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3RD GENERATION
PARTNERSHIP
PROJECT 2
"3GPP2"

Mobile Application Part (MAP) -

VOICE FEATURE SCENARIOS: CALLING NAME PRESENTATION, CALLING NAME RESTRICTION

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REVISION HISTORY

Revision	Date	Remarks
X.S0004-335-E v1.0	January 2009	Initial publication.

1 INTRODUCTION

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

The scenarios in this part 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 CALLING NAME PRESENTATION

This section depicts the interactions between network entities in various situations related to automatic roaming and Calling Name Presentation (CNAP). These scenarios are for illustrative purposes only.

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2.1 CNAP Invocation to an Idle MS

This scenario describes CNAP invocation to an idle, authorized MS which has CNAP active. The HLR queries an SCP to obtain the text to present to the called subscriber.

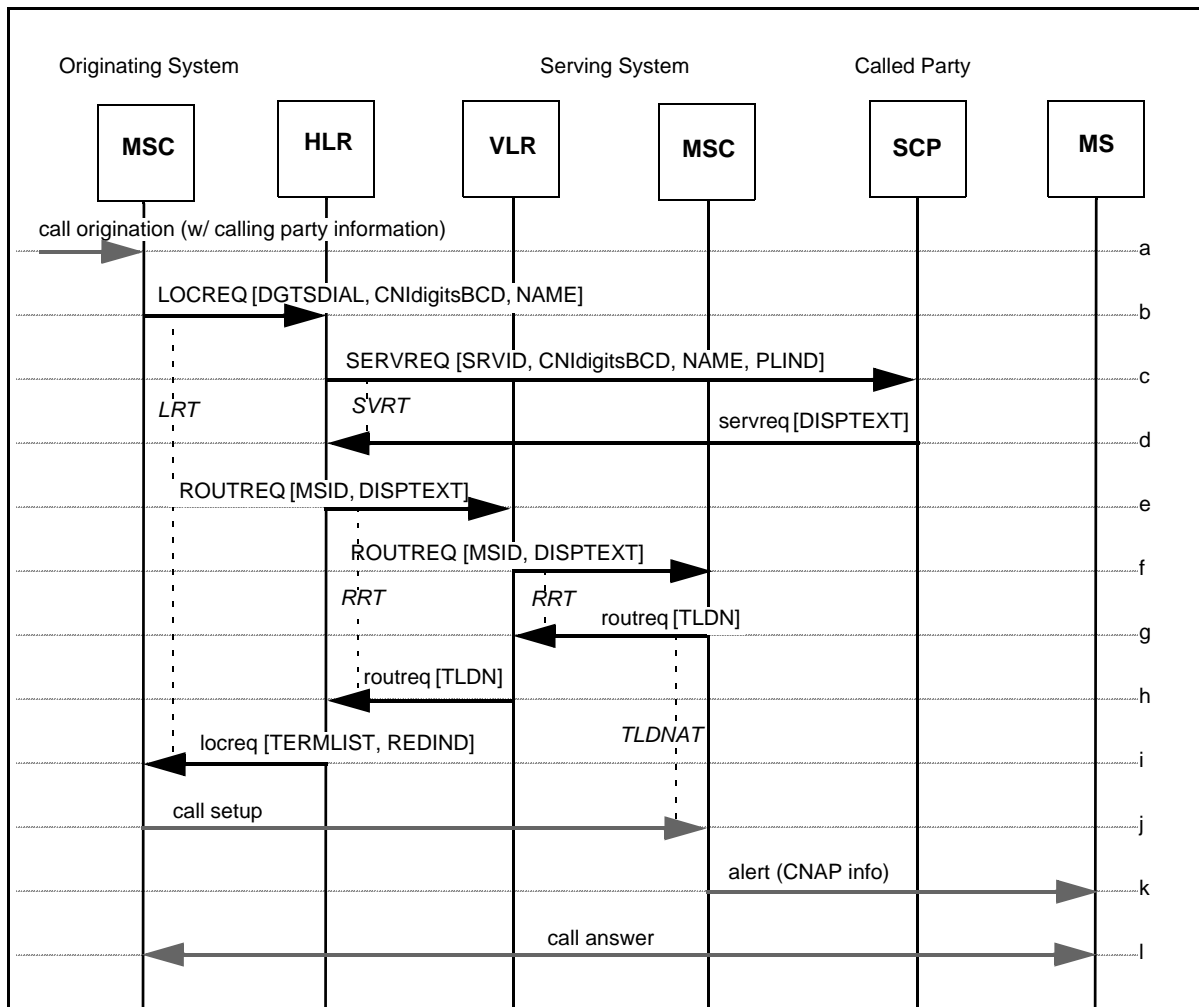


Figure 1 — CNAP Invocation to an Idle MS

- a. A call origination with dialed MS address digits (i.e., Directory Number) is received by the Originating MSC. Also included in the call origination are calling number identification (CNI) and, if delivered by the network, the calling name identification (CNA).

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- b. The Originating MSC sends a `LOCREQ` to the MS's HLR, including the CNI information. The CNA information is included if received at Step-a.

Parameters	Usage	Type
CNIldigitsBCD:	CNI digits parameters in BCD format:	R
[CPNDGTS1]	CallingPartyNumberDigits1. Calling number digits (network-provided), including presentation restriction information.	O
[CPNDGTS2]	CallingPartyNumberDigits2. Calling number digits (user-provided), including presentation restriction information.	O
[RNDGTS]	Redirecting number digits, including presentation restriction information.	O
DGTSDIAL	Digits identifying called party.	R
NAME:	The calling name identification parameters:	
[CGNAME]	CallingPartyName. The calling name identification of the original calling party, including presentation restriction information.	O
[RDNAME]	RedirectingPartyName. The calling name identification of the last redirecting party, including presentation restriction information.	O

- c. The HLR determines CNAP should be invoked and sends a `SERVREQ` to a Service Control Point (SCP) to obtain the text to present to the called subscriber. The `SERVREQ` includes the CNI information, and the CNA information if received at Step-b. The `SRVID` parameter is set to indicate whether the SCP shall execute the CNAP service or the CNAP and redirecting name display (RND) service. (Note: the HLR may obtain the text to present to the called subscriber from an alternate source in lieu of performing the `ServiceRequest` operation.)

