

3GPP2 X.S0004-330-E

v 1.0

Date: April 2008



3RD GENERATION  
PARTNERSHIP  
PROJECT 2  
"3GPP2"

## Mobile Application Part (MAP) -

### VOICE FEATURE SCENARIOS: PASSWORD CALL ACCEPTANCE / SELECTIVE CALL ACCEPTANCE

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# REVISION HISTORY

| Revision           | Date       | Remarks              |
|--------------------|------------|----------------------|
| X.S0004-330-E v1.0 | April 2008 | Initial publication. |

# 1 INTRODUCTION

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Unless otherwise noted, the scenarios in this section depict features operating individually; i.e., feature interactions are not considered unless specifically noted.

Also, please note that the scenarios in this section do not include a complete listing of operation parameters, either in the figures or in the accompanying text descriptions. Parameters are included where they are deemed necessary to improve the understanding of the scenario. For a complete description of the parameters associated with each operation, refer to Parts 540 and 550.

## 2 PASSWORD CALL ACCEPTANCE

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This section depicts the interactions between network entities in various situations related to automatic roaming and Password Call Acceptance (PCA). These scenarios are for illustrative purposes only.

### 2.1 PCA Demand Activation or De-Activation

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The information flows required for the demand activation or de-activation of PCA by an authorized MS are described in *Part 311 Section 2.1*.

### 2.2 PCA Variable Diversion Registration or De-Registration

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The information flows required for the registration or de-registration of PCA variable diversion by an authorized MS are described in *Part 311 Section 2.1*.

### 2.3 PCA Password Registration or De-Registration

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The information flows required for the registration or de-registration of PCA variable number by an authorized MS are described in *Part 311 Section 2.1*.

## 2.4 PCA Invocation with Call Accepted

This scenario describes the invocation of PCA for an authorized MS, with the result being call acceptance.

