3GPP TSG CN Meeting #27 **NP-050071**
9th - 11th March 2005. Tokyo, Japan.

Source: **TSG CN WG1**

Title: **CR to Rel-6 WI "MBMS" and "TEI6" for TS 24.008**

Agenda item: **9.8**

Document for: **APPROVAL**

This document contains 3 **CRs on Rel-6 Work Item "MBMS" and "TEI6"**, that have been agreed by TSG CN WG1 CN#37 meeting and forwarded to TSG CN Plenary meeting #27 for approval.

TDoc #	Tdoc Title	Spec	CR #	Rev	CAT	C_Version	WI	Rel
N1-050307	Synchronization of MBMS context status between UE and SGSN	24.008	931	1	B	6.7.0	MBMS	Rel-6
N1-050308	MBMS Session Management clarifications	24.008	954	1	F	6.7.0	MBMS	Rel-6
N1-050309	Introduction of MBMS in clause 8	24.008	956	1	B	6.7.0	MBMS,TEI6	Rel-6

3GPP TSG-CN1 Meeting #37
Sydney, Australia, 14-18 February 2005

Tdoc N1-050307
(rev of Tdoc N1-050046)

CR-Form-v7.1

CHANGE REQUEST

⌘ **24.008** **CR** **931** ⌘ **rev** **1** ⌘ Current version: **6.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Synchronization of MBMS context status between UE and SGSN
Source:	⌘	Siemens AG
Work item code:	⌘	MBMS
Date:	⌘	15.02.2005
Category:	⌘	**B**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	SA2 have agreed that there should be a synchronization mechanism between UE and SGSN in order to detect misalignments in the MBMS context status (see S2-043805).
Summary of change:	⌘	1) The MBMS context status is exchanged between UE and SGSN during the routing area updating procedure and the service request procedure. If MBMS contexts are indicated to be in MBMS-SM state PDP-INACTIVE in the UE, but not in the network, they shall be deactivated locally in the network (and vice versa). 2) Additionally, a missing description of the handling of the PDP context status IE in the SERVICE REQUEST message is added in subclause 4.7.13.1.
Consequences if not approved:	⌘	Stage 2 requirement not fulfilled. – Without this CR, there is no mechanism which allows to detect misalignments in the MBMS context status in a systematic way.

Clauses affected:	⌘	4.7.5.1.3, 4.7.13.1, 4.7.13.3, 9.4.14, 9.4.14.9 (new), 9.4.15, 9.4.15.13 (new), 9.4.20, 9.4.20.2 (new), 9.4.21, 9.4.21.2 (new), 10.5.7.6 (new)

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	Approval of CR 24.008-954 rev1 (N1-050308) is a precondition for the approval

	of this CR.

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4.7.5.1.3 Normal and periodic routing area updating procedure accepted by the network

If the routing area updating request has been accepted by the network, a ROUTING AREA UPDATE ACCEPT message shall be sent to the MS. The network may assign a new P-TMSI and/or a new P-TMSI signature for the MS. If a new P-TMSI and/or P-TMSI signature have been assigned to the MS, it/they shall be included in the ROUTING AREA UPDATE ACCEPT message together with the routing area identification.In a shared network the network shall indicate the PLMN identity of the CN operator that has accepted the routing area updating request in the RAI contained in the ROUTING AREA UPDATE ACCEPT message (see 3GPP TS 23.251 [109]).

If a new DRX parameter was included in the ROUTING AREA UPDATE REQUEST message, the network shall store the new DRX parameter and use it for the downlink transfer of signalling and user data.

In A/Gb mode the Cell Notification information element shall be included in the ROUTING AREA UPDATE ACCEPT message in order to indicate the ability of the network to support the Cell Notification.

The network shall change to state GMM-COMMON-PROCEDURE-INITIATED and shall start the supervision timer T3350 as described in subclause 4.7.6.

If the LAI or PLMN identity contained in the ROUTING AREA UPDATE ACCEPT message is a member of any of the "forbidden" lists then any such entry shall be deleted.

In Iu mode, the network should prolong the PS signalling connection if the mobile station has indicated a follow-on request pending in ROUTING AREA UPDATE REQUEST. The network may also prolong the PS signalling connection without any indication from the mobile terminal.

