

3GPP2 X.S0004-372-E

v 1.0

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3RD GENERATION  
PARTNERSHIP  
PROJECT 2  
"3GPP2"

## Mobile Application Part (MAP) -

### BORDER MSC SMS SCENARIOS

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# REVISION HISTORY

Revision	Date	Remarks
X.S0004-372-E v1.0	January 2009	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.

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 SMS delivery to Border MSC

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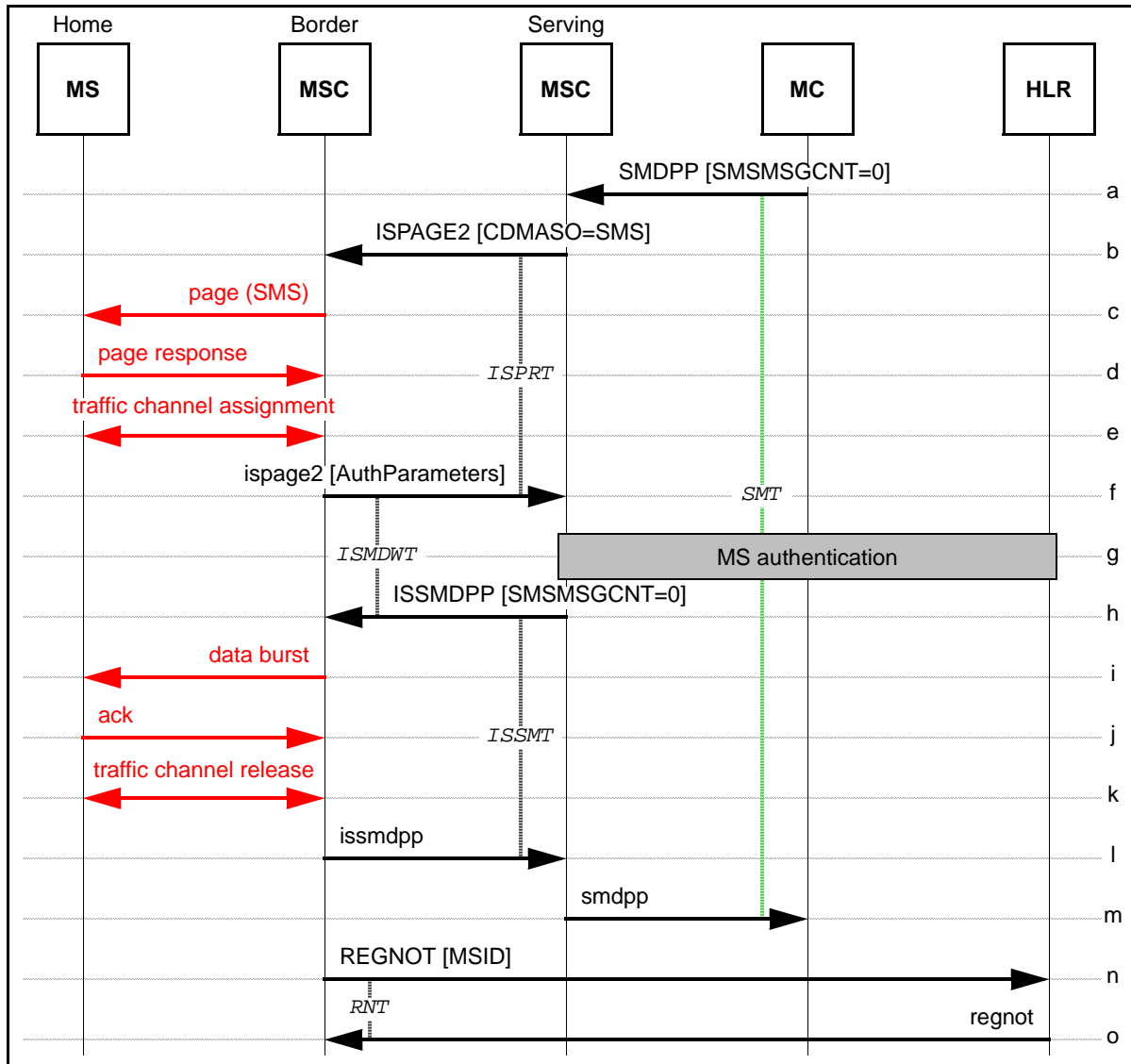
This section depicts the interactions between network entities in various situations related to the delivery of SMS messages to an MS that responds to a page in a Border MSC. These scenarios are for illustrative purposes only.

