air interface specific mechanism). | | The calling party is redirected to the MS stored USCF DN. Go to the 2-way state. |

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Call Detail Record

The system should record call detail information for the following:

- a. Network based USCF registration activities and events.
- b. USCF invocation events.
- c. USCF Forward-to call leg usage (e.g., duration, number).

See *ANSI-124* for the specific information to be included for each element.

X.1.2 Exception Procedures or Unsuccessful Outcome

Registration

If the subscriber is not authorized for the request, or if the forward-to number is not acceptable, the system may apply feature denial treatment when registration is attempted.

The system should not accept forward-to numbers to the operator (0- or 0+), service codes (N11), police, fire or similar agencies, or a revertive call.

De-Registration

None identified.

Activation

None identified.

De-Activation

None identified.

Invocation

If the USCF redirected call cannot be routed to the forwarded-to destination, then the call should be given the appropriate treatment, such as applying the Special Information Tone for intercept to the calling party.

If the USCF invocation is rejected based on lack of USCF authorization, the invoking user should be informed using service rejection indications. The mobile station ALERT state or the Call Waiting Notification state should remain until the mobile station user takes an alternate action (e.g., answer the call) or the call is otherwise disconnected.

Precautions should be taken to preclude undesirable looping of USCF forwarded numbers within the MSC or between the MSC and other switching centers. If such looping is detected, the call forwarding should be given the appropriate treatment, such as applying the Special Information Tone for intercept to the calling party.

Exceptions While Roaming

If the System to which the MS is registered does not support USCF, the mobile station display shall not indicate USCF as an available option.

Exceptions During Intersystem Handoff

If handoff to a system that does not support USCF occurs while the mobile station is being alerted, the mobile station display shall not indicate USCF as an available option for that call while that system remains the Serving System.

X.1.3 Alternate Procedures

None identified.

X.1.4 Interactions With Other Cellular Services

Advice Of Charge (AOC) (Future)¹

None identified.

Answer Holding (AH) (Future)¹

None identified.

Call Delivery (CD)

None identified.

Call Forwarding—Busy (CFB)

None identified.

Call Forwarding—Default (CFD)

None identified.

Call Forwarding—No Answer (CFNA)

None identified.

¹This feature is not currently defined. This description retained to describe an intent of feature interaction.

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Call Forwarding—Unconditional (CFU)

None identified.

Call Transfer (CT)

None identified.

Call Waiting (CW)

CW is invoked before USCF. That is, calls arriving to a subscriber who is able to receive a second call (e.g., no other call is waiting to be answered), shall be presented to the subscriber with CW notification. The called subscriber may then invoke USCF.

Calls arriving to a subscriber who is unable to receive a second call (e.g., another call is waiting to be answered), shall not be presented to the subscriber. The call shall be provided the appropriate default busy treatment (e.g., CFB, CFD, busy tone).

Calling Name Presentation (CNAP)

Once alerted (or upon being notified of a waiting call), the called USCF subscriber may invoke USCF immediately, whether or not CNAP has been delivered.

Calling Name Restriction (CNAR)

If the called (redirecting) subscriber invokes USCF with either the CNAR mode Permanently Restricted or the CNAR Default is Presentation Restricted, the redirecting name shall indicate *presentation restricted* to prevent the called subscriber's name presentation to the forward-to party or to the forward-to station.

Calling Number Identification Presentation (CNIP)

Once alerted (or upon being notified of a waiting call), the called USCF subscriber may invoke USCF immediately, whether or not CNIP has been delivered.

Calling Number Identification Restriction (CNIR)

If the called (redirecting) subscriber invokes USCF with either the CNIR mode Permanently Restricted or the CNIR Default is Presentation Restricted, the redirecting number shall indicate *presentation restricted* to prevent the called subscriber's number presentation to the forward-to party or to the forward-to station.

Conference Calling (CC)

None identified.

Do Not Disturb (DND)

DND takes precedence over USCF. A call to a subscriber with both USCF and DND active shall be given DND treatment immediately and USCF does not apply.

Emergency Services (Future)¹

None identified.

Flexible Alerting (FA)

Interaction between FA and USCF is beyond the scope of this Standard.

Message Waiting Notification (MWN)

None identified.

Mobile Access Hunting (MAH)

Interaction between MAH and USCF is beyond the scope of this Standard.

Password Call Acceptance (PCA)

None identified.

Preferred Language (PL)

None identified.

Priority Access and Channel Assignment (PACA)

PACA affects USCF. A call to a subscriber waiting for a PACA channel is considered to be busy, USCF does not apply.

Remote Feature Control (RFC)

None identified.

Selective Call Acceptance (SCA)

None identified.

Subscriber PIN Access (SPINA)

None identified.

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Subscriber PIN Intercept (SPINI)

None identified.

Three-Way Calling (3WC)

None identified.

User Selective Call Forwarding (USCF)

Not applicable.

Voice Message Retrieval (VMR)

None identified.

Voice Privacy (VP)

None identified.

1 SYSTEM FUNCTIONALITY

(TIA/EIA-664-801-1)

The purpose of this section is to define the characteristics of the system with respect to messages and indications to the Mobile Station (MS) and to the calling party.

The omitted existing text is retained without modification

1.5 Indications Applied Toward the Mobile Station

(new for TIA/EIA-664-801-3)

The following indications may be applied by the system toward the mobile station during normal operation and in providing the features in this Standard, as:

- a. . . .
- b. System support for User Selective Call Forwarding.

4. **TIA/EIA-41-D Chapter 1 “Functional Overview” Modifications**

4 SYMBOLS AND ABBREVIATIONS

(TIA/EIA-41-D Chapter 1, page 1-14)

USCF User Selective Call Forwarding

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5. TIA/EIA-41-D Chapter 3 “Automatic Roaming Information Flows” Modifications

6.x User Selective Call Forwarding

(new for TIA/EIA-41-D Chapter 3)

This section depicts the interactions between network entities in various situations related to automatic roaming and User Selective Call Forwarding (USCF). These scenarios are for illustrative purposes only.

6.X.1 Downloading USCF relevant profile when MS is registered in serving system

(new for TIA/EIA-41-D Chapter 3)

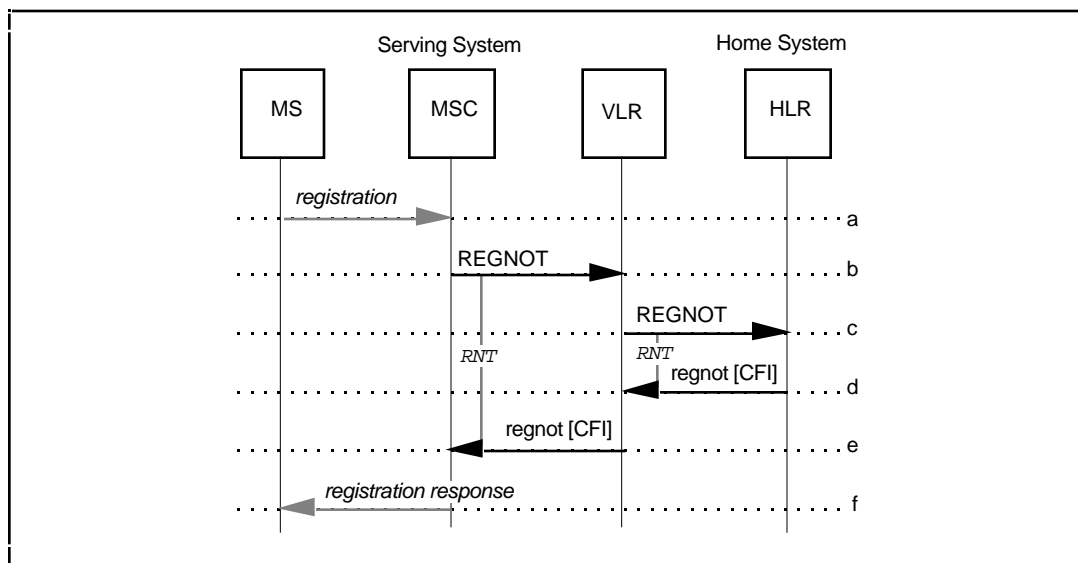


Figure 6.x.1 Downloading USCF relevant profile when MS is registered in serving system

- a. An MS registers in a new serving system.
- b. The serving MSC sends a REGNOT to the VLR requesting validation and profile.
- c. The VLR forwards the REGNOT to the HLR.
- d. The HLR returns to the VLR a regnot including the CallingFeaturesIndicator set to indicate the feature activity statuses associated for USCF.

| Parameters | Usage | Type |
|------------|--|------|
| CFI | Indicates which USCF subscription options are authorized and active. | R |

- e. The VLR forwards the regnot to the MSC
- f. The MSC provides a registration response to the MS.

6.X.2 Variable Registration of a Network Registered USCF DN

(new for *TIA/EIA-41-D* Chapter 3)

This scenario describes variable registration for a network registered USCF DN. The information flow is the same as CFD's in Section 5.5.1.

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6.X.3 USCF to Network Determined Destination Invocation

(new for TIA/EIA-41-D Chapter 3)

This scenario describes call forwarding to a network registered USCF DN or to voice mail based on the subscriber invoking USCF during alerting.