Parameters	Usage	Type
SRVD	ServiceID. The identifier of the specific calling name presentation service for the SCP to execute.	R
CNIldigitsBCD:	CNI digits parameters in BCD format:	R
[CPNDGTS1]	CallingPartyNumberDigits1. Calling number digits (network-provided), including presentation restriction information.	O
[CPNDGTS2]	CallingPartyNumberDigits2. Calling number digits (user-provided, passed screening), including presentation restriction information.	O
[RNDGTS]	Redirecting number digits, including presentation restriction information.	O
NAME:	The calling name identification parameters:	
[CGNAME]	CallingPartyName. The calling name identification of the original calling party, including presentation restriction information.	O
[RDNAME]	RedirectingPartyName. The calling name identification of the last redirecting party, including presentation restriction information.	O

PLIND	The subscriber's preferred language.	O
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- d. The SCP sends the `servreq` to the HLR including the text to present to the called subscriber in the `DisplayText (DISPTEXT)` parameter. If the `CallingPartyName` parameter is not received in the `SERVREQ` and the calling party's number is marked as *presentation restricted*, the SCP may treat the calling party's name as *presentation restricted* as well. If the `CallingPartyName` parameter is not received in the `SERVREQ` and the calling party's number is marked as *presentation allowed*, the SCP may use the default presentation status of the calling party's name (as stored in the network). The SCP uses network-validated CNI information to identify the calling party. Network-validated is network-provided or user-provided (screening passed). (Note: the SCP may obtain the text to present to the called subscriber from an alternate database.)
- e. The HLR sends a `ROUTREQ` to the VLR where the MS is registered and includes the `DISPTEXT` parameter..

Parameters	Usage	Type
MIN	Called MS MIN.	R
DISPTEXT	Text for display by the MS.	R

- f. The VLR forwards the `ROUTREQ` to the current Serving MSC. Parameters are as in Step-e.
- g. In response 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 Temporary Local Directory Number (TLDN) and returns this information to the VLR in the `routreq`. The Serving MSC stores the received `DISPTEXT` parameter.
- h. The VLR sends the `routreq` to the HLR.
- i. When the `routreq` 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. The `DISPTEXT` parameter will be included for local termination.
- j. A connection is established between the Originating MSC and the Serving MSC using protocols defined by the interconnection method.
- k. When the inter-MS call is received at the Serving MSC, the MS is alerted. Included in the alert is the text received in the `DISPTEXT` parameter. When the VMS answers, it is connected to the served MS.
- l. When the served MS answers, the call is connected.

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2.2 CNAP Interaction with CW

This scenario describes CNAP invocation to a busy, authorized MS for which CNAP and CW are active.

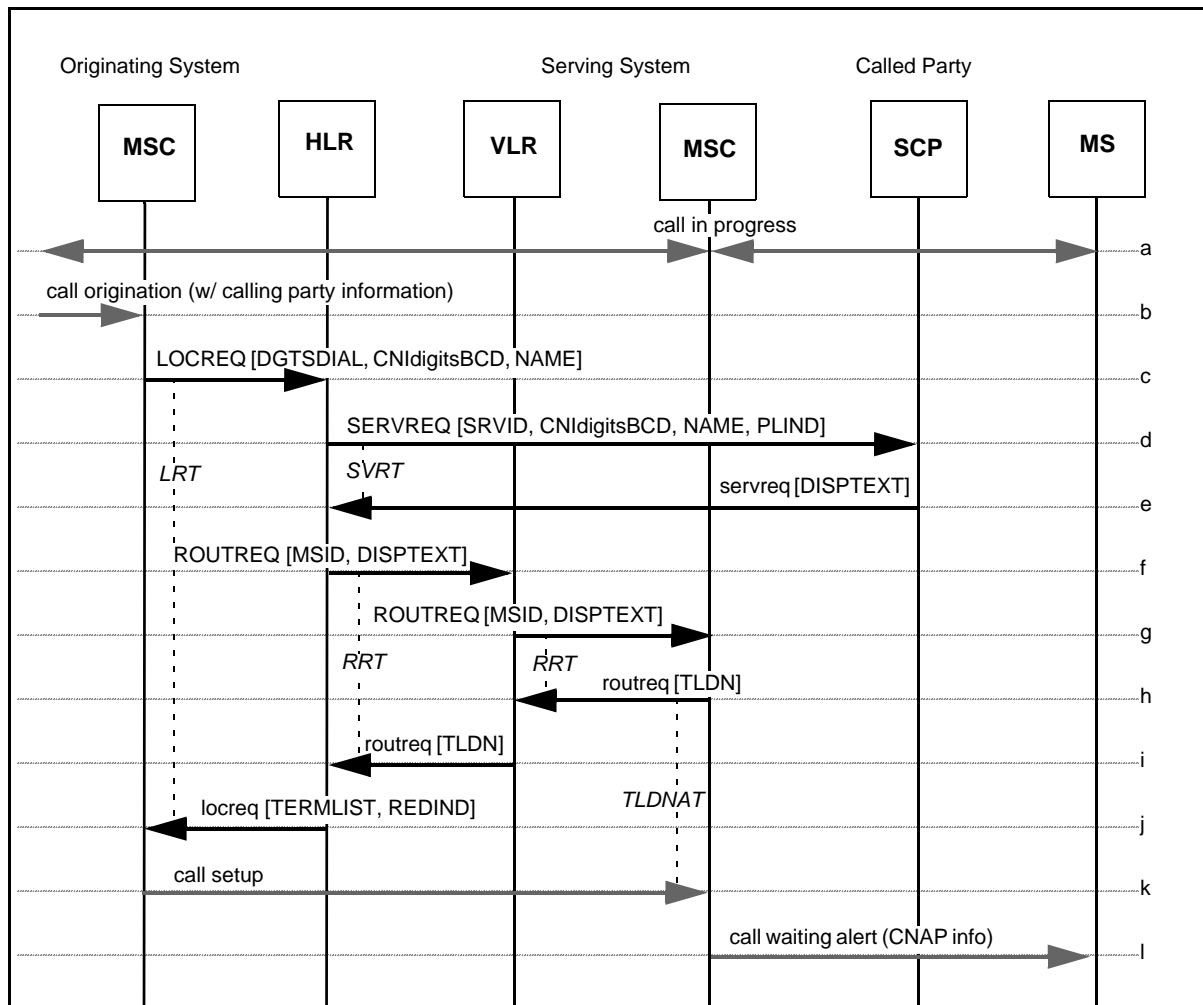


Figure 2 — CNAP Invocation to an Idle MS

- a. A call involving the served MS is in progress.
- b-g. Same as Section 2.1, Steps a-f respectively.
- h. In reaction to the ROUTREQ, the Serving MSC checks its internal data structures and determines that the MS is busy in another call but has CW active. Therefore, the Serving MSC allocates a TLDN (Temporary Local Directory Number) and returns this information to the VLR in the routreq. The Serving MSC stores the received DISPTXT parameter.
- i-k. Same as Section 2.1, Steps h-j respectively.
- l. When the (second) inter-MSC call is received at the Serving MSC, the Serving MSC provides the MS with a CW notification. Included in the notification is the text received in the DISPTXT parameter.