### 2.1 Border MSC SMS Termination - Successful Delivery of Single Message to MS-Based SME

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This scenario illustrates successful delivery of an SMS message to an MS-based SME that is located in a Border MSC at the time of the delivery attempt. The Message Center indicates that there are no SMS messages pending.

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**Figure 1 Border MSC SMS Termination - Successful Delivery of Single Message to MS-Based SME**

- a. The MC initiates an “SMS termination to MS-based SME” by sending an SMDPP to the network address of record for the destination MS. The MC sets the SMSMSGCNT parameter to zero to indicate that there is a single message to deliver.
- b. Upon receipt of the SMDPP, the Serving MSC pages the destination MS both locally and, since the MS last registered while on or near the system border, in a single Border MSC by means of an ISPAGE2. The Serving MSC sets the CDMASO parameter in to indicate the SMS service.
- c. The Border MSC pages the indicated MS with the SMS CDMA service option.
- d. The MS responds to the page.
- e. The Border MSC assigns the MS to a traffic channel.

1 Note: From the network perspective, the receipt of the page response and the assignment  
2 of the MS to a traffic channel is regarded as an implicit registration event.

3 f. The Border MSC returns an `ispage2` to the Serving MSC. If authentication is to be  
4 performed, the `ispage2` contains the appropriate authentication parameters received from  
5 the MS. The Border MSC sets the ISMDWT timer in anticipation of the receipt of an  
6 ISSMDPP

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8 g. If authentication is indicated, the Serving MSC initiates MS authentication procedures.

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10 h. The Serving MSC sends an ISSMDPP to the Border MSC to with the SMS message. The  
11 SMSMSGCNT parameter is set to zero indicating that no further message deliveries belong  
12 to this delivery context.

13 Note: The absence of the SMSMSGCNT parameter in the ISSMDPP also indicates that no  
14 additional messages remain to be delivered.

15 i. The Border MSC delivers the SMS message to the destination MS.

16 j. The MS acknowledges receipt of the SMS message.

17 k. The Border MSC releases the MS from the traffic channel.

18 l. The Border MSC returns an `issmdpp` to the Serving MSC.

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20 m. The Serving MSC returns an `smdpp` to the MC.

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22 n. The Border MSC sends a REGNOT toward the MS's HLR to register the MS.

23 Note: the Border MSC may initiate registration notifications procedures at any time after  
24 Step-h.

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26 o. The HLR returns a `regnot` to the Serving VLR/MS.

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## 2.2 Border MSC SMS Termination - Successful Delivery of Multiple Messages

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This scenario illustrates successful delivery of an SMS message, with a message pending, to an MS-based SME that is located in a Border MSC at the time of the delivery attempt.