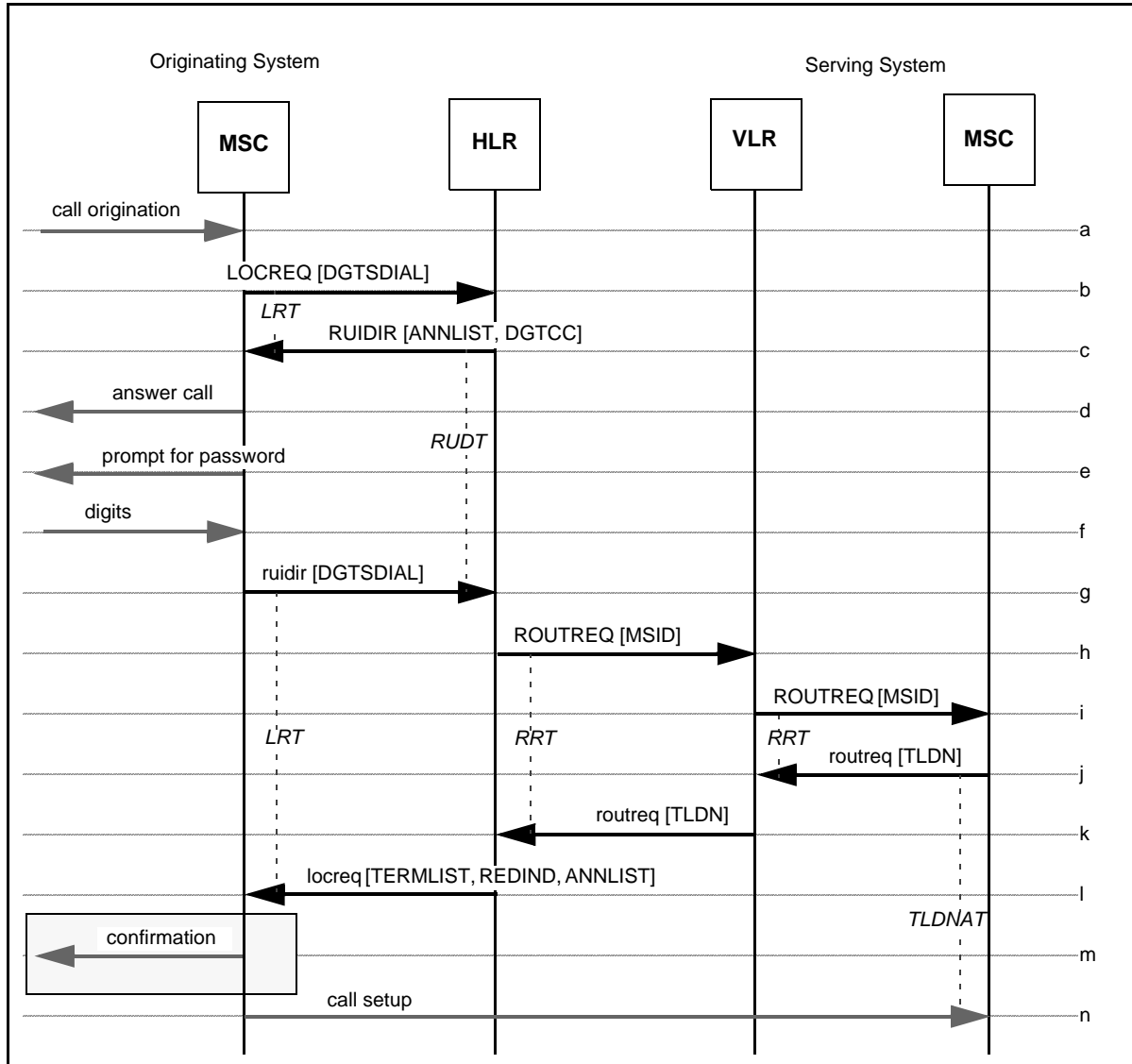


Figure 1 — PCA Invocation with Call Accepted

- a. A call origination and the dialed MS address digits (i.e., directory number) are received by the Originating MSC.
- b. The Originating MSC sends a LOCREQ to the MS's HLR.  
The HLR determines from the MS's service profile that PCA is active; therefore, it initiates a user interaction session.
- c. The HLR sends a RUIDIR to the Originating MSC.
- d. On receipt of the RUIDIR, the Originating MSC turns off the LOCREQ timer and provides call treatment as indicated in the received message. In this case, the treatment is to answer the call (i.e., connect the calling party to subsystem capable of user interaction).

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- 1 e. The Originating MSC prompts the user based on the information in the received  
2 RUIDIR, and wait for digits.
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- 4 f. The user responds with its password digits.
- 5 g. The Originating MSC sends a `ruidir` to the HLR, containing the digits dialed by the  
6 user. The HLR checks the digits received against the PCA screening list for the called  
7 MS. In this scenario, the password is matched with an entry in the list; therefore, the  
8 call is allowed to proceed.
- 9
- 10 h. If the dialed MS address digits are assigned to a legitimate subscriber, the HLR sends  
11 a `ROUTREQ` to the VLR where the MS is registered.
- 12 i. The VLR then forwards the `ROUTREQ` to the current Serving MSC.
- 13 j. In reaction to the `ROUTREQ`, the Serving MSC checks its internal data structures and  
14 determines that the MS is currently idle. The Serving MSC allocates a TLDN and  
15 returns this information to the VLR in the `routreq`.
- 16
- 17 k. The VLR sends the `routreq` to the HLR.
- 18 l. When the `routreq` is received by the HLR, it returns a `locreq` to the Originating  
19 MSC. The `locreq` includes routing information in the form of the TerminationList  
20 parameter, along with an indication of the reason for extending the incoming call (i.e.,  
21 for CD) in the `DMH_RedirectionIndicator` parameter. It also may include an  
22 `AnnouncementList` parameter, containing a PCA confirmation announcement to be  
23 provided to the calling party.
- 24
- 25 m. The Originating MSC provides call treatment as indicated in the `locreq`. In this case,  
26 the treatment is to, optionally, provide a confirmation announcement.
- 27
- 28 n. The Originating MSC establishes a voice path to the Serving MSC using existing  
29 interconnection protocols (e.g. SS7) and the routing information specified in the  
30 `locreq`.
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## 2.5 PCA Invocation with Call Accepted: Alternate Procedure

This scenario describes an alternate procedure for the invocation of PCA for an authorized MS, with the result being call acceptance.