If the PDP context status information element is included in the ROUTING AREA UPDATE REQUEST message, then the network shall deactivate all those PDP contexts locally (without peer to peer signalling between the MS and the network), which are not in SM state PDP-INACTIVE on network side but are indicated by the MS as being in state PDP-INACTIVE.

If the MBMS context status information element is included in the ROUTING AREA UPDATE REQUEST message, then the network shall deactivate all those MBMS contexts locally (without peer to peer signalling between the MS and network) which are not in SM state PDP-INACTIVE on the network side, but are indicated by the MS as being in state PDP-INACTIVE. If no MBMS context status information element is included, then the network shall deactivate all MBMS contexts locally which are not in SM state PDP-INACTIVE on the network side.

Upon receipt of a ROUTING AREA UPDATE ACCEPT message, the MS stores the received routing area identification, stops timer T3330, shall reset the routing area updating attempt counter and sets the GPRS update status to GU1 UPDATED. If the message contains a P-TMSI, the MS shall use this P-TMSI as new temporary identity for GPRS services and shall store the new P-TMSI. If no P-TMSI was included by the network in the ROUTING AREA UPDATING ACCEPT message, the old P-TMSI shall be kept. Furthermore, the MS shall store the P-TMSI signature if received in the ROUTING AREA UPDATING ACCEPT message. If no P-TMSI signature was included in the message, the old P-TMSI signature, if available, shall be deleted.

If the ROUTING AREA UPDATE REQUEST message was used to update the network with a new DRX parameter IE, the MS shall start using the new DRX parameter upon receipt of the ROUTING AREA UPDATE ACCEPT message.

If the PDP context status information element is included in ROUTING AREA UPDATE ACCEPT message, then the MS shall deactivate all those PDP contexts locally (without peer to peer signalling between the MS and network), which are not in SM state PDP-INACTIVE in the MS but are indicated by the network as being in state PDP-INACTIVE.

If the MBMS context status information element is included in the ROUTING AREA UPDATE ACCEPT message, then the MS shall deactivate all those MBMS contexts locally (without peer to peer signalling between the MS and network) which are not in SM state PDP-INACTIVE in the MS, but are indicated by the network as being in state PDP-INACTIVE. If no MBMS context status information element is included, then the MS shall deactivate all those MBMS contexts locally which are not in SM state PDP-INACTIVE in the MS.

In A/Gb mode, if the ROUTING AREA UPDATE ACCEPT message contains the Cell Notification information element, then the MS shall start to use the LLC NULL frame to perform cell updates.

The network may also send a list of "equivalent PLMNs" in the ROUTING AREA UPDATE ACCEPT message. Each entry of the list contains a PLMN code (MCC+MNC). The mobile station shall store the list, as provided by the network, except that any PLMN code that is already in the "forbidden PLMN" list shall be removed from the "equivalent PLMNs" list before it is stored by the mobile station. In addition the mobile station shall add to the stored

list the PLMN code of the registered PLMN that sent the list. All PLMNs in the stored list shall be regarded as equivalent to each other for PLMN selection, cell selection/re-selection and handover. The stored list in the mobile station shall be replaced on each occurrence of the ROUTING AREA UPDATE ACCEPT message. If no list is contained in the message, then the stored list in the mobile station shall be deleted. The list shall be stored in the mobile station while switched off so that it can be used for PLMN selection after switch on.

A ROUTING AREA UPDATE COMPLETE message shall be returned to the network if the ROUTING AREA UPDATE ACCEPT message contained:

- a P-TMSI; and/or
- Receive N-PDU Numbers (see 3GPP TS 44.065 [78] and 3GPP TS 25.322).

In the latter case the Receive N-PDU Numbers values valid in the MS, shall be included in the ROUTING AREA UPDATE COMPLETE message.

NOTE 1: In Iu mode, after a routing area updating procedure, the mobile station can initiate Service Request procedure to request the resource reservation for the active PDP contexts if the resources have been released by the network or send upper layer message (e.g. ACTIVATE PDP CONTEXT REQUEST) to the network via the existing PS signaling connection.

In Iu mode, if the network wishes to prolong the PS signalling connection (for example, if the mobile station has indicated "follow-on request pending" in ROUTING AREA UPDATE REQUEST message) the network shall indicate the "follow-on proceed" in the ROUTING AREA UPDATE ACCEPT message. If the network wishes to release the PS signalling connection, the network shall indicate "no follow-on proceed" in the ROUTING AREA UPDATE ACCEPT message.