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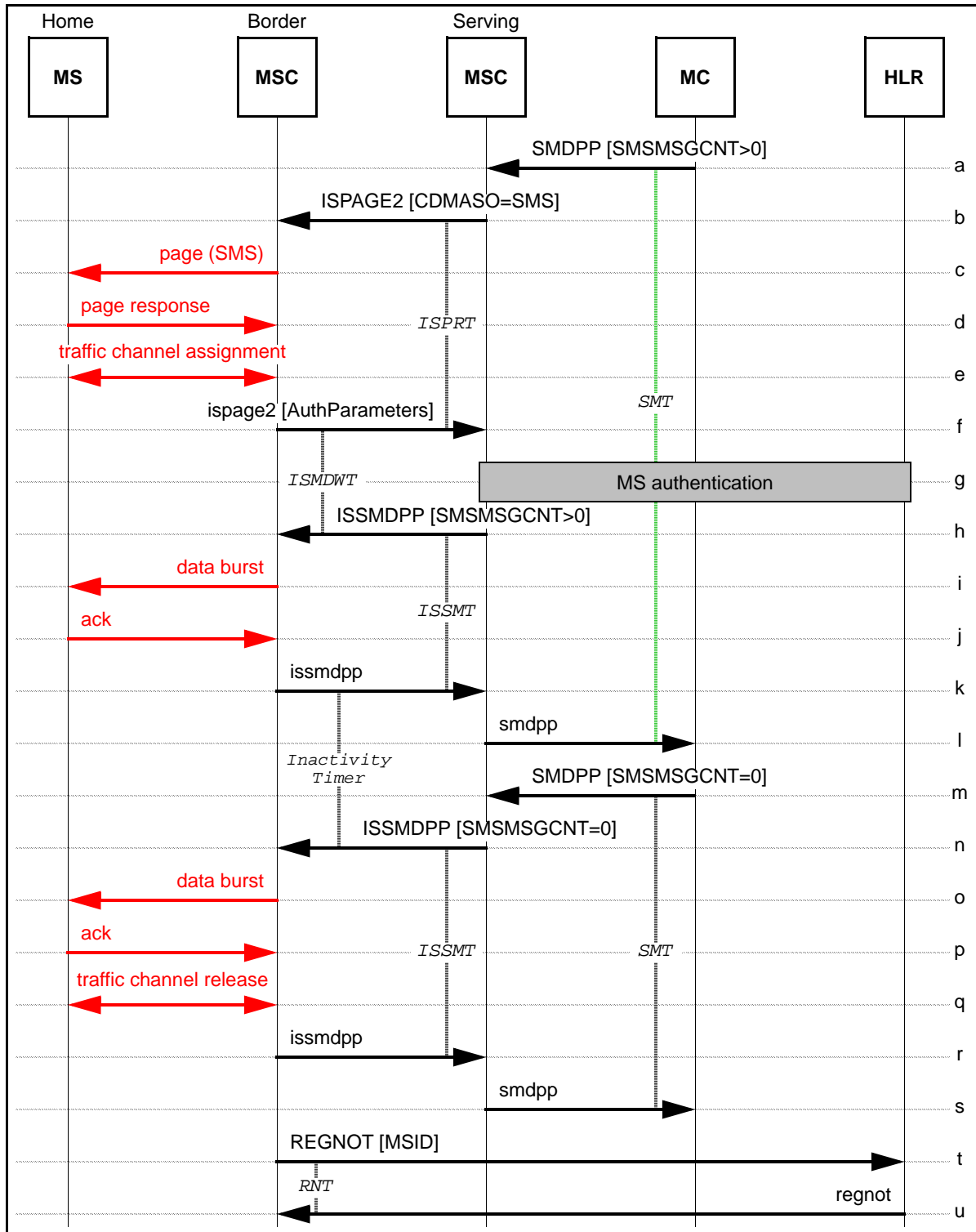
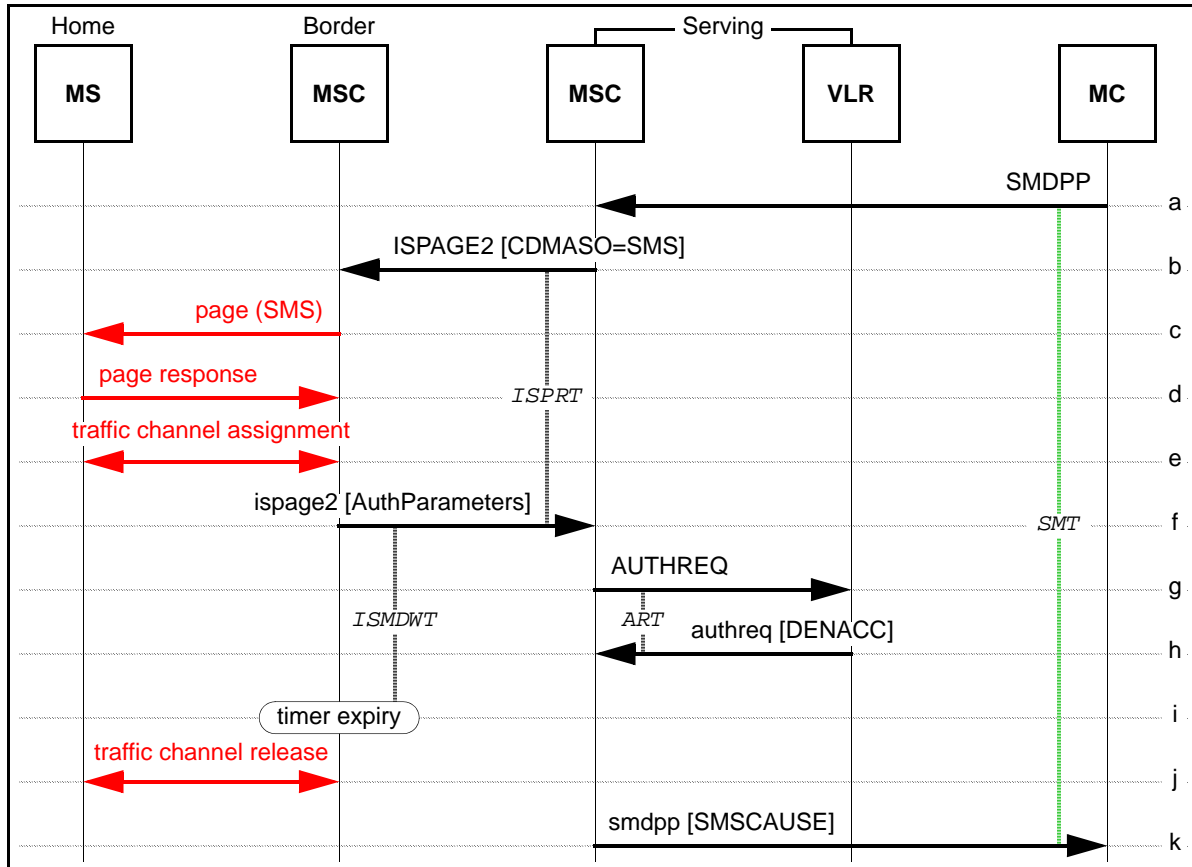