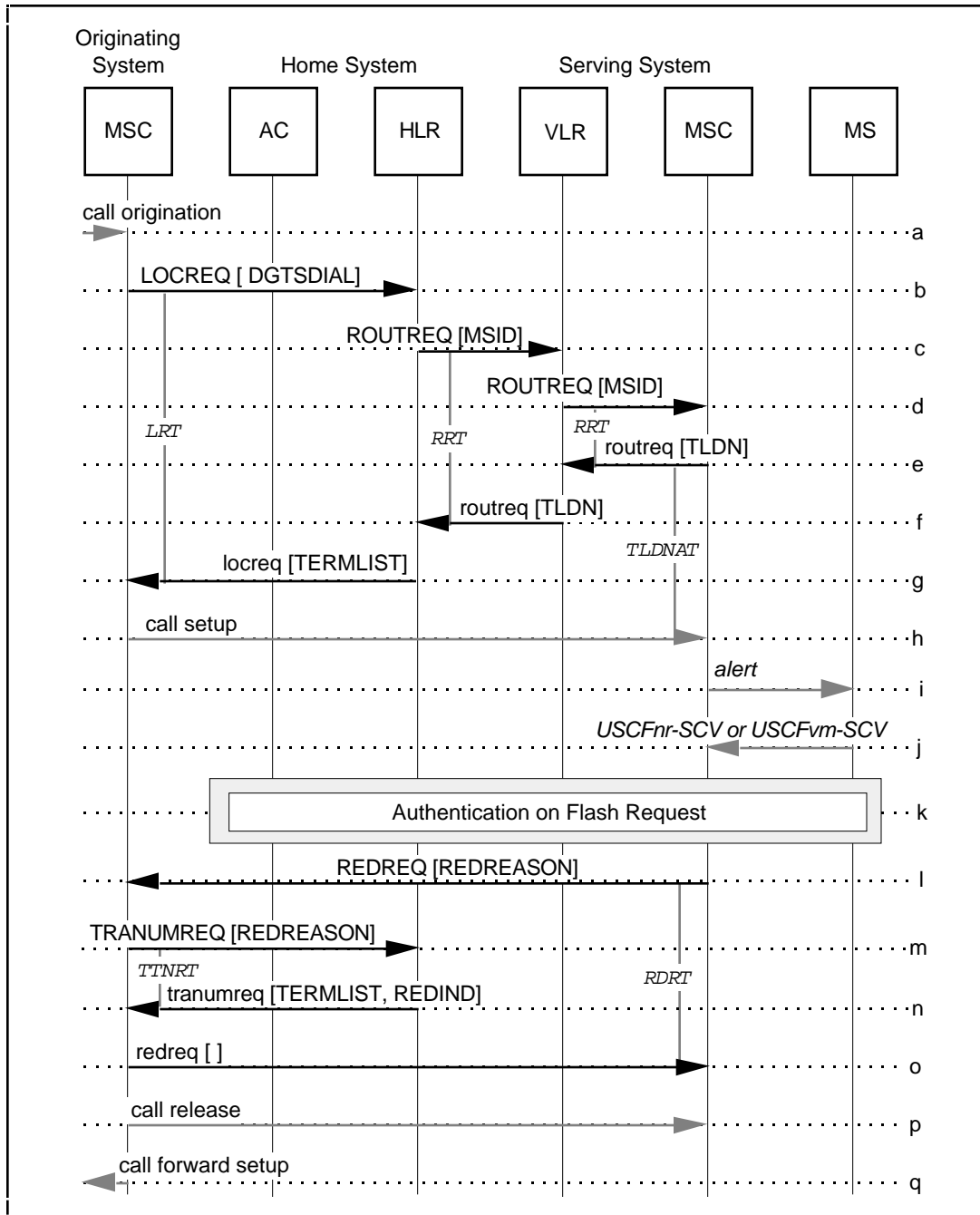


Figure 6.x.3 USCF to Network Determined Destination Invocation

- a. A call to the roaming USCF subscriber arrives at the Originating MSC.
- b. The Originating MSC sends a LOCREQ to the HLR associated with the MS; this association is made through the dialed MS address digits contained in the Digits (Dialed) parameter.

- c. The HLR sends a ROUTREQ to the VLR where the MS is registered.
- d. The VLR sends a ROUTREQ to the Serving MSC.
- e. The Serving MSC allocates a TLDN and returns that TLDN to the VLR in the routreq.
- f. The VLR sends the routreq to the HLR.
- g. The HLR returns a locreq to the Originating MSC. The locreq includes the TLDN (in the TerminationList parameter), along with an indication of the reason for extending the incoming call (i.e., for CD) in the DMH_RedirectionIndicator parameter.
- h. The Originating MSC sets up a voice path to the Serving MSC using the TLDN in the locreq and the protocols defined by the interconnection method.
- i. The MS is alerted.
- j. The called subscriber responds to the call by using an MS specific USCF operation to initiate call forwarding, either to a network registered USCF DN or to voice mail. The MS uses an air interface specific mechanism to send the appropriate SCV, either the USCFnr-SCV (value 0) or the USCFvm-SCV (value 17), towards the MSC.
- k. The Serving MSC recognizes that USCFnr or USCFvm has been invoked. The Serving MSC may initiate the Authentication on FlashRequest process, see scenario 5.4.5. If so, for the purposes of this scenario, it is assumed that authentication is successful.
- l. The Serving MSC sends a REDREQ to the Originating MSC, indicating the subscriber's request that the call be redirected to the network registered DN (or to voice mail).

| Parameters | Usage | Type |
|------------|--|------|
| REDREASON | Indicates the forwarding type selected by the MS user, USCFnr or USCFvm. | R |

Note: Optionally the Serving MSC may send the HLR a TRANUMREQ for redirection from the serving system rather than sending the REDREQ to the Originating MSC.

- m. The Originating MSC is able to redirect the call, and it sends a TRANUMREQ to the HLR requesting routing information appropriate for the condition indicated in the RedirectionReason parameter.
- n. The HLR sends the tranumreq to the Originating MSC, including the appropriate routing information in the TerminationList parameter, along with an indication of the reason for extending the incoming call in the DMH_RedirectionIndicator parameter.

| Parameters | Usage | Type |
|------------|--|------|
| TERMLIST | Includes the network registered USCF DN to which the call should be redirected or instructions on routing to voice mail. | R |
| REDIND | Indicates redirection to the network registered USCF DN or to voice mail. | O |

- o. The Originating MSC sends a redreq to the Serving MSC.
- p. The Originating MSC releases the inter-MSC call.

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- q. The Originating MSC initiates call forwarding using the information specified in the received TERMLIST parameter.



6.x.4 USCF with MS Stored Termination Address Invocation

(new for TIA/EIA-41-D Chapter 3)

This scenario describes call forwarding to an MS stored USCF DN; without global challenge (AUTH = 0).

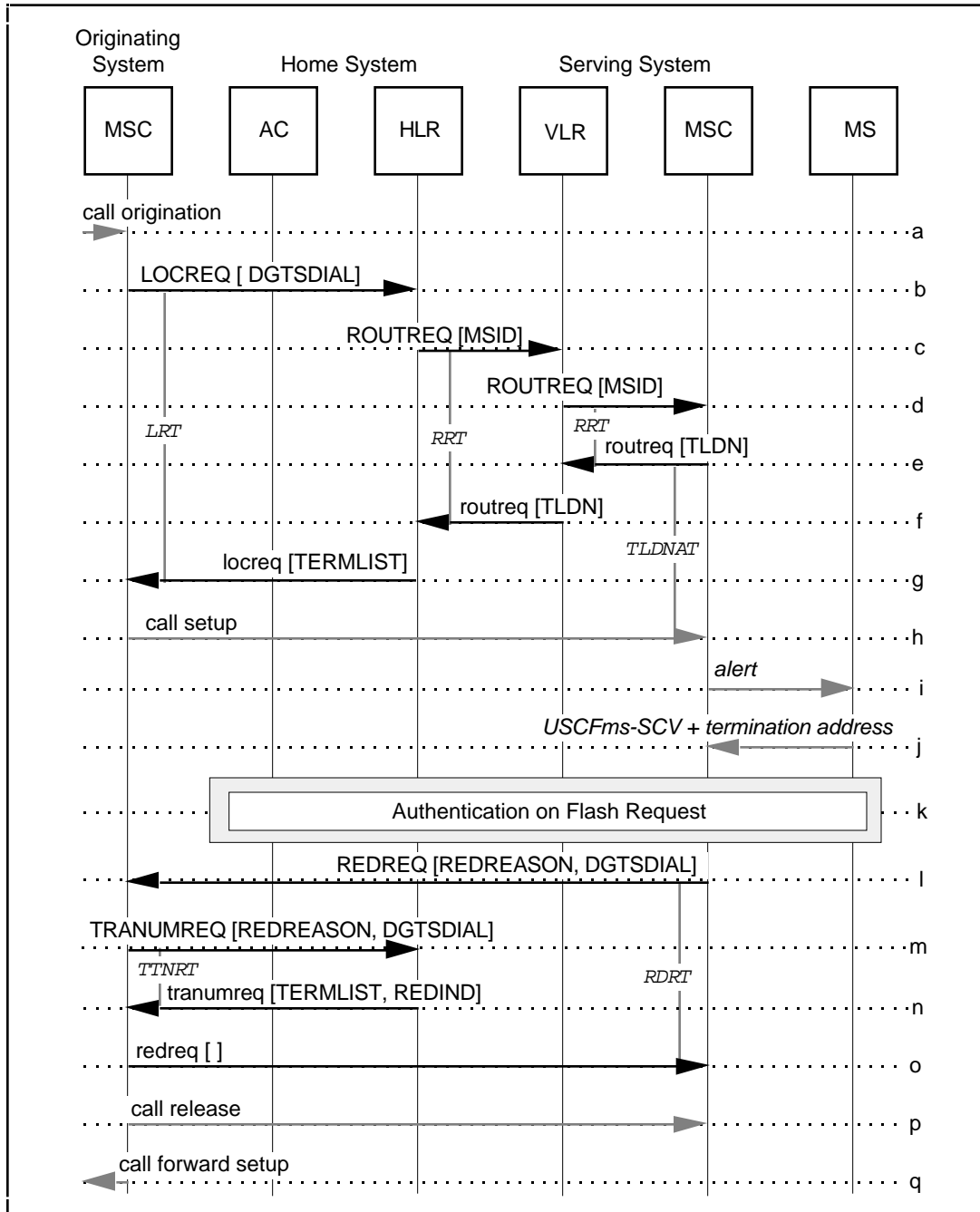


Figure 6.x.4 USCF with MS Stored Termination Address Invocation

- a-i. Same as USCF, Section 6.x.3, Step a-i.
- j. The called subscriber responds to the call by initiating an MS specific USCF operation to initiate call forwarding to an MS stored USCF DN. The MS uses

an air interface specific mechanism to send the USCFms-SCV (value 16) in conjunction with a termination address towards the MSC.