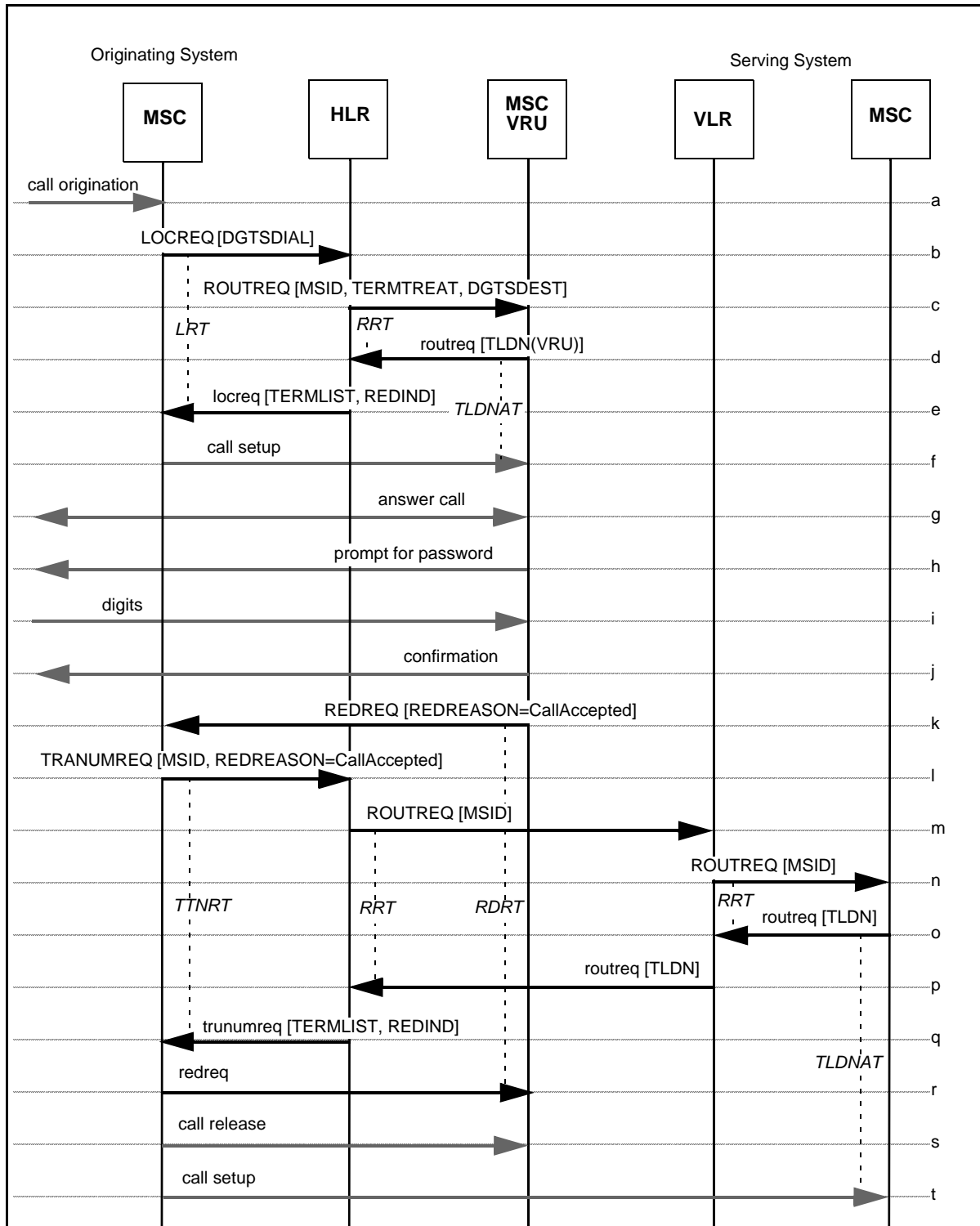


Figure 2 — PCA Invocation with Call Accepted: Alternate Procedure

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- 1 a. A call origination and the dialed MS address digits (i.e., directory number) are received
- 2 by the Originating MSC.
- 3
- 4 b. The Originating MSC sends a `LOCREQ` to the MS's HLR.
- 5 c. The HLR determines from the MS's service profile that PCA is active; therefore, it
- 6 sends a `ROUTREQ` to an associated Voice Response Unit (MSC-VRU), including the
- 7 called MIN and an indication that a PCA dialog is requested.
- 8
- 9 d. The MSC-VRU allocates a TLDN and returns it to the HLR in a `routreq`.
- 10 e. When the `routreq` is received by the HLR, it returns a `locreq` to the Originating
- 11 MSC. The `locreq` includes routing information in the form of the `TerminationList`
- 12 parameter, along with an indication of the reason for extending the incoming call (i.e.,
- 13 for PCA) in the `DMH_RedirectionIndicator` parameter.
- 14
- 15 f. The Originating MSC provides call treatment as indicated in the `locreq`. In this case,
- 16 the treatment is to establish a voice path to the MSC-VRU using existing
- 17 interconnection protocols (e.g. SS7) and the routing information specified in the
- 18 `locreq`.
- 19 g-j. The calling party enters a dialog with the MSC-VRU that may include voice prompts
- 20 and entry of responses through DTMF digits or spoken words. The dialog may be
- 21 more complex than shown here, including retransmission of the password if necessary.
- 22
- 23 k. The PCA dialog being successfully completed, the MSC-VRU initiates redirection by
- 24 sending a `REDREQ` to the Originating MSC with the `RedirectionReason` set to *Call*
- 25 *Accepted*.
- 26 l. The Originating MSC sends a `TRANUMREQ` to the HLR requesting the routing
- 27 information appropriate for the *Call Accepted* condition.
- 28
- 29 m. The HLR sends a `ROUTREQ` to the VLR where the MS is registered.
- 30
- 31 n. The VLR forwards the `ROUTREQ` to the current Serving MSC.
- 32
- 33 o. In reaction to the `ROUTREQ`, the Serving MSC checks its internal data structures and
- 34 determines that the MS is currently idle. The Serving MSC allocates a TLDN and
- 35 returns this information to the VLR in a `routreq`.
- 36
- 37 p. The VLR sends the `routreq` to the HLR.
- 38
- 39 q. The HLR sends a `tranumreq` to the Originating MSC, including the TLDN in the
- 40 `TerminationList` parameter, along with an indication of the reason for extending the
- 41 incoming call (i.e., for CD) in the `DMH_RedirectionIndicator` parameter.
- 42
- 43 r. When the `tranumreq` is received from the HLR, the Originating MSC sends a
- 44 `redreq` to the MSC-VRU.
- 45
- 46 s. The Originating MSC releases the inter-MSC call.
- 47
- 48 t. The Originating MSC initiates call setup to the TLDN.
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## 2.6 PCA Invocation with Call Refused to Tone or Announcement

This scenario describes the invocation of PCA for an authorized MS, with the result being call refusal to a tone or announcement.