After that in Iu mode, the mobile station shall act according to the follow-on proceed flag included in the Update result information element in the ROUTING AREA UPDATE ACCEPT message (see subclause 4.7.13).

The network may also send a list of local emergency numbers in the ROUTING AREA UPDATE ACCEPT, by including the Emergency Number List IE. The mobile equipment shall store the list, as provided by the network, except that any emergency number that is already stored in the SIM/USIM shall be removed from the list before it is stored by the mobile equipment. If there are no emergency numbers stored on the SIM/USIM, then before storing the received list the mobile equipment shall remove from it any emergency number stored permanently in the ME for use in this case (see 3GPP TS 22.101 [8]). The list stored in the mobile equipment shall be replaced on each receipt of a new Emergency Number List IE.

The emergency number(s) received in the Emergency Number List IE are valid only in networks with the same MCC as in the cell on which this IE is received. If no list is contained in the ROUTING AREA UPDATE ACCEPT message, then the stored list in the mobile equipment shall be kept, except if the mobile equipment has successfully registered to a PLMN with an MCC different from that of the last registered PLMN.

The mobile equipment shall use the stored list of emergency numbers received from the network in addition to the emergency numbers stored on the SIM/USIM or ME to detect that the number dialled is an emergency number.

NOTE 2: The mobile equipment may use the emergency numbers list to assist the end user in determining whether the dialled number is intended for an emergency service or for another destination, e.g. a local directory service. The possible interactions with the end user are implementation specific.

The list of emergency numbers shall be deleted at switch off and removal of the SIM/USIM. The mobile equipment shall be able to store up to ten local emergency numbers received from the network.

********** NEXT MODIFIED SECTION **********

4.7.13.1 Service Request procedure initiation

The MS initiates the Service request procedure by sending a SERVICE REQUEST message. The timer T3317 shall be started after the SERVICE REQUEST message has been sent and state GMM-SERVICE-REQUEST-INITIATED is entered. The message SERVICE REQUEST shall contain the P-TMSI and the Service type shall indicate either "data", "signalling", "paging response" or "MBMS notification response".

If the PDP context status information element is included in the SERVICE REQUEST message, then the network shall deactivate all those PDP contexts locally (without peer to peer signalling between the MS and the network) which are not in SM state PDP-INACTIVE on the network side, but are indicated by the MS as being in state PDP-INACTIVE.

If the MBMS context status information element is included in the SERVICE REQUEST message, then the network shall deactivate all those MBMS contexts locally (without peer to peer signalling between the MS and network) which are not in SM state PDP-INACTIVE on the network side, but are indicated by the MS as being in state PDP-INACTIVE. If no MBMS context status information element is included, then the network shall deactivate all MBMS contexts locally which are not in SM state PDP-INACTIVE on the network side.

4.7.13.2 GMM common procedure initiation

The network may initiate GMM common procedures, e.g. the GMM identification or the GMM authentication and ciphering procedure, depending on the received information such as GPRS ciphering key sequence number and P-TMSI.

4.7.13.3 Service request procedure accepted by the network

If the SERVICE REQUEST message was sent in PMM-IDLE mode, the indication from the lower layers that the security mode control procedure is completed shall be treated as a successful completion of the procedure. The timer T3317 shall be stopped, and the MS enters GMM-REGISTERED state and PMM-CONNECTED mode.

If the SERVICE REQUEST message was sent in PMM-CONNECTED mode, then the reception of the SERVICE ACCEPT message shall be treated as a successful completion of the procedure. The timer T3317 shall be stopped and the MS remains in PMM-CONNECTED mode.

If the PDP context status information element is included in the Service Accept, then the MS shall deactivate locally (without peer to peer signalling between the MS and the network) all that PDP contexts which are not in SM state PDP-INACTIVE on MS side but are indicated by the Network as being in state PDP-INACTIVE.

If the MBMS context status information element is included in the SERVICE ACCEPT message, then the MS shall deactivate all those MBMS contexts locally (without peer to peer signalling between the MS and network) which are not in SM state PDP-INACTIVE in the MS, but are indicated by the network as being in state PDP-INACTIVE. If no MBMS context status information element is included, then the MS shall deactivate all those MBMS contexts locally which are not in SM state PDP-INACTIVE in the MS.