2.3 CNAP Interaction with CW After Handoff

This scenario describes CNAP invocation to a busy, authorized MS for which CNAP and CW are active, after intersystem handoff of the MS.

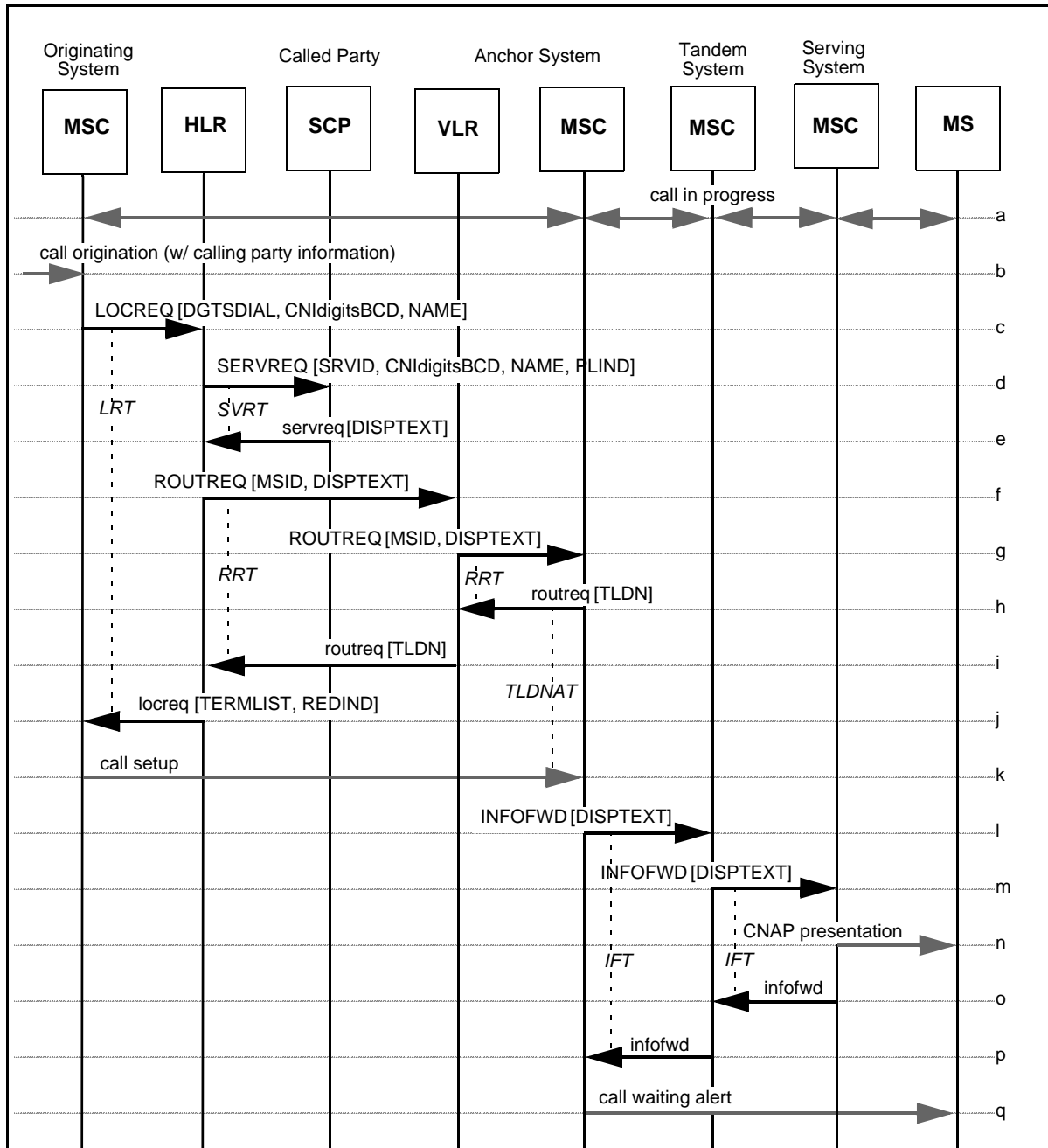


Figure 3 — CNAP Invocation to an Idle MS

- a. A call involving the served MS is in progress.
- b-g. Same as Section 2.1, Steps a-f respectively.

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- h. In reaction to the ROUTREQ, the Serving MSC checks its internal data structures and determines that the MS is busy in another call but has CW active. Therefore, the Serving MSC allocates a TLDN (Temporary Local Directory Number) and returns this information to the VLR in the routreq. The Serving MSC stores the received DISPTXT parameter.
- i-k. Same as [Section 2.1](#), Steps h-j respectively.
- l. The Anchor MSC then sends an INFOFWD to the Tandem MSC, including the DISPTXT parameter.
- m. The Tandem MSC forwards the INFOFWD to the Serving MSC.
- n. The Serving MSC presents the text received in the DISPTXT parameter to the served MS.
- o. The Serving MSC acknowledges receipt by sending an infofwd to the Tandem MSC.
- p. The Tandem MSC forwards the infofwd to the Anchor MSC.
- q. The Anchor MSC provides the MS with a Call Waiting notification.

2.4 CNAP Interaction with CFU

This scenario describes CNAP invocation to an authorized MS for which CNAP and CFU are active.