- k. The Serving MSC recognizes that USCFms has been invoked. The Serving MSC may initiate the Authentication on FlashRequest process, see scenario 5.4.5. If so, for the purposes of this scenario, it is assumed that authentication is successful.
- l. The Serving MSC sends a REDREQ to the Originating MSC, indicating that the subscriber requested the call be redirected to the MS-provided termination address.

| Parameters | Usage | Type |
|------------|--|------|
| REDREASON | Indicates the forwarding type selected by the MS user, USCFms. | R |
| DGTSDIAL | Includes the termination address received from the MS. | R |

Note: Optionally the Serving MSC may send the HLR a TRANUMREQ for redirection from the serving system rather than sending the REDREQ to the Originating MSC.

- m. The Originating MSC is able to redirect the call, and it sends a TRANUMREQ to the HLR requesting routing information appropriate for the condition indicated in the RedirectionReason parameter. The TRANUMREQ contains the Digits (Dialed) parameter received in the REDREQ.
- n. The HLR sends the tranumreq to the Originating MSC, including the appropriate routing information in the TerminationList parameter, along with an indication of the reason for extending the incoming call in the DMH_RedirectionIndicator parameter.

| Parameters | Usage | Type |
|------------|--|------|
| TERMLIST | Includes the destination address (derived from the MS-provided termination address) to which the call should be redirected . | R |
| REDIND | Indicates redirection to an MS-provided termination address. | O |

- o. The Originating MSC sends a redreq to the Serving MSC.
- p. The Originating MSC releases the inter-MSC call.
- q. The Originating MSC initiates call forwarding using the information specified in the received TERMLIST parameter.

6.X.5 USCF Interaction with CW

(new for TIA/EIA-41-D Chapter 3)

This scenario describes call forwarding to a network registered USCF DN or voice mail invocation for an authorized USCF subscriber with CW active.

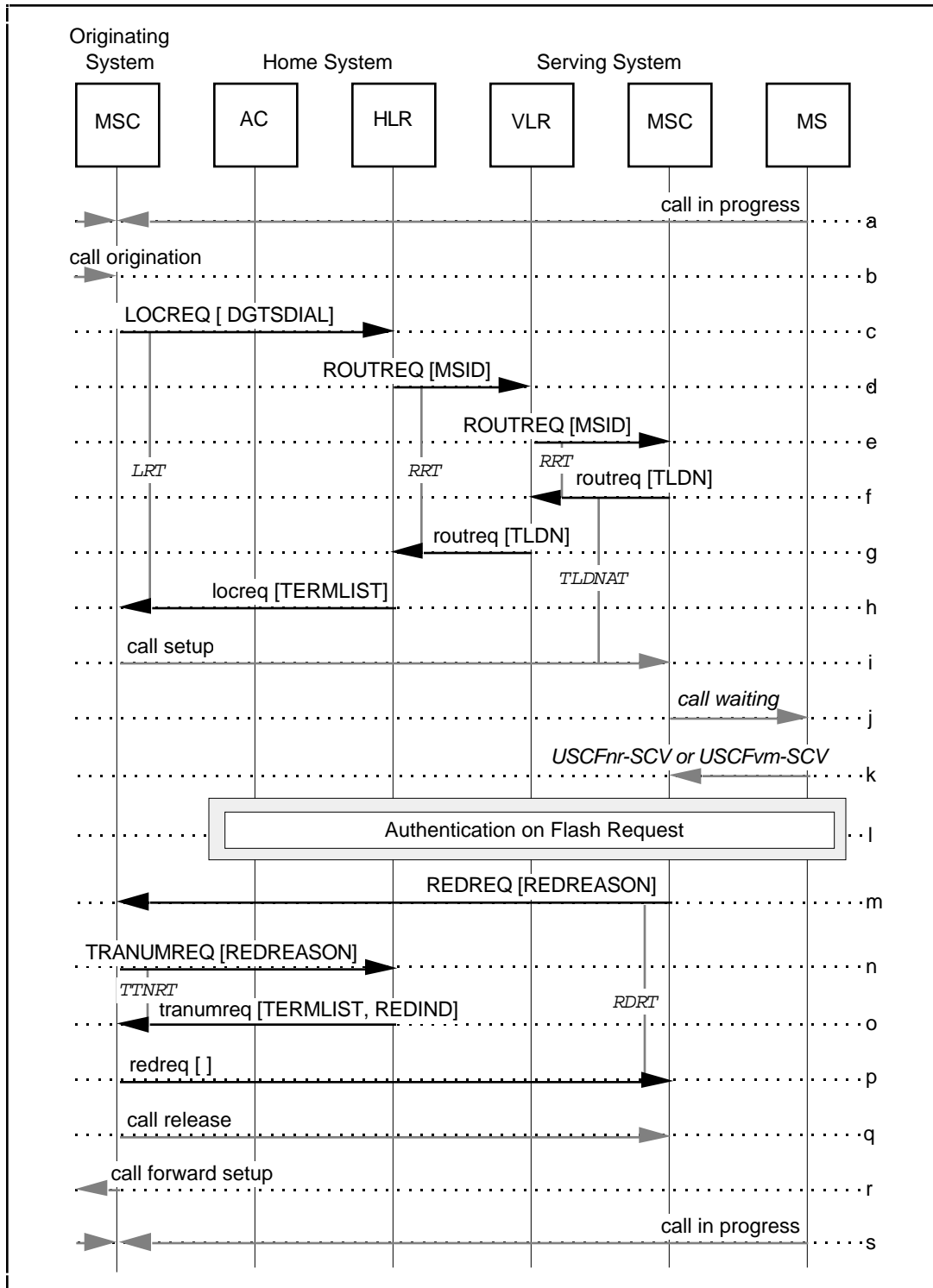


Figure 6.x.5 USCF Interaction with CW

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- a. A call involving a served USCF subscriber is in progress.
- b-i. Same as USCF, Section 6.x.3, Step a-h.
- j. When the inter-MSC call is received at the Serving MSC, the Serving MSC recognizes that the called subscriber is busy with an in progress call, and the Serving MSC then applies Call Waiting treatment to the Call Waiting authorized MS.
- k-r. Same as USCF, Section 6.x.3, Step j-q.
- s. The in progress call continues without further impact.

6.X.6 USCF Invocation After Handoff

(new for TIA/EIA-41-D Chapter 3)

This scenario describes call forwarding to an MS stored USCF DN when call delivery plus alerting occurs before handoff and USCF activation occurs after handoff.