********** NEXT MODIFIED SECTION **********

9.4.14 Routing area update request

This message is sent by the MS to the network either to request an update of its location file or to request an IMSI attach for non-GPRS services. See table 9.4.14/3GPP TS 24.008.

Message type: ROUTING AREA UPDATE REQUEST

Significance: dual

Direction: MS to network

Table 9.4.14/3GPP TS 24.008: ROUTING AREA UPDATE REQUEST message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip indicator	Skip indicator 10.3.1	M	V	1/2
	Routing area update request message identity	Message type 10.4	M	V	1
	Update type	Update type 10.5.5.18	M	V	1/2
	GPRS ciphering key sequence number	Ciphering key sequence number 10.5.1.2	M	V	1/2
	Old routing area identification	Routing area identification 10.5.5.15	M	V	6
	MS Radio Access capability	MS Radio Access capability 10.5.5.12a	M	LV	6 - 52
19	Old P-TMSI signature	P-TMSI signature 10.5.5.8	O	TV	4
17	Requested READY timer value	GPRS Timer 10.5.7.3	O	TV	2
27	DRX parameter	DRX parameter 10.5.5.6	O	TV	3
9-	TMSI status	TMSI status 10.5.5.4	O	TV	1
18	P-TMSI	Mobile identity 10.5.1.4	O	TLV	7
31	MS network capability	MS network capability 10.5.5.12	O	TLV	4-10
32	PDP context status	PDP context status 10.5.7.1	O	TLV	4
33	PS LCS Capability	PS LCS Capability 10.5.5.22	**O**	**TLV**	**3**
35	MBMS context status	MBMS context status 10.5.7.6	O	TLV	2 - 18

9.4.14.1 Old P-TMSI signature

This IE is included by the MS if it was received from the network in an ATTACH ACCEPT or ROUTING AREA UPDATE ACCEPT message.

9.4.14.2 Requested READY timer value

This IE may be included if the MS wants to indicate a preferred value for the READY timer.

9.4.14.3 DRX parameter

This IE shall be included if the MS changes the access network from GSM to UMTS, or the MS wants to indicate new DRX parameters to the network.

9.4.14.4 TMSI status

This IE shall be included if the MS performs a combined routing area update and no valid TMSI is available.

9.4.14.5 P-TMSI (UMTS only)

This IE shall be included by the MS.

9.4.14.6 MS network capability

This IE shall be included by the MS to indicate it’s capabilities to the network.

9.4.14.7 PDP context status

This IE shall be included by the MS.

9.4.14.8 PS LCS Capability

This IE shall be included if the MS supports at least one positioning method for the provision of location services (LCS) via the PS domain in Gb-mode.

9.4.14.9 MBMS context status

This IE shall be included by the MS, if it has MBMS contexts with an SM state different from PDP-INACTIVE.

9.4.15 Routing area update accept

This message is sent by the network to the MS to provide the MS with GPRS mobility management related data in response to a *routing area update request* message. See table 9.4.15/3GPP TS 24.008.

Message type: ROUTING AREA UPDATE ACCEPT

Significance: dual

Direction: network to MS

Table 9.4.15/3GPP TS 24.008: ROUTING AREA UPDATE ACCEPT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip indicator	Skip indicator 10.3.1	M	V	1/2
	Routing area update accept message identity	Message type 10.4	M	V	1
	Force to standby	Force to standby 10.5.5.7	M	V	1/2
	Update result	Update result 10.5.5.17	M	V	1/2
	Periodic RA update timer	GPRS Timer 10.5.7.3	M	V	1
	Routing area identification	Routing area identification 10.5.5.15	M	V	6
19	P-TMSI signature	P-TMSI signature 10.5.5.8	O	TV	4
18	Allocated P-TMSI	Mobile identity 10.5.1.4	O	TLV	7
23	MS identity	Mobile identity 10.5.1.4	O	TLV	7-10
26	List of Receive N-PDU Numbers	Receive N-PDU Number list 10.5.5.11	O	TLV	4 - 19
17	Negotiated READY timer value	GPRS Timer 10.5.7.3	O	TV	2
25	GMM cause	GMM cause 10.5.5.14	O	TV	2
2A	T3302 value	GPRS Timer 2 10.5.7.4	O	TLV	3
8C	Cell Notification	Cell Notification 10.5.5.21	O	T	1
4A	Equivalent PLMNs	PLMN List 10.5.1.13	O	TLV	5-47
32	PDP context status	PDP context status 10.5.7.1	O	TLV	4
B-	Network feature support	Network feature support 10.5.5.23	O	TV	1
34	Emergency Number List	Emergency Number List 10.5.3.13	O	TLV	5-50
35	MBMS context status	MBMS context status 10.5.7.6	O	TLV	2 - 18