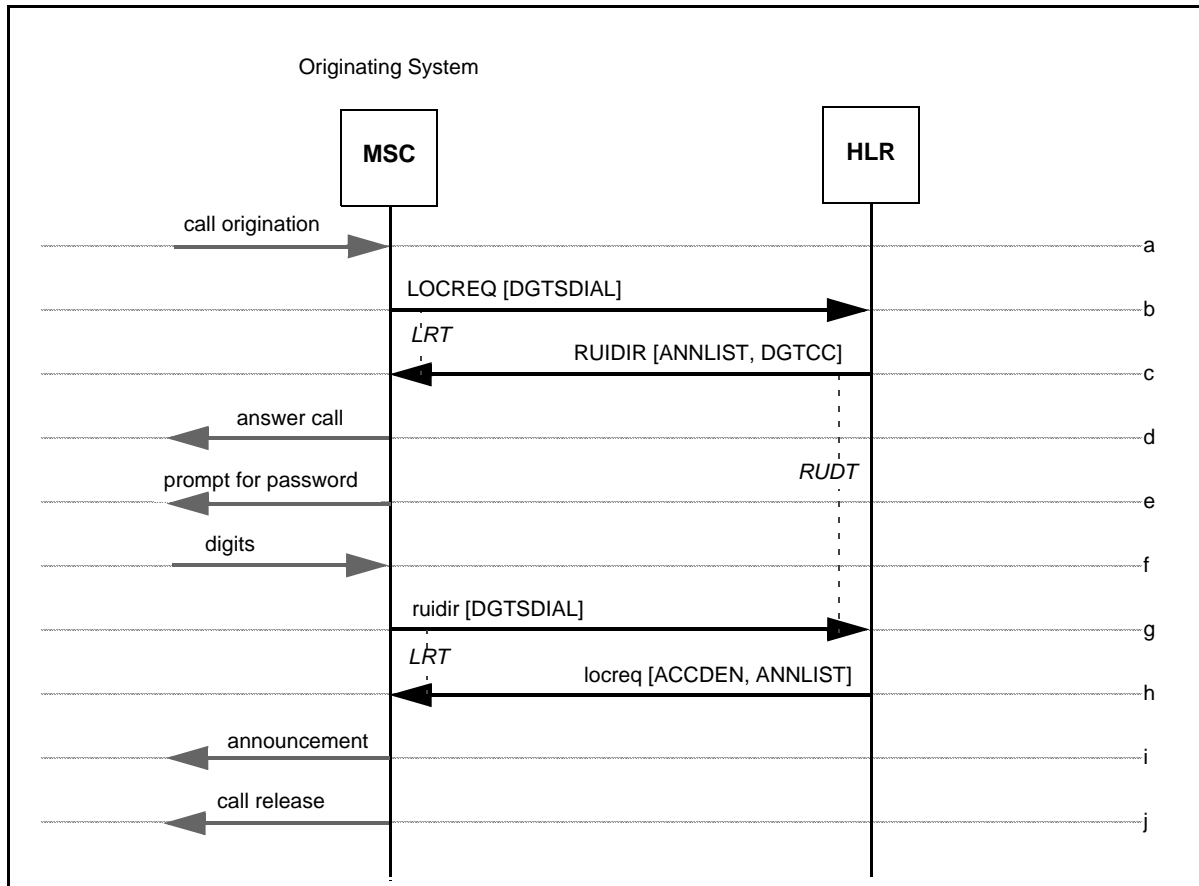


Figure 3 — PCA Invocation with Call Refused to Tone or Announcement

- a-f. Same as PCA, Section 2.4, Steps a-f.
- g. The Originating MSC sends a `ruidir` to the HLR, containing the digits dialed by the user. The HLR checks the digits received against the PCA screening list for the called MS. In this scenario, the password is not matched with an entry in the list; therefore, the call is not allowed to proceed.
- h. The HLR returns a `locreq` to the Originating MSC, including the `AccessDeniedReason` parameter. The `locreq` may also include an `AnnouncementList` parameter indicating a particular announcement to be provided to the calling party.
- i. The Originating MSC provides call treatment as indicated in the `locreq`. In this case, the treatment is to apply a refusal announcement.
- j. The Originating MSC releases the call.

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## 2.7 PCA Invocation with Call Refused to Voice Mail

This scenario describes the invocation of PCA for an authorized MS, with the result being call refusal to a voice message system.