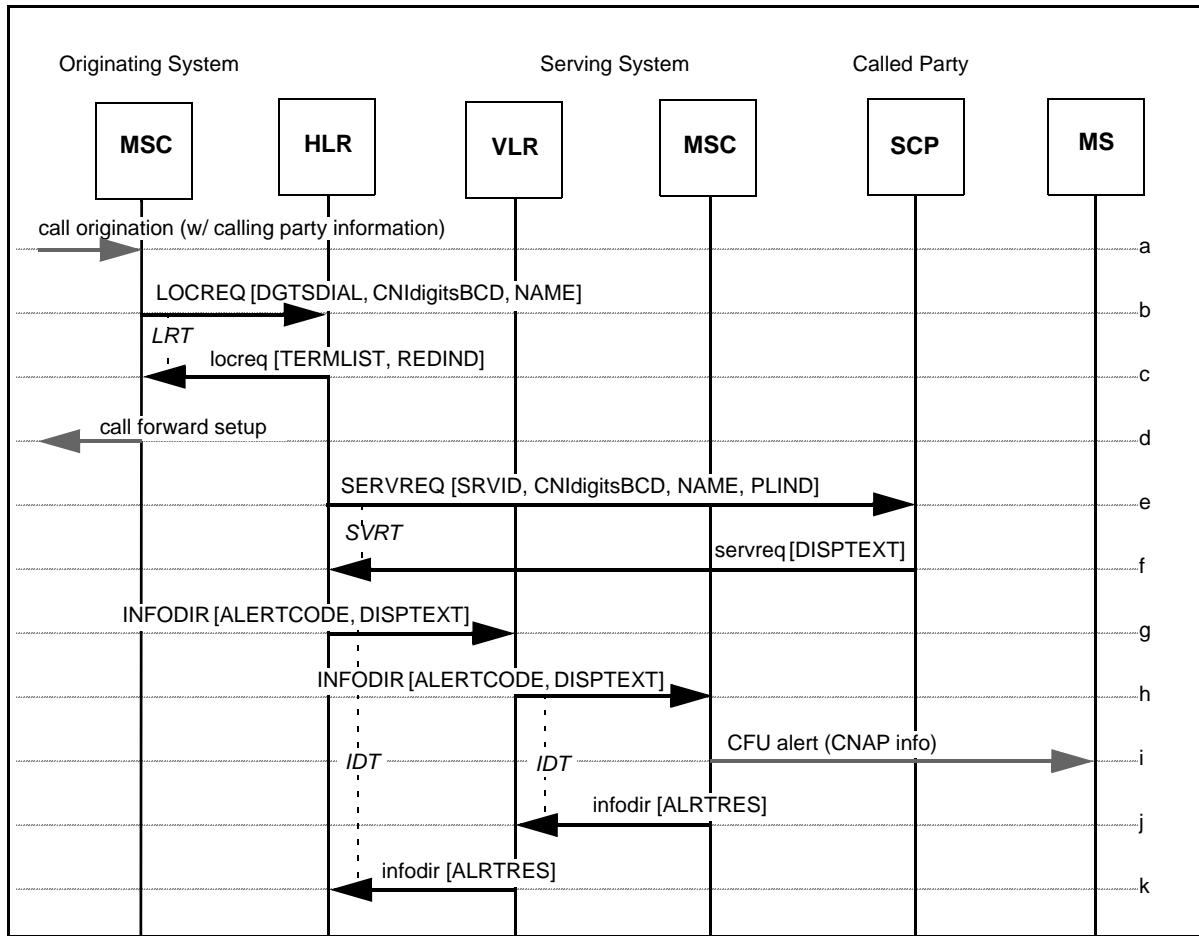


Figure 4 — CNAP Invocation to an Idle MS

- a-b. Same as [Section 2.1](#), Steps a-b respectively.
- c. The HLR determines that CFU is active for the called subscriber. It sends a `locreq` to the Originating MSC providing the forward-to number and other routing information in the `TerminationList` parameter, along with an indication of the reason for extending the incoming call (i.e., for CFU) in the `DMH_RedirectionIndicator` parameter.
- d. The Originating MSC then forwards the call to the specified forward-to number, including any received calling party identity information and updated last redirecting party number information.
- e. If the HLR determines that the MS should be informed that a call has been forwarded unconditionally and that CNAP should be invoked, it sends a `SERVREQ` to a Service Control Point (SCP) to obtain the calling name information to present to the called subscriber. The `SERVREQ` includes any network validated CNI information, and the CNA information if received at Step-b. The `SRVID` parameter is set to indicate whether the SCP shall execute the CNAP service or the CNAP and redirecting name display (RND) service. (Note: the HLR may obtain the text to present to the called subscriber from an alternate database.)

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Parameters	Usage	Type
SRVD	ServiceID. The identifier of the specific calling name presentation service for the SCP to execute.	R
CNIldigitsBCD: [CPNDGTS1] [CPNDGTS2] [RNDGTS]	CNI digits parameters in BCD format: CallingPartyNumberDigits1. Calling number digits (network-provided), including presentation restriction information. CallingPartyNumberDigits2. Calling number digits (user-provided, passed screening), including presentation restriction information. Redirecting number digits, including presentation restriction information.	R O O O
NAME: [CGNAME] [RDNAME]	The calling name identification parameters: CallingPartyName. The calling name identification of the original calling party, including presentation restriction information. RedirectingPartyName. The calling name identification of the last redirecting party, including presentation restriction information.	 O O
PLIND	The subscriber's preferred language.	O

- f. The SCP sends the `servreq` to the HLR including the text to present to the called subscriber in the `DisplayText (DISPTEXT)` parameter. If the `CallingPartyName` parameter is not received in the `SERVREQ` and the calling party's number is marked as *presentation restricted*, the SCP may treat the calling party's name as *presentation restricted* as well. If the `CallingPartyName` parameter is not received in the `SERVREQ` and the calling party's number is marked as *presentation allowed*, the SCP may use the default presentation status of the calling party's name (as stored in the network). The SCP uses network-validated CNI information to identify the calling party. Network-validated is network-provided or user-provided (screening passed). (Note: the SCP may obtain the text to present to the called subscriber from an alternate database.)