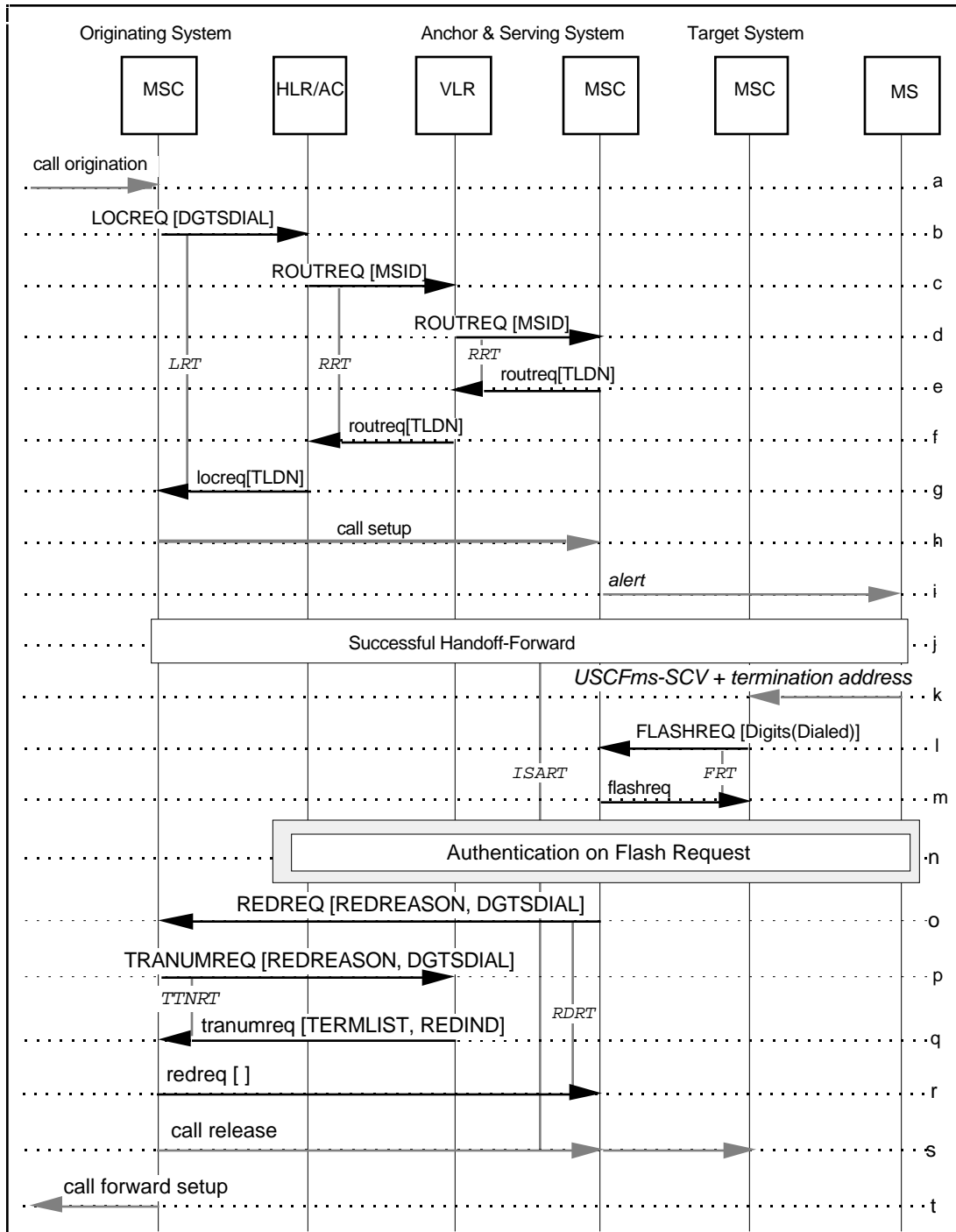


Figure 6.X.6 USCF Invocation After Handoff

a-i. Same as USCF, Section 6.x.3, Step a-i.

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- j. The Serving MSC elects, based on its internal algorithm, to initiate and in this case successfully completes a handoff forward; see Chapter 2, Section 5.1 Successful Handoff-Forward. In this case, the HandoffState parameter is included in the FACDIR set to indicate that the terminator is handing off, and the Anchor MSC starts the InterSystemAnswer Response Timer (ISART).

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Note: Handoff to a system which does not support USCF is allowed at this point, but USCF cannot be invoked for this call while the MS is served by a system that does not support USCF. An MS should not offer the subscriber the option of invoking USCF while served by such a system.

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- k. The called subscriber responds to the call by initiating an MS specific USCF operation to initiate call forwarding to an MS stored USCF DN. The MS uses an air interface specific mechanism to send the USCFms-SCV (value 16) in conjunction with a termination address towards the MSC.
- l. The Target (now serving) MSC recognizes that it has received an SCV (other than the AH-SCV) along with accompanying termination address. The Target (now Serving) MSC converts the received SCV and termination address to SCCS format (if not received in that format); it populates the Digits (Dialed) parameter with the resultant SCCS; and it sends that parameter in a FLASHREQ to the Anchor MSC.

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The air interface states of the MS and the Serving MSC are unaffected.

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- m. The Anchor MSC returns a flashreq.
- n. The Anchor MSC recognizes that USCFms has been invoked. The Serving MSC may initiate the Authentication on FlashRequest process, see scenario 5.4.5. If so, for the purposes of this scenario, it is assumed that authentication is successful.
- o. The Anchor MSC sends a REDREQ to the Originating MSC, indicating the subscriber's request that the call be redirected to the MS-provided termination address.

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| Parameters | Usage | Type |
|------------|--|------|
| REDREASON | Indicates the forwarding type selected by the MS user, USCFms. | R |
| DGTSDIAL | Includes the termination address received from the MS. | R |

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Note: Optionally the Anchor MSC may send the HLR a TRANUMREQ for redirection from the serving system rather than sending the REDREQ to the Originating MSC.

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- p-t. Same as USCF, Section 6.x.4, Steps m-q.

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6. "Stage-3 Protocol" Modifications

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6.1 TIA/EIA-41-D "Cellular Radiotelecommunications Intersystem Operations: Chapter 5 Signaling Protocols" Modifications

6.4.2.35 RedirectionRequest

(TIA/EIA-41-D Chapter 5, page 5-91)

The RedirectionRequest operation is used by the Serving MSC to request redirection of a call by the Originating MSC.

The RedirectionRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

Table 78 RedirectionRequest INVOKE Parameters

| RedirectionRequest INVOKE Parameters | | | | Timer: RDRT |
|--------------------------------------|-------------------|----------|-----------------|-------------|
| Field | Value | Type | Reference | Notes |
| Identifier | SET [NATIONAL 18] | M | 6.3.2.1 | |
| Length | variable octets | M | 6.3.2.1 | |
| Contents | | | | |
| BillingID (Originating) | | M | 6.5.2.16 | |
| ElectronicSerialNumber | | M | 6.5.2.63 | |
| MobileIdentificationNumber | | M | 6.5.2.81 | |
| RedirectionReason | | M | 6.5.2.110 | |
| <u>Digits (Dialed)</u> | | <u>O</u> | <u>6.5.2.58</u> | <u>c</u> |
| LegInformation | | O | 6.5.2.75 | a |
| MSCIdentificationNumber | | O | 6.5.2.83 | b |

Notes:

- a. Include if available (i.e., if provided in the associated RoutingRequest INVOKE component).
- b. Include to identify Serving MSC.
- c. Include to carry the termination address associated to a request for USCFms.

The remainder of this section is retained unchanged.

6.4.2.46 TransferToNumberRequest

(TIA/EIA-41-D Chapter 5, page 5-110)

The TransferToNumberRequest operation is used during feature processing to obtain an MS's forward-to number from the HLR.

The TransferToNumberRequest operation is initiated with a TCAP INVOKE (LAST). This is carried by a TCAP QUERY WITH PERMISSION package. The Parameter Set is encoded as follows:

Table 100 TransferToNumberRequest INVOKE Parameters

| TransferToNumberRequest INVOKE Parameters | | | | Timer: TTNRT |
|---|-------------------|------|-----------|--------------|
| Field | Value | Type | Reference | Notes |
| Identifier | SET [NATIONAL 18] | M | 6.3.2.1 | |
| Length | variable octets | M | 6.3.2.1 | |
| Contents | | | | |
| ElectronicSerialNumber | | M | 6.5.2.63 | |
| MobileIdentificationNumber | | M | 6.5.2.81 | |
| RedirectionReason | | M | 6.5.2.110 | |
| SystemMyTypeCode (MSC) | | M | 6.5.2.147 | |
| BillingID (Originating) | | O | 6.5.2.16 | a |
| Digits (Dialed) | | O | 6.5.2.58 | g |
| GroupInformation | | O | 6.5.2.69 | b |
| LegInformation | | O | 6.5.2.75 | c |
| MSCID (Originating) | | O | 6.5.2.82 | d |
| MSCIdentificationNumber | | O | 6.5.2.83 | e |
| PilotBillingID | | O | 6.5.2.94 | f |
| PilotNumber | | O | 6.5.2.95 | f |
| TransactionCapability | | O | 6.5.2.160 | e |

Notes:

- a. Include to identify the Originating MSC and its BillingID for subsequent call redirection.
- b. Include if available (i.e., if provided in the associated RoutingRequest INVOKE or LocationRequest RETURN RESULT) for the *None Reachable* termination trigger.
- c. Include if available (i.e., if provided in the associated RoutingRequest INVOKE or LocationRequest RETURN RESULT) for any termination trigger except *None Reachable*.
- d. Include on TIA/EIA-41 or later.
- e. Include on IS-41-C or later.
- f. Include if available.
- g. Include to carry the termination address associated to a request for USCFms.

The remainder of this section is retained without modification.

6.5 MAP PARAMETERS

(TIA/EIA-41-D Chapter 5, page 5-119)

6.5.2 Parameter Definitions

(TIA/EIA-41-D Chapter 5, page 5-128)

6.5.2.20 CallingFeaturesIndicator

(TIA/EIA-41-D Chapter 5, page 5-153)

The CallingFeaturesIndicator (CFI) parameter defines the authorization and activity states of the MS's features.