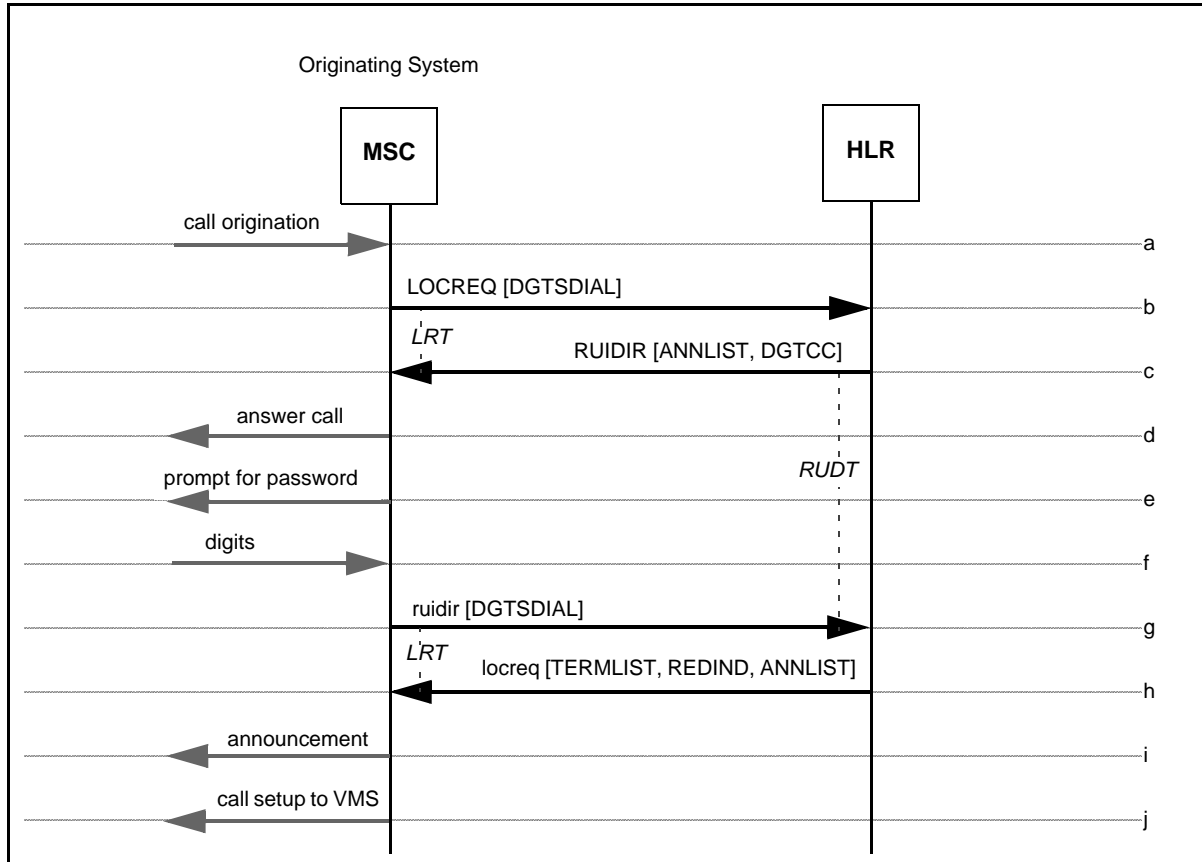
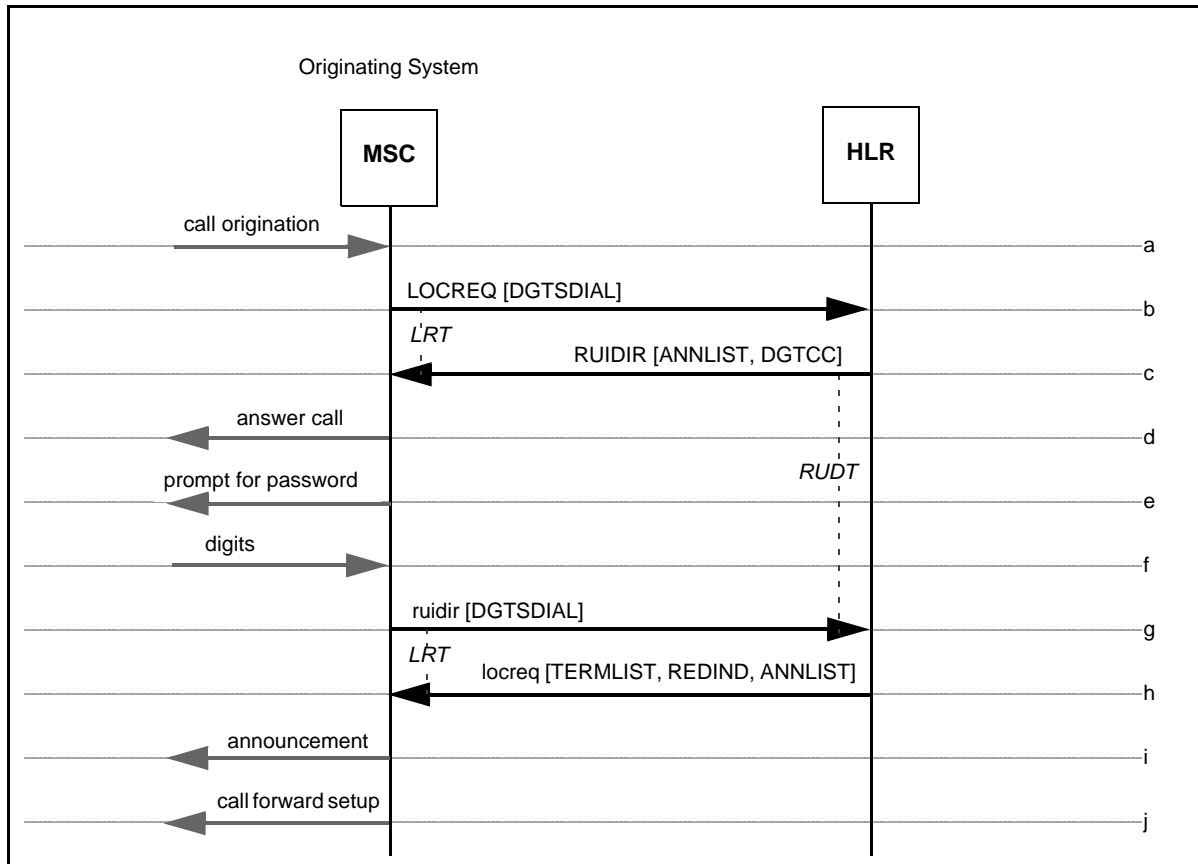


Figure 4 — PCA Invocation with Call Refused to Voice Mail

- a-f. Same as PCA, Section 2.4, Steps a-f.
- g. The Originating MSC sends a `ruidir` to the HLR, containing the digits dialed by the user. The HLR checks the digits received against the PCA screening list for the called MS. In this scenario, the password is not matched with an entry in the list; therefore, the call is not allowed to proceed to the MS but is to be forwarded to a voice mail system (VMS).
- h. The HLR sends a `locreq` to the Originating MSC, including the VMS DN in the TerminationList parameter, along with an indication of the reason for extending the incoming call (i.e., for PCA) in the DMH\_RedirectionIndicator parameter. The `locreq` may also include an AnnouncementList parameter indicating a particular announcement to be provided to the calling party.
- i. The Originating MSC provides call treatment as indicated in the `locreq`. In this case, the treatment is to, optionally, apply an announcement indicating that an incorrect password was entered.
- j. The Originating MSC routes the call to the VMS.