Parameters	Usage	Type
DISPTEXT	Text for display by the MS.	R

- g. The HLR sends an `INFODIR` to the VLR where the MS is registered, including the `DISPTEXT` parameter.
- h. The VLR directs the Serving MSC to alert the served MS by sending an `INFODIR` to the Serving MSC.
- i. The Serving MSC alerts the MS, if idle, via the alerting method specified in the `AlertCode` parameter in the received `INFODIR`; in this case, the MSC applies a single, abbreviated alert signal to the MS and waits to report paging success or failure. Included in the alert is the text received in the `DISPTEXT` parameter.
- j. The Serving MSC sends an `infodir` to the VLR, including the result of the alerting action (e.g., success, not attempted due to MS busy condition).
- k. The VLR forwards the `infodir` to the HLR.

2.5 CNAP Interaction with CFU after Handoff

This scenario describes CNAP invocation to an authorized MS for which CNAP and CFU are active, after intersystem handoff of the MS.

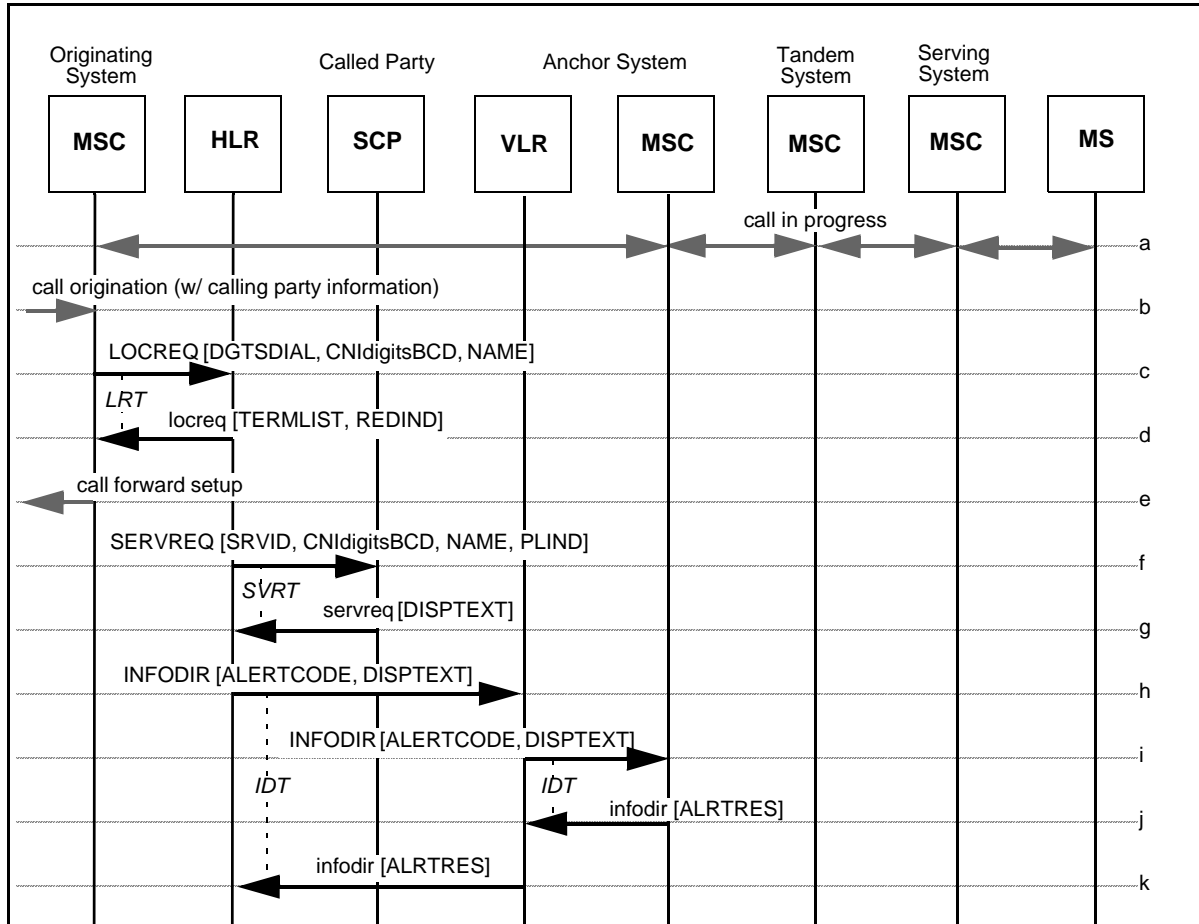


Figure 5 — CNAP Interaction with CFU After Handoff

- a. A call involving the served MS is in progress.
- b-i. Same as Section Section 2.5, Steps a-h, respectively.
- j. Since the MS is busy, the Anchor MSC sends an *infodir* to the VLR, including the result of the alerting action (i.e., not attempted due to MS busy condition).
- k. The VLR forwards the *infodir* to the HLR.

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2.6 CNAP with Intersystem Paging

This scenario describes CNAP invocation involving intersystem paging from the serving system to border systems. Intersystem paging may help overcome location uncertainties in border system areas allowing paging to be performed in border systems and by performing call routing towards the system where the subscriber is found.