The minimum length of this parameter is 2 octets.

| Field | Value | Type | Reference | Notes | | | | | |
|------------------|---|---------------------------------|------------------|----------|----------|----------|----------|----------|--------------|
| Identifier | CallingFeaturesIndicator IMPLICIT OCTET STRING | M | 6.5.1.2 | | | | | | |
| Length | variable octets | M | 6.5.1.1 | | | | | | |
| Contents | | | | | | | | | |
| H | G | F | E | D | C | B | A | octet | Notes |
| CW-FA | CFNA-FA | CFB-FA | CFU-FA | 1 | a | | | | |
| CT-FA | VP-FA | CD-FA | 3WC-FA | 2 | a | | | | |
| CNIROver-FA | CNIR-FA | CNIP2-FA | CNIP1-FA | 3 | a | | | | |
| <u>USCFvm-FA</u> | <u>Reserved</u> | <u>DP-FA</u> <i>(IS-737)</i> | <u>PCW-FA</u> | 4 | a, b | | | | |
| <u>Reserved</u> | | <u>USCFnr-FA</u> | <u>USCFms-FA</u> | 5 | a, b | | | | |
| • • • | | | | | | | | <i>n</i> | <i>c</i> |

Figure 27 CallingFeaturesIndicator parameter

Notes:

- a. CFU-FA, CFB-FA, etc., denotes the FeatureActivity status for the designated feature, where the FeatureActivity encoding is defined in Table 125.
 - **CFU-FA** = Call Forwarding–Unconditional: FeatureActivity.
 - **CFB-FA** = Call Forwarding–Busy: FeatureActivity.
 - **CFNA-FA** = Call Forwarding–No Answer: FeatureActivity.
 - **CW-FA** = Call Waiting: FeatureActivity.
 - **3WC-FA** = Three-Way Calling: FeatureActivity.
 - **CD-FA** = Call Delivery: FeatureActivity (not interpreted on reception by *IS-41-C* or later).
 - **VP-FA** = Voice Privacy: FeatureActivity.
 - **CT-FA** = Call Transfer: FeatureActivity.
 - **CNIP1-FA** = One number (network-provided only) Calling Number Identification Presentation: FeatureActivity. CNIP2-FA takes precedence over CNIP1-FA.

- **CNIP2-FA** = Two number (network-provided and user-provided) Calling Number Identification Presentation: FeatureActivity. CNIP2-FA takes precedence over CNIP1-FA.
 - **CNIR-FA** = Calling Number Identification Restriction: FeatureActivity. An *Authorized and Activated* value for CNIR-FA indicates that Calling Number Identification Presentation is restricted.
 - **CNIROver-FA** = Calling Number Identification Restriction Override: FeatureActivity. An *Authorized and activated* value for CNIROver indicates that Calling Number Identification Restriction is overridden.
 - **PCW-FA** = Priority Call Waiting: FeatureActivity.
 - **DP-FA** = Data Privacy: FeatureActivity. (Note: part of *IS-737*.)
 - **USCFvm-FA** = USCF divert to voice mail: FeatureActivity.
 - **USCFms-FA** = USCF divert to mobile station provided DN: FeatureActivity.
 - **USCFnr-FA** = USCF divert to network registered DN: FeatureActivity.
- b. Reserved bits shall be ignored on receipt and set to zero on sending.
- c. Ignore extra octets, if received. Send only defined (or significant) octets.

Table 125 CallingFeaturesIndicator value

| <i>FeatureActivity</i> | | | | |
|------------------------|------|---|-------|-------------------------------------|
| Bits | H | G | Value | Meaning |
| | or F | E | | |
| | or D | C | | |
| | or B | A | | |
| | 0 | 0 | 0 | Not used. |
| | 0 | 1 | 1 | Not authorized. |
| | 1 | 0 | 2 | Authorized but de-activated. |
| | 1 | 1 | 3 | Authorized and activated. |

6.5.2.62 DMH_RedirectionIndicator

(TIA/EIA-41-D Chapter 5, page 5-194)

(TIA/EIA-41-D Miscellaneous Revision-10, page 72)

The DMH_RedirectionIndicator (REDIND) parameter indicates the reason for extending an incoming call for recording purposes and possibly for other purposes (e.g., monitoring for call forwarding loops).

| Field | Value | Type | Reference | Notes | | | | | |
|------------|---|-----------------------|-----------|----------|----------|----------|----------|----------|--------------|
| Identifier | DMH_RedirectionIndicator IMPLICIT ENUMERATED | M | 6.5.1.2 | | | | | | |
| Length | variable octets | M | 6.5.1.1 | a | | | | | |
| Contents | | | | | | | | | |
| H | G | F | E | D | C | B | A | octet | Notes |
| Sign | MSB | Redirection Indicator | | | | | | 1 | <u>b</u> |
| • • • | | | | | | | LSB | <i>n</i> | |

Figure 70 DMH_RedirectionIndicator parameter

Notes:

- a. If a value is received using more octets than supported, change the received value to value 0, *Not specified*.
- b. See *DMH* parameter RedirectionIndicator for the definition of values in this field.

Table 140 DMH_RedirectionIndicator value

| <i>Redirection Indicator (octet 1)</i> | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|-------|---|
| Bits | H | G | F | E | D | C | B | A | Value | Meaning |
| — | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Not specified. The type of redirection is not defined in this Standard. |
| — | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | CFU . The call was redirected for Call Forwarding Unconditional. |
| — | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | CFB . The call was redirected for Call Forwarding Busy. |
| — | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | CFNA . The call was redirected for Call Forwarding No Answer. |
| — | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 4 | CFO . The call was redirected for Call Forwarding Other. Note that this is not an [TIA/EIA-664] feature. |
| — | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 5 | CD Unspecified . The call was redirected for Call Delivery via an unspecified network. |
| — | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 6 | CD PSTN . The call was redirected for Call Delivery via the PSTN. |
| — | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 7 | CD Private . The call was redirected for Call Delivery via private facilities. |
| — | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 8 | PSTN Tandem . The call was routed as a PSTN tandem call. |
| — | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 9 | Private Tandem . The call was routed as a private facility tandem call. |
| — | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 10 | Busy . The call was redirected because the addressed subscriber was busy. |

Table 140 (concluded)

| | | | | | | | | | | |
|--|---|---|---|---|---|---|---|----|---|--|
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 11 | Inactive. The call was redirected because the addressed subscriber was inactive. | |
| 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 12 | Unassigned. The call was redirected because the addressed directory number was unassigned. | |
| 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 13 | Termination Denied. The call was redirected because termination was denied. | |
| 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 14 | CD Failure. The call was redirected because of a <i>TIA/EIA-41</i> Call Delivery failure. | |
| 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 15 | CT. The call was redirected because of explicit call transfer. Note that this is not an <i>[TIA/EIA-664]</i> feature. This is assumed to be a “one-step” call transfer where a bridge is not involved and the invoking subscriber immediately drops out of the call. | |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 16 | MAH. The call was redirected for Mobile Access Hunting call delivery attempt. | |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 17 | FA. The call was redirected for Flexible Alerting call delivery attempt. | |
| 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 18 | Abandoned Call Leg. The call was redirected because a call leg was abandoned. | |
| 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 19 | PCA call refused. Password Call Acceptance (PCA) call was refused. | |
| 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 20 | SCA call refused. Selective Call Acceptance (SCA) call was refused. | |
| 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 21 | Dialogue. | |
| 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 22 | CFD. The call was redirected for Call Forwarding-Default. | |
| 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 23 | CD Local. The call was redirected for Call Delivery locally. | |
| 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 24 | Voice Mail Retrieval. The call was redirected for Voice Mail Retrieval. | |
| <i>Redirection Indicator (octet 1)</i> | | | | | | | | | | |
| Bits | H | G | F | E | D | C | B | A | Value | Meaning |
| | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 25 | Reserved. Treat the same as value 0, <i>Not specified.</i> |
| | | | | • | • | | | | through | |
| | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 127 | |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | Reserved for bilateral agreements. |
| | | | | • | • | | | | through | |
| | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 128 | |

6.5.2.110 RedirectionReason

(TIA/EIA-41-D Chapter 5, page 5-245)

This parameter was named FeatureIdentifier prior to this revision of the Interim Standard.

The RedirectionReason (REDREASON) parameter indicates the reason for redirection.

| Field | Value | Type | Reference | Notes | | | | | |
|--------------------|---|----------|-----------|----------|----------|----------|----------|-------|--------------|
| Identifier | RedirectionReason IMPLICIT Unsigned Enumerated | M | 6.5.1.2 | | | | | | |
| Length | 1 octet | M | 6.5.1.1 | | | | | | |
| Contents | | | | | | | | | |
| H | G | F | E | D | C | B | A | octet | Notes |
| Redirection Reason | | | | | | | | 1 | |

Figure 118 RedirectionReason parameter

Table 164 RedirectionReason value

| Bits | H | G | F | E | D | C | B | A | Value | Meaning | |
|------|---|---|---|---|---|---|---|---|---------|--|--|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Not used. | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | Busy. | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | No Answer. | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | Unconditional. | |
| | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 4 | No Page Response. | |
| | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 5 | Unavailable. | |
| | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 6 | Unroutable. A routing failure occurred while attempting to complete the call. | |
| | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 7 | Call accepted. | |
| | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 8 | Call refused. | |
| | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 9 | USCFvm. Divert to voice mail. | |
| | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 10 | USCFms. Divert to an MS provided DN. | |
| | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 11 | USCFnr. Divert to a network registered DN. | |
| | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 12 | } Reserved. Treat the same as value 2, <i>No Answer.</i> | |
| | | | | • | • | | | | through | | |
| | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 223 | | |
| | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 224 | } Reserved for TIA/EIA-41 protocol extension. If unknown, treat the same as value 2, <i>No Answer.</i> | |
| | | | | • | • | | | | through | | |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 255 | | |

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6.2 TIA/EIA-124-B Chapter 6 “Stage 3 Description: Implementation Perspective” Modifications

(TIA/EIA-124-B , page 123)

6.4.88 FeatureIndicator

(TIA/EIA-124-B , page 239)

The FeatureIndicator (FEATIND) defines the particular feature accessed by a featurecode or a remote feature operation. These features are in accordance with *ANSI/TIA/EIA-664*, except as noted.