## 2.8 PCA Invocation with Call Refused to Forward-To Number

This scenario describes the invocation of PCA for an authorized MS, with the result being call refusal to a forward-to number.



**Figure 5 — PCA Invocation with Call Refused to Forward-To Number**

- a-f. Same as PCA, Section 2.4, Steps a-f.
- g. The Originating MSC sends a `ruidir` to the HLR, containing the digits dialed by the user. The HLR checks the digits received against the PCA screening list for the called MS. In this scenario, the password is not matched with an entry in the list; therefore, the call is not allowed to proceed to the MS but is to be forwarded to a DN.
- h. The HLR sends a `locreq` to the Originating MSC, including the forward-to DN in the TerminationList parameter, along with an indication of the reason for extending the incoming call (i.e., for PCA) in the DMH\_RedirectionIndicator parameter. The `locreq` may also include an AnnouncementList parameter indicating a particular announcement to be provided to the calling party.
- i. The Originating MSC provides call treatment as indicated in the `locreq`. In this case, the treatment is to, optionally, apply an announcement indicating that an incorrect password was entered.
- j. The Originating MSC routes the call to the forward-to DN.

## 3 SELECTIVE CALL ACCEPTANCE

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

### 3.1 SCA Demand Activation or De-Activation

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The information flows required for the demand activation or de-activation of SCA by an authorized MS are described in *Part 311 Section 2.1*.

### 3.2 SCA Variable Diversion Registration

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The information flows required for the registration of SCA variable diversion by an authorized MS are described in *Part 311 Section 2.1*.

### 3.3 SCA Variable Number Registration or De-Registration

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The information flows required for the registration or de-registration of SCA variable number by an authorized MS are described in *Part 311 Section 2.1*.

### 3.4 SCA Invocation with Call Accepted

This scenario describes the invocation of SCA for an authorized MS, with the result being call acceptance.

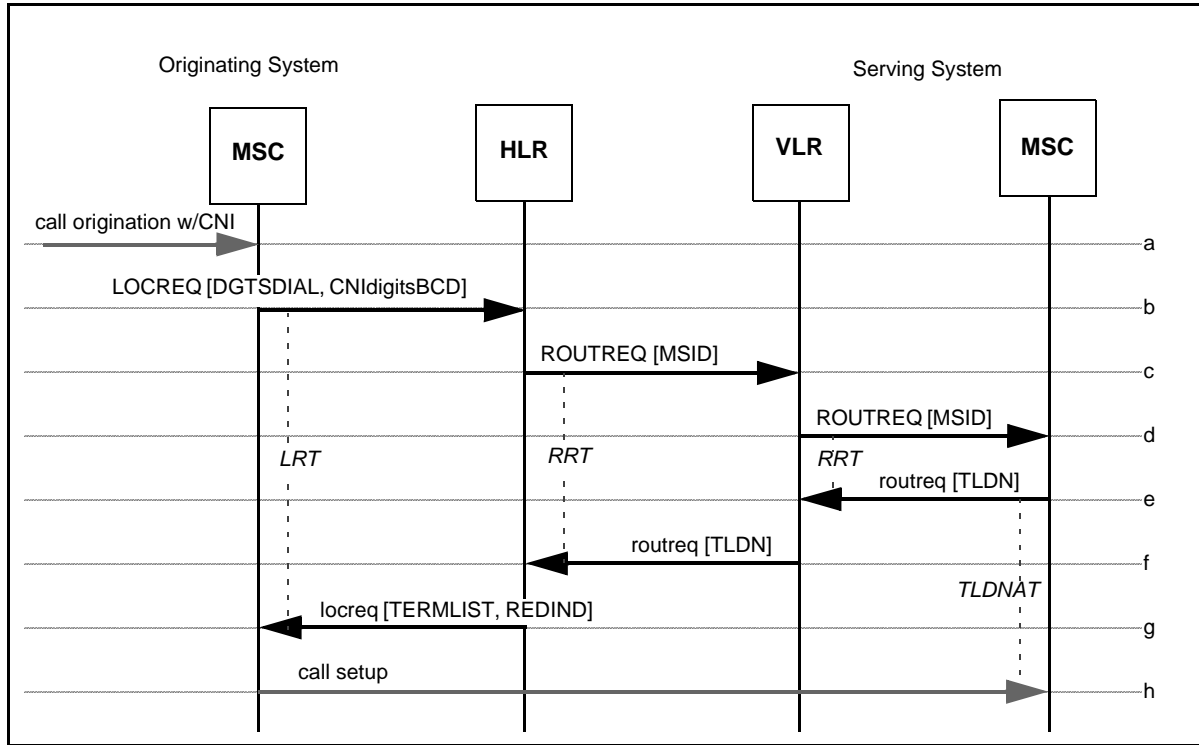


Figure 6 — SCA Invocation with Call Accepted

- a. A call origination and the dialed MS address digits (i.e., directory number), as well as calling number identification (CNI) information, are received by the Originating MSC.
- b. The Originating MSC sends a LOCREQ to the MS's HLR, including the CNI information. Note that, for the purposes of SCA, subaddress information is not required.