Figure 2 Border MSC SMS Termination - Successful Delivery of Multiple Messages

- a. The MC initiates an “SMS termination to MS-based SME” by sending an SMDPP to the network address of record for the destination MS. The MC sets the SMSMSGCNT parameter to a value greater than zero to indicate that there are multiple messages to deliver. 1  
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- b. Upon receipt of the SMDPP, the Serving MSC pages the destination MS both locally and, since the MS last registered while on or near the system border, in a single Border MSC by means of an ISPAGE2. The Serving MSC sets the CDMASO parameter in to indicate the SMS service. 4  
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- c. The Border MSC pages the indicated MS with the SMS CDMA service option. 9
- d. The MS responds to the page. 10
- e. The Border MSC assigns the MS to a traffic channel. 11  
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- Note: From the network perspective, the receipt of the page response and the assignment of the MS to a traffic channel is regarded as an implicit registration event. 13  
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- f. The Border MSC returns an ispage2 to the Serving MSC. If authentication is to be performed, the ispage2 contains the appropriate authentication parameters received from the MS. The Border MSC sets the ISMDWT timer in anticipation of the receipt of an ISSMDPP 15  
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- g. If authentication is indicated, the Serving MSC initiates MS authentication procedures. 20
- h. The Serving MSC sends an ISSMDPP to the Border MSC to with the SMS message. The SMSMSGCNT parameter is set to the value received from the MC. 21  
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- i. The Border MSC delivers the SMS message to the destination MS. 24
- j. The MS acknowledges receipt of the SMS message. 25
- k. The Border MSC returns an issmdpp to the Serving MSC. 26
- l. The Serving MSC returns an smdpp to the MC. 27
- m. The MC sends another SMDPP to the registered MSC for the MS-based SME. The MC sets the SMSMSGCNT parameter to zero. 28  
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- n. The Serving MSC sends an ISSMDPP to the Border MSC to with the SMS message. The SMSMSGCNT parameter is set to zero to indicate that there are no more messages to deliver. 32  