Table 109: FeatureIndicator

| Field | Value | Type | Reference | Notes |
|------------------------------|---------------------------|--|-----------|-------|
| Identifier | FeatureIndicator IMPLICIT | M | 6.1.3.5 | a |
| Length | usually 1 octet | M | 6.1.3.6 | |
| ENUMERATED | | M | 6.5.4 | b |
| Value Identifier | Value | Value Meaning | | |
| unspecified | 0 | The type of feature is not defined by this standard. | | |
| • • • | • • • | • • • | | |
| userSelectiveCall Forwarding | 38 | user selective call forwarding | | |
| • • • | • • • | • • • | | |
| ---- | negative values | reserved for bilateral agreements. | | |
| ---- | other positive values | reserved. | | |

Notes:

- a. If this parameter is omitted, then a value 0, "unspecified," is assumed.
- b. Treat reserved values as value 0, "unspecified".

6.4.157 RedirectionIndicator

(TIA/EIA-124-B, page 285)

The RedirectionIndicator (REDIND) provides the reason for extending an incoming call.

Table 178: RedirectionIndicator

| Field | Value | Type | Reference | Notes |
|------------------|-------------------------------|--|-----------|-------|
| Identifier | RedirectionIndicator IMPLICIT | M | 6.1.3.5 | a, b |
| Length | usually 1 octet | M | 6.1.3.6 | |
| ENUMERATED | | M | 6.5.4 | c |
| Value Identifier | Value | Value Meaning | | |
| unspecified | 0 | The type of redirection is not defined by this standard. | | |
| • • • | • • • | • • • | | |
| <u>uscfVM</u> | <u>31</u> | <u>The called party requested that the call be redirected to voice mail.</u> | | |
| <u>uscfMS</u> | <u>32</u> | <u>The called party requested that the call be redirected to an MS-provided termination address.</u> | | |
| <u>uscfNR</u> | <u>33</u> | <u>The called party requested that the call be redirected to an network registered number.</u> | | |
| ----- | negative values | reserved for bilateral agreements. | | |
| ----- | other positive values | reserved. | | |

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7. TIA/EIA-41-D Chapter 6 “Signaling Procedures” Modifications

3.2.2 In Call MS Flash Attempt

(TIA/EIA-41-D Chapter 6, page 6-14)

If the MSC receives a flash request initiated by an MS engaged in a call or being alerted, the Anchor MSC shall:

~~When the MS attempts to signal during a call by pressing the [SEND] key, the Anchor MSC shall:~~

1 IF it is required to authenticate flash requests (e.g., signaling encryption is not supported):

1-1 Include the SystemAccessType parameter set to *Flash request*.

1-2 Execute the “MSC Initiating an Authentication Request” task (see 4.4.1).

1-3 IF authentication fails:

1-3-1 Execute “Local Recovery Procedures” task (see 3.5.1).

1-3-2 Exit this task.

1-4 ENDIF.

2 ENDIF.

3 IF *FlashPrivileges* are allowed by the OneTimeFeatureIndicator parameter:

3-x IF an incoming call is being offered to the subscriber (e.g., via alerting or via Call Waiting Notification):

3-x-1 IF any UserSelectiveCallForwarding type is authorized and active AND IF some type of USCF redirection has been requested:

3-x-1-1 IF the requested type of USCF redirection is not authorized and active:

3-x-1-1-1 Apply feature denial treatment, if appropriate.

3-x-1-1-2 Return to the calling task.

3-x-1-2 ENDIF.

3-x-1-3 IF either the USCFvm-SCV (value 17) or the USCFvm-SCC (17*) was received:

3-x-1-3-1 Include the RedirectionReason parameter set to *USCFvm*.

3-x-1-4 ELSEIF either the USCFnr-SCV (value 0) or the USCFnr-SCC (0*) was received:

3-x-1-4-1 Include the RedirectionReason parameter set to *USCFnr*.

3-x-1-5 ELSEIF either the USCFms-SCV (value 16) accompanied by a termination address or a USCFms-SCCS (16* + termination address) was received:

3-x-1-5-1 Include the RedirectionReason parameter set to *USCFms*.

3-x-1-5-2 Include the Digits (Dialed) parameter set to the termination address.

3-x-1-6 ELSE:

3-x-1-7 Return to the calling task.

| | | |
|------------|---|----|
| 3-x-1-8 | ENDIF. | 1 |
| 3-x-1-9 | Remove the ring-back tone. | 2 |
| 3-x-1-10 | IF the MSC is the Originating MSC: | 3 |
| 3-x-1-11-1 | Execute the “MSC Initiating a Transfer-To-Number Request” task (see 4.49.1). | 4 |
| 3-x-1-12 | ELSEIF the Originating MSC is provisioned for call redirection: | 5 |
| 3-x-1-12-1 | Execute the “MSC Initiating a Redirection Request” task (see 4.36.1). | 6 |
| 3-x-1-13 | ELSE: | 7 |
| 3-x-1-13-1 | Execute the “MSC Initiating a Transfer-To-Number Request” task (see 4.49.1). | 8 |
| 3-x-1-14 | ENDIF. | 9 |
| 3-x-1-15 | Return to the calling task. | 10 |
| 3-x-2 | ENDIF. | 11 |
| 3-y | ENDIF. | 12 |
| 3-1 | IF CW has been invoked: | 13 |
| 3-1-1 | Put the current party on hold. | 14 |
| 3-1-2 | Connect the held party. | 15 |
| 3-1-3 | Optionally apply warning tone. | 16 |
| 3-1-4 | Exit this task. | 17 |
| 3-2 | ELSEIF a call is waiting for CW treatment: | 18 |
| 3-2-1 | Put the current party on hold. | 19 |
| 3-2-2 | Connect the waiting party. | 20 |
| 3-2-3 | Optionally apply warning tone. | 21 |
| 3-2-4 | Exit this task. | 22 |
| 3-3 | ELSEIF 3WC has been invoked: | 23 |
| 3-3-1 | Add the held party to the current connection. | 24 |
| 3-3-2 | Optionally apply warning tone. | 25 |
| 3-3-3 | Exit this task. | 26 |
| 3-4 | ELSEIF CT has been invoked: | 27 |
| 3-4-1 | Drop the current party. | 28 |
| 3-4-2 | Connect the held party. | 29 |
| 3-4-3 | Optionally apply warning tone. | 30 |
| 3-4-4 | Exit this task. | 31 |
| 3-5 | ELSEIF a party is on hold: | 32 |
| 3-5-1 | Connect the held party. | 33 |
| 3-5-2 | Optionally apply warning tone. | 34 |
| 3-5-3 | Exit this task. | 35 |
| 3-6 | ELSE: | 36 |
| 3-6-1 | Put the current call on hold. | 37 |
| 3-6-2 | IF there are no digits included with the flash request: | 38 |
| 3-6-2-1 | (Wait around for the subscriber to enter digits or execute internal algorithms.) | 39 |

- 1 3-6-3 ENDIF.
- 2
- 3 3-6-4 Execute “MSC Analyze MS Dialed Number” task to set the Point Of
- 4 Return (see 3.2.3).
- 5 3-7 ENDIF.
- 6 4 ENDIF.
- 7
- 8 5 Exit this task.
- 9
- 10

3.3.5 MS Termination Alerting

(TIA/EIA-41-D Chapter 6, page 6-29)

Upon request, the MSC shall perform the following:

- 1 IF the indicated MS is *idle*:
- 1-1 IF a channel has not been allocated for the MS (i.e., the MS has not been paged):
- 1-1-1 IF an appropriate *idle* voice or traffic channel is available for the identified air interface control channel:
- 1-1-1-1 Reserve the available voice or traffic channel.
- 1-1-1-2 Execute the “Page an MS Procedure” (see 3.3.3).
- 1-1-1-3 IF the paging was locally successful:
- 1-1-1-3-1 GOTO Await Answer.
- 1-1-1-4 ELSEIF the paging was successful on another system:
- 1-1-1-4-1 Execute the “MSC Initiation of an Intersystem Setup” task (see 4.27.1).
- 1-1-1-4-2 GOTO Await Answer.
- 1-1-1-5 ELSE (the paging was unsuccessful):
- 1-1-1-5-1 IF the MS has activated Call Forwarding—No Answer in the CallingFeaturesIndicator or has the *No Page Response TerminatingTrigger* active:
- 1-1-1-5-1-1 Include the RedirectionReason parameter set to *No Page Response*.
- 1-1-1-5-1-2 IF this call has requested the *None Reachable* termination trigger AND IF this is the last leg AND IF a GroupInformation parameter was received:
- 1-1-1-5-1-2-1 Include the GroupInformation parameter.
- 1-1-1-5-1-3 ELSEIF the LegInformation parameter was received:
- 1-1-1-5-1-3-1 Include the LegInformation parameter.
- 1-1-1-5-1-4 ENDIF.
- 1-1-1-5-1-5 IF the MSC is the Originating MSC:
- 1-1-1-5-1-5-1 Execute the “MSC Initiating a Transfer-To-Number Request” task (see 4.49.1).
- 1-1-1-5-1-6 ELSEIF the Originating MSC is provisioned for call redirection:
- 1-1-1-5-1-6-1 Execute the “MSC Initiating a Redirection Request” task (see 4.36.1).
- 1-1-1-5-1-7 ELSE:
- 1-1-1-5-1-7-1 Execute the “MSC Initiating a Transfer-To-Number Request” task (see 4.49.1).