| Additional Parameters        | Usage   | Type |
|------------------------------|---|------|
| CNIdigitsBCD:                | CNI digits parameters in BCD format:  |      |
| [CallingPartyNumber-Digits1] | Calling number digits (network-provided), incl. presentation restriction information. | R    |
| [CallingPartyNumber-Digits2] | Calling number digits (user-provided), incl. presentation restriction information.    | O    |
| [RedirectingNumber-Digits]   | Redirecting number digits, incl. presentation restriction information.                | O    |

- c. The HLR determines from the MS's service profile that SCA is active. It checks the CNI received in the LOCREQ against the SCA screening list for the called MS. In this scenario, the CNI is matched with an entry in the list; therefore, the call is allowed to proceed.  
The HLR constructs a ROUTREQ and sends it to the VLR where the MS is registered.
- d. The VLR forwards the ROUTREQ to the current Serving MSC.

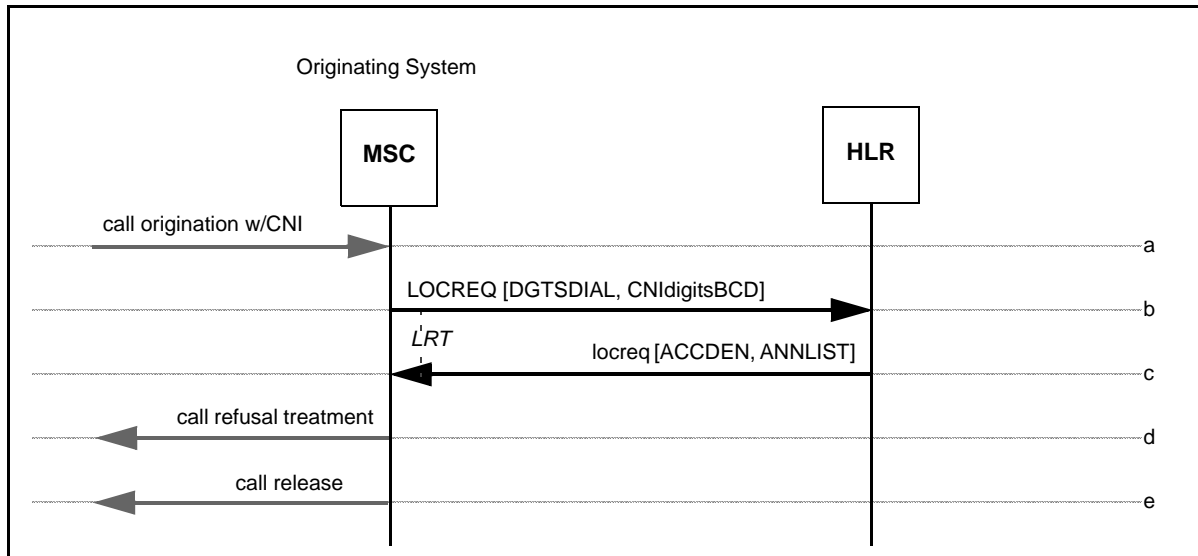
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- e. In reaction to the `ROUTREQ`, the Serving MSC checks its internal data structures and determines that the MS is currently idle. Therefore the Serving MSC allocates a TLDN and returns this information to the VLR in the `roureq`.
- f. The VLR sends the `roureq` to the HLR.
- g. When the `roureq` is received by the HLR, it returns a `locreq` to the Originating MSC. The `locreq` includes routing information in the form of 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. A voice path is then established between the Originating MSC and the Serving MSC using protocols defined by the interconnection method.

### 3.5 SCA Invocation with Call Refused to Tone or Announcement

This scenario describes the invocation of SCA for an authorized MS, with the result being call refusal to a tone or announcement.



**Figure 7 — SCA Invocation with Call Refused to Tone or Announcement**

- a-b. Same as SCA, Section 3.4, Steps a-b.
- c. In this scenario, the CNI is not matched with an entry in the list and SCA variable diversion is not registered; therefore, the call is given refusal treatment. The HLR returns a `locreq` to the Originating MSC including the reason for denying access. The `locreq` may also include an `AnnouncementList` parameter indicating a particular announcement to be provided to the calling party.
- d. The Originating MSC provides treatment to the served MS as indicated in the `locreq`. In this case, the treatment is to provide call refusal treatment.
- e. The Originating MSC releases the call.

### 3.6 SCA Invocation with Call Refused to Voice Mail

This scenario describes the invocation of SCA for an authorized MS, with the result being call refusal to a voice message system.