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- o. The Border MSC delivers the SMS message to the destination MS. 36
- p. The MS acknowledges receipt of the SMS message. 37
- q. The Border MSC releases the MS from the traffic channel. 38
- r. The Border MSC returns an issmdpp to the Serving MSC. 39
- s. The Serving MSC returns an smdpp to the MC. 40  
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- t. The Border MSC sends a REGNOT toward the MS’s HLR to register the MS. 42  
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- Note: the Border MSC may initiate registration notifications procedures at any time after Step-h. 44  
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- u. The HLR returns a regnot to the Serving VLR/MSC. 46  
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## 2.3 Unsuccessful Delivery of SMS Message to MS in Border MSC: Authentication Failure

This scenario illustrates unsuccessful delivery of an SMS message to an MS in a Border MSC due to an authentication failure.



**Figure 3 Unsuccessful Delivery of SMS Message to MS in Border MSC: Authentication Failure**

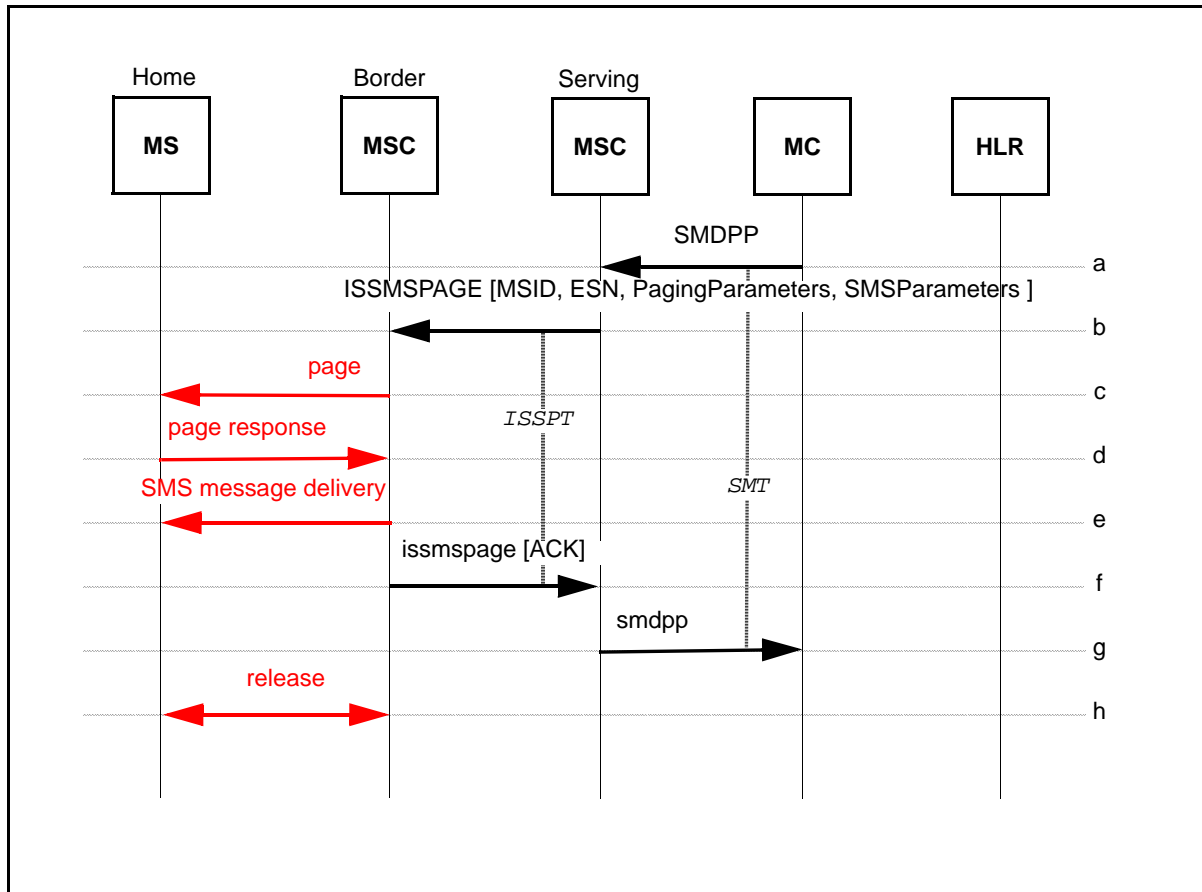
- a. The MC initiates an “SMS termination to MS-based SME” by sending an SMDPP to the network address of record for the destination MS.
- b. The Serving MSC pages the destination MS both locally and, since the MS last registered while on or near the system border, in a single Border MSC by means of an ISPAGE2. The Serving MSC sets the CDMASO parameter in to indicate the SMS service.
- c. The Border MSC pages the indicated MS with the SMS CDMA service option.
- d. The destination MS responds to the page.
- e. The Border MSC assigns the MS to a traffic channel.
- f. The Border MSC returns an ispage2 to the Serving MSC. The ispage2 contains the appropriate authentication parameters received from the MS. The Border MSC sets the ISMDWT timer in anticipation of the receipt of an ISSMDPP
- g. Authentication is applicable for the MS. The Serving MSC sends an AUTHREQ to the VLR and includes the authentication parameters received from the MS.
- h. The VLR authenticates the MS service access (i.e., page response) and detects an authentication failure. The VLR includes the DENACC parameter in the authreq sent to the MSC.