| | | |
|-------------|--|----|
| 1-1-1-5-1-8 | ENDIF. | 1 |
| 1-1-1-5-2 | ELSE: | 2 |
| 1-1-1-5-2-1 | Execute “Apply Access Denial Treatment” (see 3.4.5). | 3 |
| 1-1-1-5-2-2 | Exit this task. | 4 |
| 1-1-1-5-3 | ENDIF. | 5 |
| 1-1-1-6 | ENDIF. | 6 |
| 1-1-2 | ENDIF. | 7 |
| 1-2 | ENDIF. | 8 |
| 1-3 | IF the RoutingDigits parameter is received: | 9 |
| 1-3-1 | Analyze the routing digits to select an internal trunk group (such as, a service monitor, scrambling device). | 10 |
| 1-3-2 | Execute the “MSC CNIP Terminating Call Invocation” task (see 5.8.4). | 11 |
| 1-4 | ENDIF. | 12 |
| 1-5 | IF the MobileDirectoryNumber parameter is received: | 13 |
| 1-5-1 | Include the MobileDirectoryNumber parameter as the Called Number in the MS alerting command. | 14 |
| 1-6 | ELSE: | 15 |
| 1-6-1 | Include the MobileIdentificationNumber parameter as the Called Number in the MS alerting command. | 16 |
| 1-7 | ENDIF. | 17 |
| 1-8 | IF the AlertCode parameter received: | 18 |
| 1-8-1 | Include the AlertCode parameter in the MS alerting command to control the pitch and cadence of the alerting. | 19 |
| 1-9 | ELSE: | 20 |
| 1-9-1 | Include the system default AlertCode parameter in the MS alerting command to control the pitch and cadence of the alerting. | 21 |
| 1-10 | ENDIF. | 22 |
| 1-11 | Order the MS to alert. | 23 |
| | Await Answer (get here for normal and CW alerting, alerting has been applied, no timers have been started): | 24 |
| 1-12 | IF the TerminationTriggers is received: | 25 |
| 1-12-1 | Store the TerminationTriggers parameter for this leg. | 26 |
| 1-12-2 | IF the <i>NoAnswer</i> trigger is requested in the TerminationTriggers parameter OR IF the MS has Call Forwarding—No Answer activated in the CallingFeaturesIndicator parameter: | 27 |
| 1-12-2-1 | IF the NoAnswerTime parameter is received: | 28 |
| 1-12-2-1-1 | Start a no answer timer with the value in the received NoAnswerTime parameter. | 29 |
| 1-12-2-2 | ELSE: | 30 |
| 1-12-2-2-1 | Start a no answer timer with a system default value. | 31 |
| 1-12-2-3 | ENDIF. | 32 |
| 1-12-3 | ENDIF. | 33 |
| 1-13 | ENDIF. | 34 |
| 1-14 | IF the LegInformation parameter is received: | 35 |
| 1-14-1 | Store the LegInformation to control subsequent redirections. | 36 |
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1-15 ENDIF.

1-16 Start the alerting timer.

1-17 Apply ring back tone to the waiting call.

1-18 WAIT for the MS to answer:

1-x WHEN the MS responds with a USCF-SCV:

1-x-1 Execute the “In Call MS Flash Attempt” task (see 3.2.2).

1-19 WHEN the MS answers:

1-19-1 Remove the ring back tone.

1-19-2 Connect the MS to the waiting call.

1-19-3 IF the OneTimeFeatureIndicator parameter was received and the Call Waiting for future incoming calls field is not set to *Ignore*:

1-19-3-1 Set the Call Waiting for the existing call field in the OneTimeFeatureIndicator parameter equal to the OneTimeFeatureIndicator Call Waiting For Future Incoming Calls field.

1-19-4 ELSE (the OneTimeFeatureIndicator parameter was not received or the Call Waiting for Future Incoming Calls field is set to *Ignore*):

1-19-4-1 IF Call Waiting is *active* in the CallingFeaturesIndicator:

1-19-4-1-1 Set the Call Waiting for future incoming calls field in the OneTimeFeatureIndicator parameter set to *Normal CW*.

1-19-4-2 ELSEIF Priority Call Waiting is *active* in the CallingFeaturesIndicator:

1-19-4-2-1 Set the Priority Call Waiting for future incoming calls field in the OneTimeFeatureIndicator parameter set to *Priority CW*.

1-19-4-3 ELSE:

1-19-4-3-1 Set the *Call Waiting for future incoming calls* field in the OneTimeFeatureIndicator parameter set to *No CW*.

1-19-4-4 ENDIF.

1-19-5 ENDIF:

The remainder of this section is retained without modification.

4.15 FLASH REQUEST

(TIA/EIA-41-D Chapter 6, page 6-138)

The Flash Request operation is used to convey user initiated signaling (e.g., depressions of the **SEND** key) from the Serving MSC to the Anchor MSC to effect call features. Any digits (including an SCC or SCCS) sent entered by the MS user that are associated with the signaling **SEND** key depression, will be included in the message to the Anchor MSC. Additionally, if the MS sends an SCV, either alone or in conjunction with a termination address, the SCV (resp. SCV/termination address pair) is converted to the associated SCC (resp. SCCS) and the resultant digits will be included in the message to the Anchor MSC.

4.15.1 Serving MSC Initiating a Flash Request

(TIA/EIA-41-D Chapter 6, page 6-138)

When the Serving MSC receives a flash (or an air interface message carrying an SCV, SCC, or SCCS) from an MS that is engaged in a voice call or that is alerting, it shall perform the following:

- 1 Include the InterMSCCircuitID parameter set to the trunk for this call.
- 2 Include the MobileIdentificationNumber parameter set to the requesting MS's MIN.
- 3 Include the ElectronicSerialNumber parameter set to the requesting MS's ESN.
- 4 IF an SCV was received without accompanying termination address:
 - 4-1 Include the Digits (Dialed) parameter set to the associated SCC.
 - a ELSEIF an SCV was received along with an accompanying termination address:
 - a-1 Include the Digits (Dialed) parameter set to the associated SCCS.
 - b ELSEIF an SCC or SCCS was received:
 - b-2 Include the Digits (Dialed) parameter set to the received SCC or SCCS.
 - c ELSE:
 - c-1 Include the Digits (Dialed) parameter set to the digits (non-encrypted) received from the MS.
 - d ENDIF.
 - 4 ~~Include the Digits (Dialed) parameter set to the digits (non-encrypted) received from the MS.~~
 - 5 IF the SignalingMessageEncryptionKey (SMEKEY) parameter was provided for the MS:
 - 5-1 Include the ConfidentialityModes (CMODES-actual) parameter set to the current Signaling Message Encryption mode and Voice Privacy mode of the requesting MS.
 - 6 ENDIF.
 - 7 Send a FlashRequest INVOKE toward the Anchor MSC for this call.
 - 8 Start the Flash Request Timer (FRT).
 - 9 WAIT for a Flash Request response.
 - 10 WHEN a RETURN RESULT is received:
 - 10-1 Stop timer (FRT).
 - 10-2 Exit this task.
 - 11 WHEN a RETURN ERROR or REJECT is received:
 - 11-1 Stop timer (FRT).
 - 11-2 Execute the "Local Recovery Procedures" task (see 3.5.1).
 - 11-3 Exit this task.
 - 12 WHEN the timer (FRT) expires:
 - 12-1 Execute the "Local Recovery Procedures" task (see 3.5.1).
 - e WHEN a FacilitiesRelease INVOKE was received (see 4.13.2):
 - e-1 Stop timer (FRT).
 - e-2 Stop the alerting timer, if running.
 - e-3 Release associated inter-MSC trunk facility (see 4.13).
 - 13 ENDWAIT.

14 Exit this task.

4.24.1 MSC Awaiting InterSystemAnswer

(TIA/EIA-41-D Chapter 6, page 6-173)

When the MSC determines that it should wait for an InterSystemAnswer message, it shall do the following:

1 Start the InterSystemAnswer Response Timer (ISART).

Waiting for Answer

2 WAIT for an InterSystemAnswer INVOKE:

a WHEN a FlashRequest INVOKE containing a Digits (Dialed) parameter populated with an SCC or SCCS is received by the Anchor MSC:

a-1 Send a FlashRequest RETURN RESULT toward the Serving MSC.

a-2 IF the AH-SCC (18*) is received:

a-2-1 Stop the timer (ISART).

a-2-2 Pass the received SCC along with an indication that the call has been answered to the "MS Termination Alerting" task (see 3.3.5) running for the MS.

a-2-3 Exit this task.

a-3 ELSEIF an SCC (0* or 17*) or an SCCS (16* + termination address) for USCF is received:

a-3-1 Pass the received SCC or SCCS along with an indication that USCF call diversion has been requested to the "MS Termination Alerting" task (see 3.3.5) running for the MS.

a-3-2 GOTO Waiting for Answer.

a-4 ENDIF.

3 WHEN an InterSystemAnswer INVOKE is received from the border system:

3-1 Stop the timer (ISART).

3-2 Send an InterSystemAnswer RETURN RESULT to the Border MSC.

3-3 Connect the call path.

NOTE: After the call has been established, a subsequent handoff to the visited (Anchor) MSC should be treated as a Handoff Back.

4 WHEN a FacilitiesRelease INVOKE is received (see 4.13.2):

4-1 Stop the timer (ISART).

5 WHEN the (ISART) timer expires:

5-1 Include the ReleaseReason parameter indicating *clear forward*.

5-2 Execute the "Initiating MSC Initiating a Facilities Release" task (see 4.13.1).

5-3 Execute "Local Recovery Procedures" task (see 3.5.1).

6 ENDWAIT.

7 Exit this task.

4.24.2 MSC Initiating InterSystemAnswer

(TIA/EIA-41-D Chapter 6, page 6-173)

When the MSC determines that it should send an InterSystemAnswer message, it shall do the following:

- 1 Start an alerting timer.