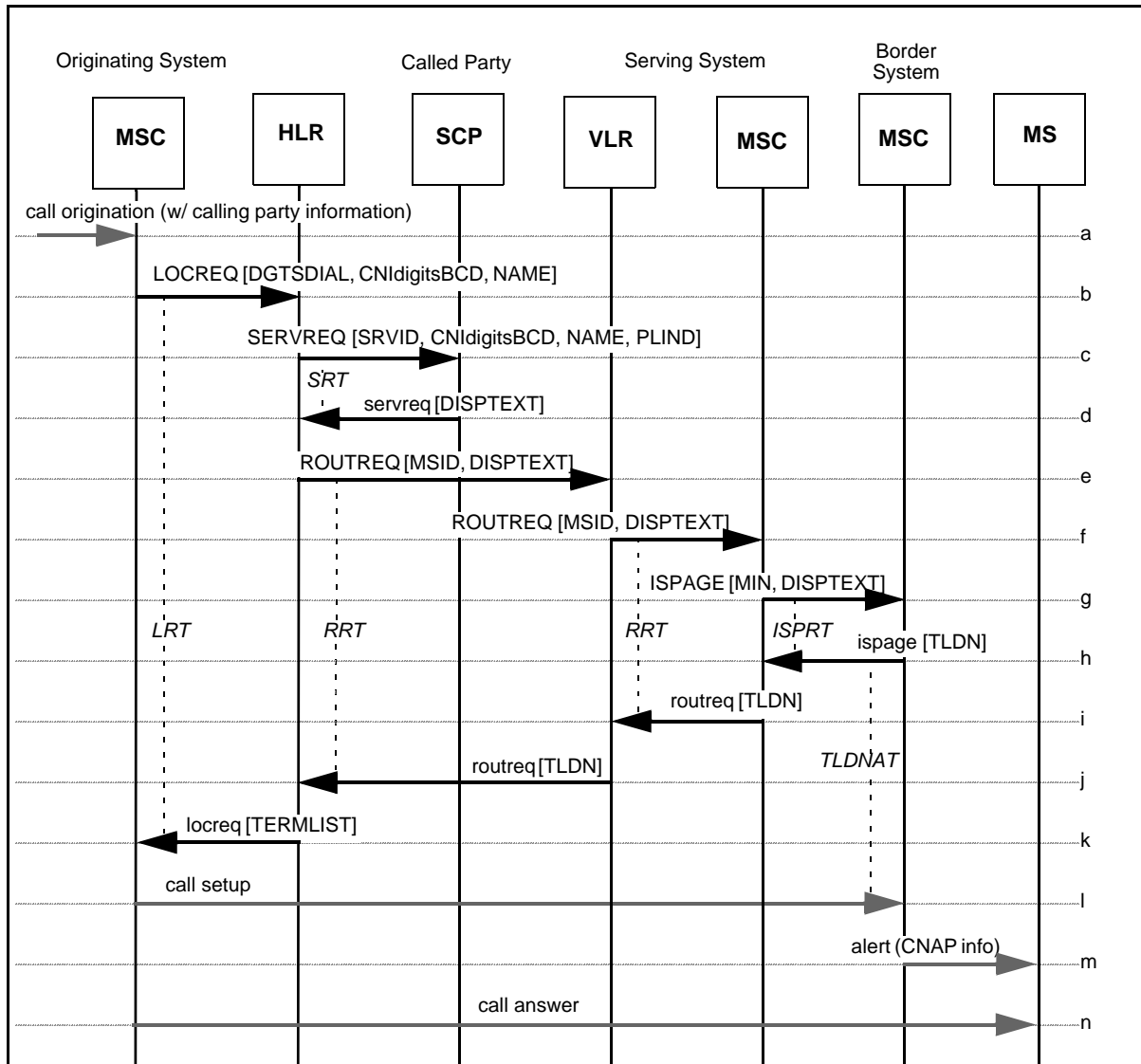


Figure 6 — CNAP with Intersystem Page

- a-f. Same as Section 2.1, Steps a-f.
- g. Before initiating local paging, at the time of local page initiation or after first page time-out, the Serving MSC may send an ISPAGE to one or more bordering MSCs according to its “topographical map” with the DisplayText parameter received in Step-f. The Border MSC that receives the ISPAGE may initiate paging (i.e., if directed).
- h. If a page response is received at the Border MSC, and if the MS is authentication capable, optionally authenticate the MS. When the Border MSC assigns the MS to a voice/traffic channel, the Border MSC sends an ispague containing a TLDN and the MSCID of the Border MSC to the Serving MSC.

- i. The Serving MSC returns a `routreq` to the Serving VLR with the TLDN contained in the `ispage`
- j. The Serving VLR returns the `routreq` to the HLR.
- k. The HLR then sends 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.
- l. The Originating MSC establishes a voice path to the Border MSC using existing interconnection protocols (e.g. SS7) and the routing information specified in the `locreq`.
- m. When the inter-MSC call is received at the Border MSC, the MS is alerted. Included in the alert is the text received in the `DISPTXT` parameter.
- n. When the served MS answers, the call is connected.

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2.7 CNAP with TLDN Call Arrival and Intersystem Paging

This scenario describes CNAP invocation for TLDN Call Arrival at the serving system involving intersystem paging from the serving system to border systems.