- i. The Border MSC's ISMDWT timer expires for the MS.
- j. The Border MSC releases the MS from the traffic channel.  
Note: the Border MSC will not initiate registration notification procedures for the MS at this time. The Border MSC may initiate these procedures the next time the MS is detected.
- k. If the destination MS is not detected in any other service area, the Serving MSC sends an `smcnp` to the MC with the `SMSCAUSE` parameter set appropriately.

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## 2.4 Border MSC SMS Termination - Successful Delivery of a Message to MS-Based SME via the Paging Channel

This scenario illustrates successful delivery of an SMS message via the paging channel to an MS-based SME that is located in a Border MSC at the time of the delivery attempt. This scenario uses the InterSystemSMSPage (ISSMSPAGE) operation and assumes that the BS first pages the MS to determine its location followed by delivery of the SMS message on the responding sector.



**Figure 4 Border MSC SMS Termination - Successful Delivery of a Message to MS-Based SME via the Paging Channel**

- a. The MC initiates an “SMS termination to MS-based SME” by sending an SMDPP to the network address of record for the destination MS.
- b. Upon receipt of the SMDPP that is destined for an MS that may be in a neighboring MSC’s coverage area, the Serving MSC sends an ISSMSPAGE to the Border MSC.
- c. The Border MSC pages the MS locate it.
- d. The MS responds to the page
- e. Based on the sector where the page was received, the Border MSC sends the SMS message to the MS on the applicable sector(s).
- f. The Border MSC returns an issmspage to the Serving MSC, indicating a positive acknowledgment of the operation invocation.
- g. The Serving MSC returns an smdpp to the MC indicating successful delivery of the SMS message.

h. Anytime after Step e, the Border MSC releases the MS to return it to the idle state.

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