Waiting for MS Answer

- 2 WAIT for the MS to answer:
 - a WHEN the MS sends an SCV, either alone or in conjunction with a termination address (whether sent using dedicated air interface specific protocol elements or sent as an SCC or SCCS using air interface procedures for sending generic digit strings):
 - a-1 IF the AH-SCV (value 18) or the AH-SCC (value 18*) was received:
 - a-1-1 Treat the received SVC (or SCC) as an indication that the call has been answered and stop the alerting timer.
 - a-1-2 Execute the “Serving MSC Initiating a Flash Request” task (see 4.15.1).
 - a-1-3 IF a RETURN ERROR or REJECT was received:
 - a-1-3-1 Release associated inter-MSC trunk facility (See 4.13).
 - a-1-4 ELSEIF the Flash Request Timer (FRT) expired:
 - a-1-4-1 Release associated inter-MSC trunk facility (See 4.13).
 - a-1-5 ENDIF.
 - a-1-6 Exit this task.
 - a-2 ELSE:
 - a-2-1 Execute the “Serving MSC Initiating a Flash Request” task (see 4.15.1).
 - a-2-2 IF the associated inter-MSC trunk facility has not been released:
 - a-2-2-1 GOTO Waiting for MS Answer.
 - a-2-3 ENDIF.
 - a-3 ENDIF.
 - 3 WHEN the MS answers:
 - 3-1 Send an InterSystemAnswer INVOKE to the Serving MSC.
 - 3-2 Start the InterSystemAnswer (ISAT) timer.
 - 3-3 WAIT for an intersystem answer response:
 - 3-4 WHEN a RETURN RESULT is received:
 - 3-4-1 Stop (ISAT) timer.
 - 3-5 WHEN a RETURN ERROR or REJECT is received:
 - 3-5-1 Stop (ISAT) timer.
 - 3-5-2 Release associated inter-MSC trunk facility (See 4.13).
 - 3-6 WHEN a FacilitiesRelease INVOKE is received (see 4.13.2):
 - 3-6-1 Stop (ISAT) timer.
 - 3-6-2 Release associated inter-MSC trunk facility (See 4.13).
 - 3-7 WHEN timer (ISAT) expires:
 - 3-7-1 Perform Local Recovery Procedures (see 3.5.1).

- 1 3-7-2 Release associated inter-MSK trunk facility (See 4.13).
- 2
- 3 3-8 ENDWAIT.
- 4 4 WHEN a FacilitiesRelease INVOKE is received (see 4.13.2):
- 5 4-1 Stop the alerting timer.
- 6 4-2 Release associated inter-MSK trunk facility (See 4.13).
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9 **Note: the remaining portion of this section is retained unchanged.**

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4.36.2 MSC Receiving RedirectionRequest INVOKE

(TIA/EIA-41-D Chapter 6, page 6-223)

16 When an MSC receives a RedirectionRequest INVOKE, it shall perform the
17 following:

- 18 1 IF the received message can be processed:
- 19 1-1 IF there is a call or leg in progress that is associated with the received
20 BillingID and MobileIdentificationNumber parameters:
- 21 1-1-x IF the RedirectionReason parameter is set to *USCFms*:
- 22 1-1-x-1 Relay the received Digits (Dialed) parameter.
- 23 1-1-y ENDIF.
- 24 1-1-1 Execute the “MSC Initiating a Transfer-To-Number Request” task (see
25 4.49.1).
- 26 1-1-2 IF the task is successful:
- 27 1-1-2-1 Send a RETURN RESULT to the requesting MSC.
- 28 1-1-2-2 Exit this task.
- 29 1-1-3 ELSE:
- 30 1-1-3-1 Execute “Local Recovery Procedures” task (see 3.5.1).
- 31 1-1-3-2 Send a RETURN ERROR with a proper Error Code value (see the
32 following table) to the requesting MSC.
- 33 1-1-3-3 Exit this task.
- 34 1-1-4 ENDIF.
- 35 1-2 ELSE (there is no such call in progress):
- 36 1-2-1 Execute “Local Recovery Procedures” task (see 3.5.1).
- 37 1-2-2 Send a RETURN ERROR with a proper Error Code value (see the
38 following table) to the requesting MSC.
- 39 1-2-3 Exit this task.
- 40 1-3 ENDIF.
- 41 2 ELSE (the received message cannot be processed):
- 42 2-1 Execute “Local Recovery Procedures” task (see 3.5.1).
- 43 2-2 Send a RETURN ERROR with a proper Error Code value (see the
44 following table) to the requesting MSC.
- 45 2-3 Exit this task.
- 46 3 ENDIF.
- 47 4 Exit this task.
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4.49.2 HLR Receiving TransferToNumberRequest INVOKE

(TIA/EIA-41-D Chapter 6, page 6-298)

When an HLR receives a TransferToNumberRequest INVOKE, it shall perform the following:

- 1 IF the received message can be processed:
 - 1-1 CASE RedirectionReason (to determine the feature processing and PointOfReturn) OF:
 - 1-a USCFvm:
 - 1-a-1 Execute the "HLR USCFvm Invocation" task (see 5.xx.1).
 - 1-a-2 IF the PointOfReturn is indicated:
 - 1-a-2-1 GOTO TraNumReqPointOfReturn.
 - 1-a-3 ENDIF.
 - 1-a-4 Include the AnnouncementCode parameter in the AnnouncementList parameter set to Reorder or other appropriate announcement.
 - 1-a-5 Set the PointOfReturn to *ToneTermination*.
 - 1-b USCFnr:
 - 1-b-1 Execute the "HLR USCFnr Invocation" task (see 5.xx.2).
 - 1-b-2 IF the PointOfReturn is indicated:
 - 1-b-2-1 GOTO TraNumReqPointOfReturn.
 - 1-b-3 ENDIF.
 - 1-b-4 Include the AnnouncementCode parameter in the AnnouncementList parameter set to Reorder or other appropriate announcement.
 - 1-b-5 Set the PointOfReturn to *ToneTermination*.
 - 1-c USCFms:
 - 1-c-1 Execute the "HLR USCFms Invocation" task (see 5.xx.3).
 - 1-c-2 IF the PointOfReturn is indicated:
 - 1-c-2-1 GOTO TraNumReqPointOfReturn.
 - 1-c-3 ENDIF.
 - 1-c-4 Include the AnnouncementCode parameter in the AnnouncementList parameter set to Reorder or other appropriate announcement.
 - 1-c-5 Set the PointOfReturn to *ToneTermination*.
 - 1-2 *No Page Response* (This is the Page Failure PointOfDetection.):

Note: the remaining portion of this section is retained unchanged.

5.xx USER SELECTIVE CALL FORWARDING (USCF)

(new for TIA/EIA-41-D Chapter 6, page 6-398)

5.xx.1 HLR USCFvm Invocation

(new for TIA/EIA-41-D Chapter 6, page 6-398)

When an HLR determines the need for USCFvm, it shall perform the following:

- 1 IF USCFvm is active and authorized:

- 1-1 Set the selected forward-to number to indicate the voice mail.
- 1-2 Execute the “HLR Select Forward-To or Diversion Number Point of Return” task (see 6.1.2).
- 1-3 Include the DMH_RedirectionIndicator parameter set to *uscfVM*:
- 2 ELSE:
- 2-1 Execute “Local Recovery Procedures” task (see 3.5.1).
- 3 ENDIF.
- 4 Return to the calling task via the PointOfReturn.

5.xx.2 HLR USCfNr Invocation

(new for TIA/EIA-41-D Chapter 6, page 6-398)

When an HLR determines the need for USCfNr, it shall perform the following:

- 1 IF USCfNr is active and authorized:
 - 1-1 Set the selected forward-to number to the subscriber’s registered USCf number.
 - 1-2 Execute the “HLR Select Forward-To or Diversion Number Point of Return” task (see 6.1.2).
 - 1-3 Include the DMH_RedirectionIndicator parameter set to *uscfNR*.
 - 2 ELSE:
 - 2-1 Execute “Local Recovery Procedures” task (see 3.5.1).
 - 3 ENDIF.
 - 4 Return to the calling task via the PointOfReturn.

5.xx.3 HLR USCfMs Invocation

(new for TIA/EIA-41-D Chapter 6, page 6-398)

When an HLR determines the need for USCfMs, it shall perform the following:

- 1 IF USCfMs is active and authorized:
 - 1-a IF the termination address received in the Digits (Dialed) parameter can be expanded into a destination address:
 - 1-a-1 IF the destination address is valid for USCfMs (e.g., it is not a special access number [e.g., Emergency Services, Operator Services, Service Code, or the subscriber’s MDN]):
 - 1-a-1-1 Set the selected forward-to number to the destination address.
 - 1-a-2 ELSE:
 - 1-a-2-1 Execute “Local Recovery Procedures” task (see 3.5.1).
 - 1-a-3 ENDIF.
 - 1-b ELSE:
 - 1-b-1 Execute “Local Recovery Procedures” task (see 3.5.1).
 - 1-1 ENDIF.
 - 1-2 Execute the “HLR Select Forward-To or Diversion Number Point of Return” task (see 6.1.2).
 - 1-3 Include the DMH_RedirectionIndicator parameter set to *uscfMS*.
 - 2 ELSE:

- 2-1 Execute “Local Recovery Procedures” task (see 3.5.1).
- 3 ENDIF.
- 4 Return to the calling task via the PointOfReturn.

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