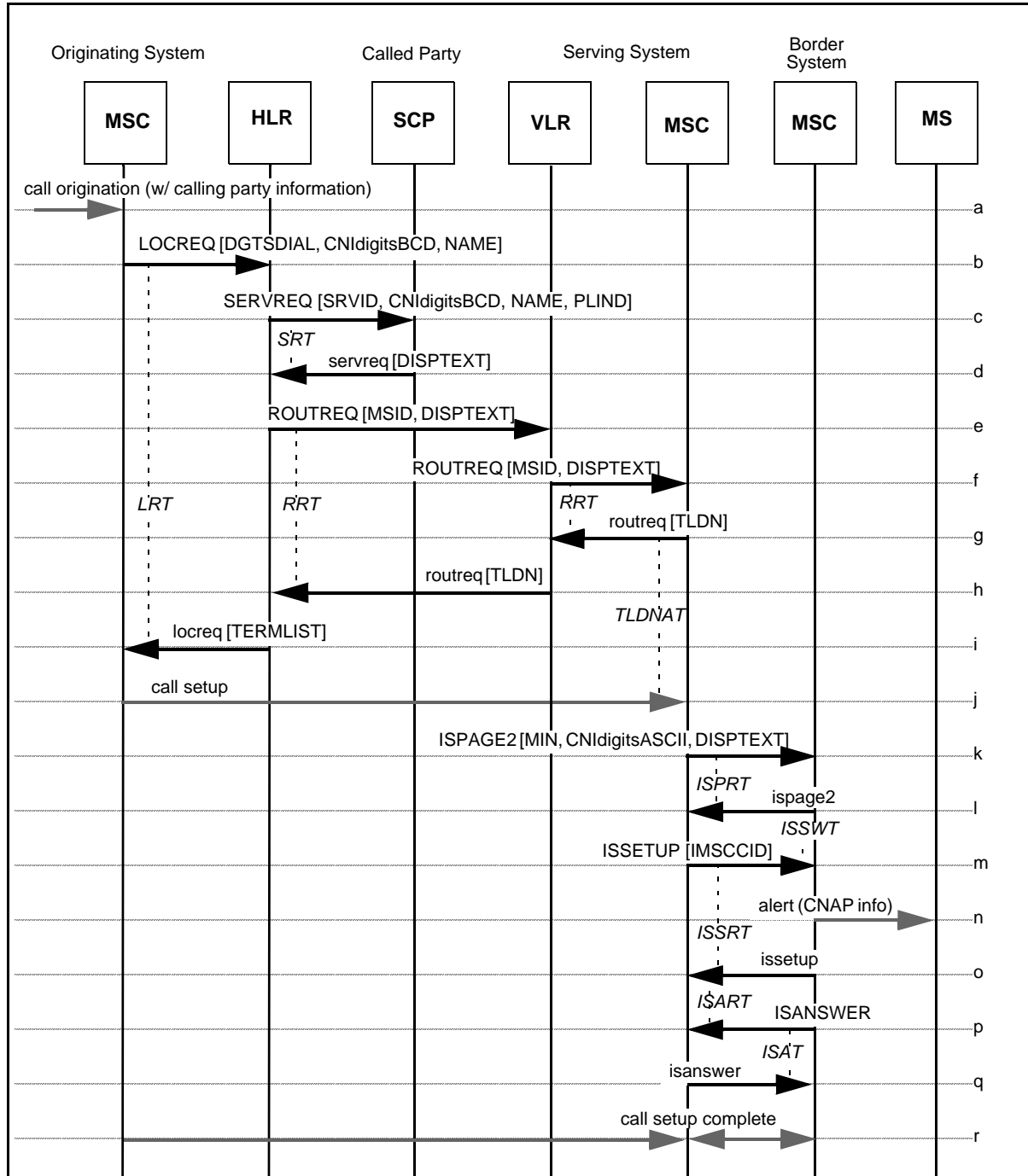


Figure 7 — CNAP with TLDN Call Arrival and Intersystem Page

a-j. Same as Section 2.1, Steps a-j.

- k. Before initiating local paging, at the time of local page initiation or after first page time-out, the Serving MSC may send an `ISPAGE2` to one or more bordering MSCs according to its “topographical map” with the `DisplayText` parameter received in Step-f.
The Border MSC that receives the `ISPAGE2` may initiate paging (i.e., if directed).
- l. If a page response is received at the Border MSC, the Border MSC sends an `ispage2` to the Serving MSC. If the MS is authentication capable, the Border MSC includes applicable authentication parameters in the `ispage2`.
- m. The Serving MSC sends an `ISSETUP` to the Border MSC including the `IMSCCID` parameter to indicate the intersystem trunk assignment.
- n. The Border MSC sends an Alert with the `CNAP` information to the MS.
- o. The Border MSC sends an `issetup` to the Serving MSC.
- p. When the MS answers, the Border MSC sends an `ISANSWER` to the Serving MSC.
- q. The Serving MSC sends an `isanswer` to the Border MSC.
- r. The Serving MSC completes the call setup to the Border MSC.

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2.8 CNAP with Unsolicited Page Response

This scenario describes CNAP invocation for an unsolicited page response from a border system to the serving system.

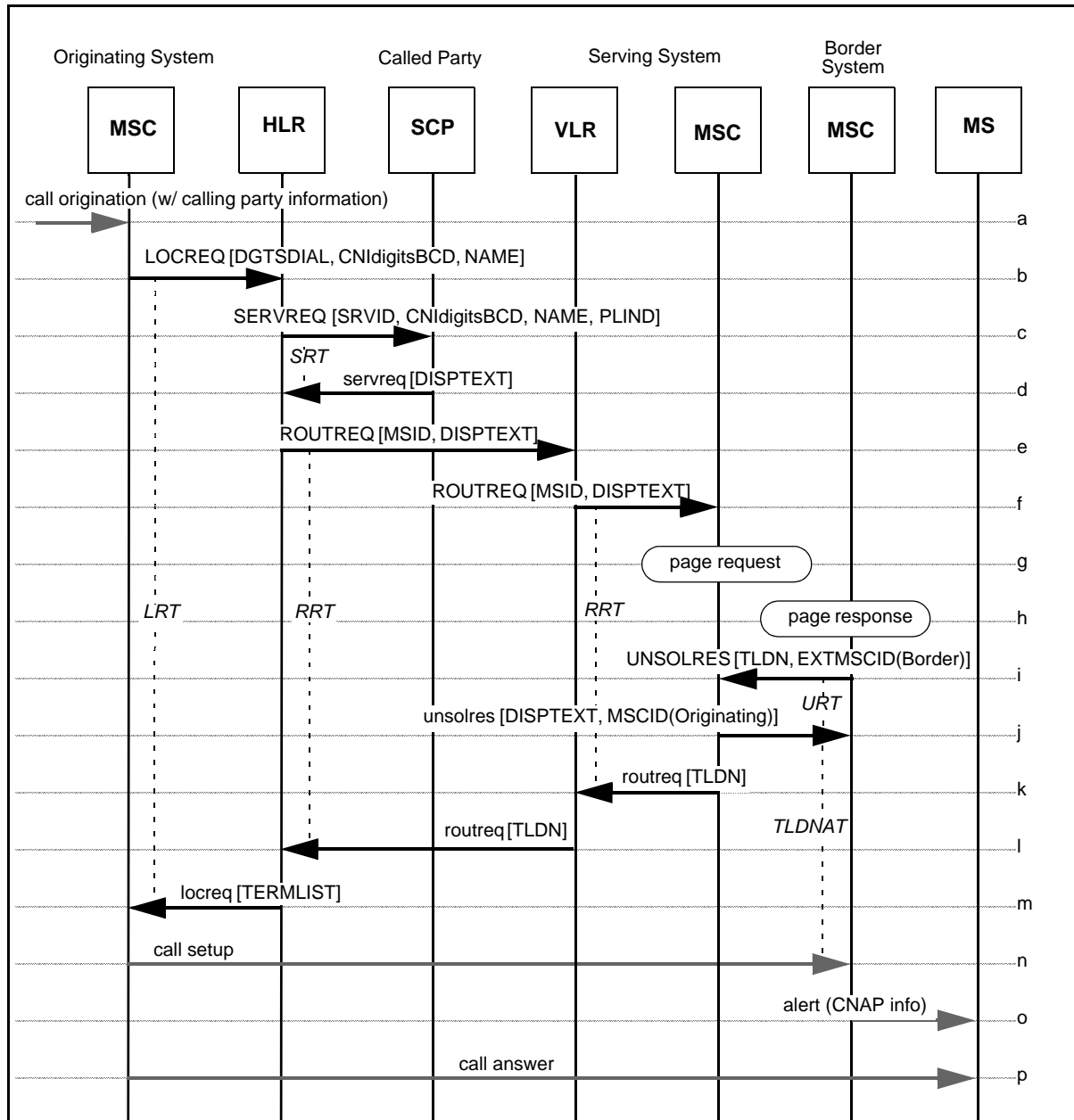


Figure 8 CNAP with Unsolicited Page Response

- a-f. Same as Section 2.1, Steps a-f.
- g. When the Serving MSC receives the ROUTREQ it initiates paging in its serving area.
- h. The Border MSC receives an unsolicited page response.
- i. The Border MSC sends an UNSOLRES containing a TLDN and the MSCID of the Border MSC to the Serving MSC. If the MS is authentication capable, the Border MSC includes applicable authentication parameters in the UNSOLRES.