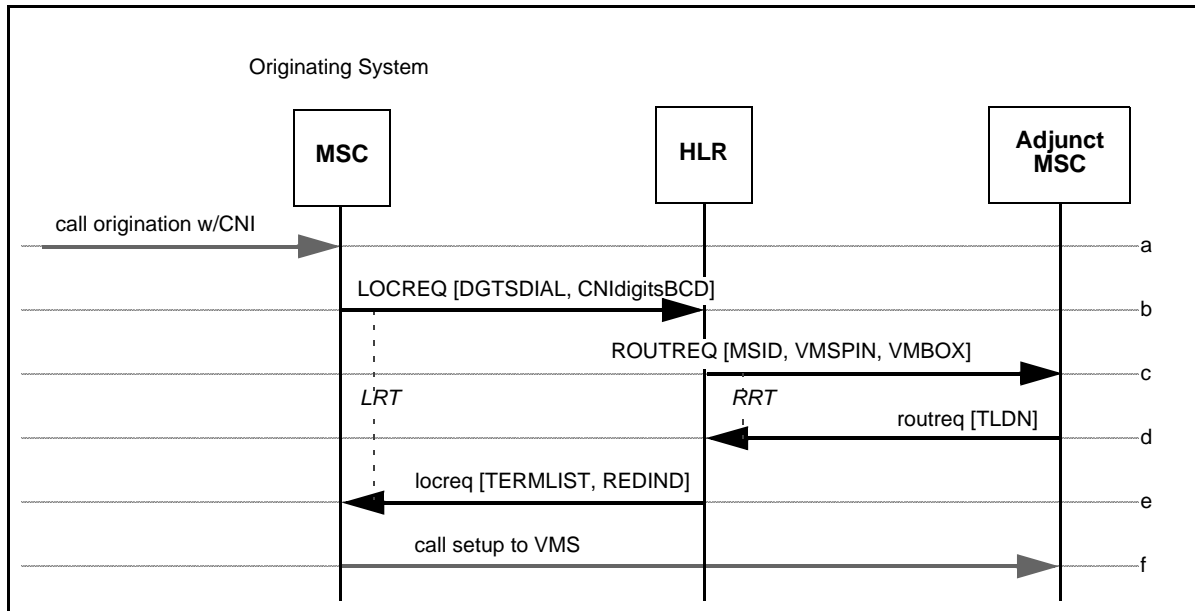
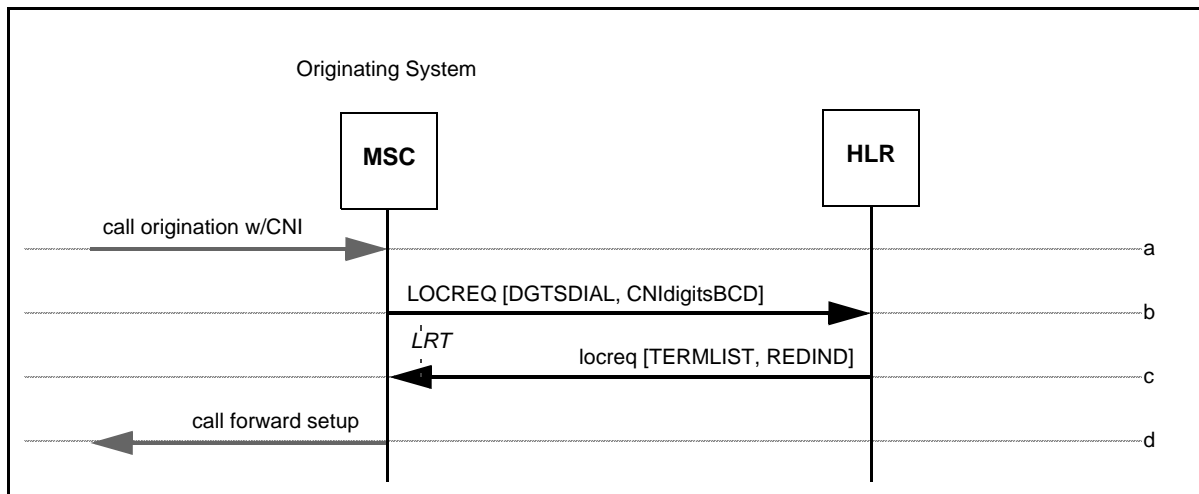


Figure 8 — SCA Invocation with Call Refused to Voice Mail

- a-b. Same as SCA, Section 3.4, Steps a-b.
- c. In this scenario, the CNI is not matched with an entry in the list but SCA variable diversion is registered with the forward-to number that of a voice message system (VMS). The HLR sends a ROUTREQ to the Adjunct MSC.
- d. The Adjunct MSC allocates a TLDN and returns this information to the HLR in the routreq.
- e. The HLR sends a locreq to the Originating MSC, including the VMS DN in the TerminationList parameter, along with an indication of the reason for extending the incoming call (i.e., for SCA) in the DMH\_RedirectionIndicator parameter. The locreq may also include an AnnouncementList parameter indicating a particular announcement to be provided to the calling party.
- f. The Originating MSC then establishes a call to the specified forward-to number (i.e., the VMS).

### 3.7 SCA Invocation with Call Refused to Forward-To Number

This scenario describes the invocation of SCA for an authorized MS, with the result being call refusal to a forward-to number.



**Figure 9 — SCA Invocation with Call Refused to Forward-To Number**

- a-b. Same as SCA, Section 3.4, Steps a-b.
- c. In this scenario, the CNI is not matched with an entry in the list but SCA variable diversion is registered with a forward-to number. The HLR sends a `locreq` to the Originating MSC, including the forward-to DN in the TerminationList parameter, along with an indication of the reason for extending the incoming call (i.e., for SCA) in the `DMH_RedirectionIndicator` parameter. The `locreq` may also include an `AnnouncementList` parameter indicating a particular announcement to be provided to the calling party.
- d. The Originating MSC then establishes a call to the specified forward-to number.

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