- j. The Serving MSC sends an `unsolres` including the `DisplayText` and `MSCID` (Originating) parameters to the Border MSC.
- k. The Serving MSC returns a `routreq` to the Serving VLR with the `TLDN` received in the `UNSOLRES` and the `MSCID` of the Border MSC.
- l. The Serving VLR returns the `routreq` to the HLR.
- m. The HLR then sends a `locreq` to the Originating MSC. The `locreq` includes routing information in the form of the `TerminationList` parameter.
- n. The Originating MSC establishes a voice path to the Border MSC using existing interconnection protocols (e.g., `SS7`) and the routing information specified in the `locreq`.
- o. When the inter-MSC call is received at the Border MSC, the MS is alerted. Included in the alert is the text received in the `DisplayText` parameter.
- p. When the served MS answers, the call is connected.

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3 Calling Name Restriction

This section depicts the interactions between network entities in various situations related to automatic roaming and Calling Name Restriction (CNAR). These scenarios are for illustrative purposes only.

3.1 CNAR Variable Per-Call Mode Operation

This scenario describes the Variable Per-Call Mode activation or de-activation of CNAR by an authorized MS. The activation or de-activation occurs coincident with a call request.

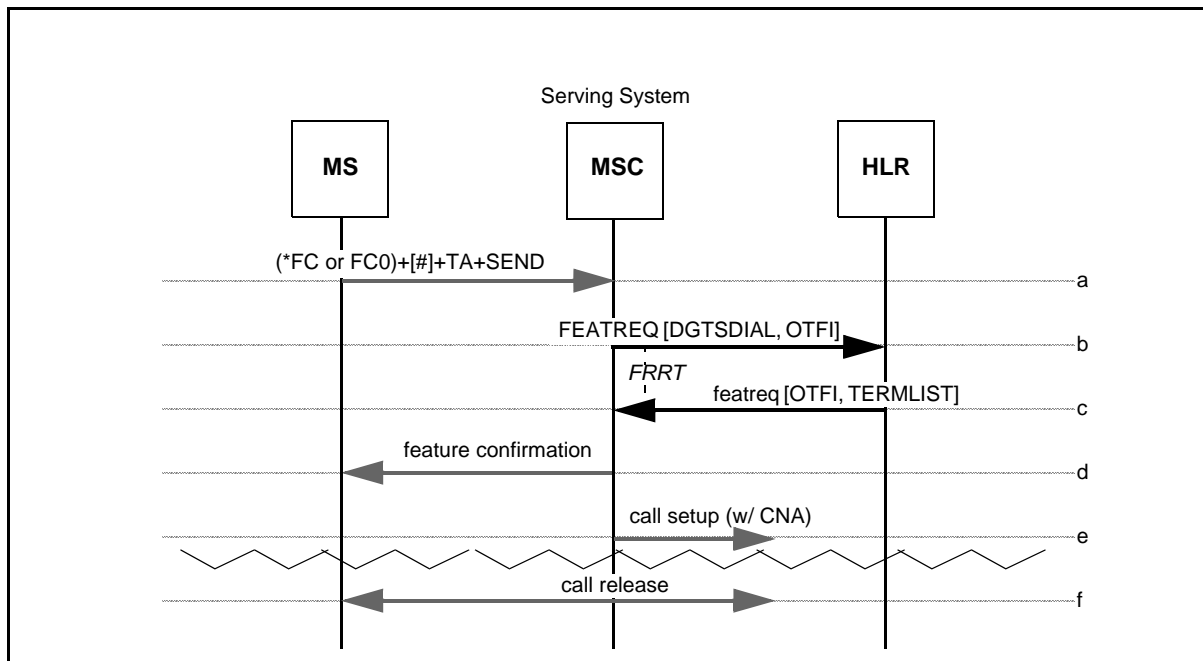


Figure 9 — CNAR Variable Per-Call Mode Operation

- a. A call origination and dialed digits are received by the Serving MSC. During analysis of the dialed digits, the Serving MSC detects a feature code string.
- b. The dialed digits are included in a FEATREQ and sent from the Serving MSC to the HLR associated with the MS. The Serving MSC includes the OneTimeFeatureIndicator (OTFI) parameter if any of its status bits are set (i.e., if any special feature processing is active for the call).

Additional Parameters	Usage	Type
OTFI (Current Call)	Indicates special feature processing active for duration of call in progress.	O

- c. The HLR detects the authorized CNAR request and sends a `featreq` to the Serving MSC. The `featreq` includes call routing information in the `TerminationList` parameter. It also includes the OTFI parameter, with an indication that CNAR is either activated, de-activated or toggled for the call.

Additional Parameters	Usage	Type
OTFI (Current Call)	Modify feature processing for duration of call in progress.	R

- d. The Serving MSC stores the CNAR OTFI, activates, de-activates or toggles CNAR, and provides treatment to the served MS as indicated in the `featreq`. In this case, the treatment is to apply feature confirmation.
- e. The Serving MSC extends the call using the call routing information in the `TerminationList` parameter. The Serving MSC includes the calling information indicating the presentation status applicable for the call.

Note: If the Serving MSC extends the call using ISUP trunk signaling, it includes CNA in the Generic Name parameter of the Initial Address Message. The presentation field of the Generic Name parameter is set to indicate the presentation status for the call.

- f. The CNAR OTFI remains active until the end of the call, at which time it is discarded by the Serving MSC. The calling name presentation restriction status then returns to its pre-call condition.