9.4.15.1 P-TMSI signature

This IE may be included to assign an identity to the MS's GMM context.

9.4.15.2 Allocated P-TMSI

This IE may be included to assign a P-TMSI to an MS in case of a GPRS or combined routing area updating procedure.

9.4.15.3 MS identity

This IE may be included to assign or unassign a TMSI to a MS in case of a combined routing area updating procedure.

9.4.15.4 List of Receive N-PDU Numbers

This IE shall be included in case of an inter SGSN routing area updating from A/Gb mode to A/Gb mode, or inter SGSN routing area updating from Iu mode to A/Gb mode, or intra SGSN routing area updating from Iu mode to A/Gb mode, if there are PDP contexts that have been activated in LLC acknowledged transfer mode.

9.4.15.5 Negotiated READY timer value

This IE may be included to indicate a value for the READY timer.

9.4.15.6 GMM cause

This IE shall be included if the combined GPRS routing area updating procedure was successful for GPRS services only.

9.4.15.7 T3302 value

This IE may be included to indicate a value for the T3302 timer.

9.4.15.8 Cell Notification (A/Gb mode only)

In GSM, this IE shall be included if by the SGSN in order to indicate the ability to support the Cell Notification.

9.4.15.9 Equivalent PLMNs

The *Equivalent PLMNs* information element is included if the network wants to inform the mobile station of equivalent PLMNs.

9.4.15.10 PDP context status

This IE shall be included by the NW.

9.4.15.11 Network feature support

This IE may be included to inform the MS of the support of certain features. If this IE is not included then the respective features are not supported.

9.4.15.12 Emergency Number List

This IE may be sent by the network. If this IE is sent, the contents of this IE indicates a list of emergency numbers valid within the same MCC as in the cell on which this IE is received.

9.4.15.13 MBMS context status

This IE shall be included by the network, if it has MBMS contexts for the MS with an SM state different from PDP-INACTIVE.

********** NEXT MODIFIED SECTION **********

9.4.20 Service Request (UMTS only)

This message is sent by the MS to transfer to establish logical association between the MS and the network. See table 9.4.20/3GPP TS 24.008.

Message type: Service Request

Significance: dual

Direction: MS to network

Table 9.4.20/3GPP TS 24.008: Contents of Service Request message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip indicator	Skip indicator 10.3.1	M	V	1/2
	Service Request	Message type 10.4	M	V	1
	Ciphering key sequence number	Ciphering key sequence number 10.5.1.2	M	V	1/2
	Service type	Service type 10.5.5.20	M	V	1/2
	P-TMSI	Mobile station identity 10.5.1.4	M	LV	6
32	PDP context status	PDP context status 10.5.7.1	O	TLV	4
35	MBMS context status	MBMS context status 10.5.7.6	O	TLV	2 - 18

9.4.20.1 PDP context status

This IE shall be included by the MS.

9.4.20.2 MBMS context status

This IE shall be included by the MS, if it has MBMS contexts with an SM state different from PDP-INACTIVE.

9.4.21 Service Accept (UMTS only)

This message is sent by the network in response to a *Service Request* message. See table 9.4.21/3GPP TS 24.008.

Message type: Service Accept

Significance: dual

Direction: network to MS

Table 9.4.21/3GPP TS 24.008: Contents of Service Accept message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip indicator	Skip indicator 10.3.1	M	V	1/2
	Service Accept	Message type 10.4	M	V	1
32	PDP context status	PDP context status 10.5.7.1	O	TLV	4
35	MBMS context status	MBMS context status 10.5.7.6	O	TLV	2 - 18

9.4.21.1 PDP context status

This IE shall be included by the NW.

9.4.21.2 MBMS context status

This IE shall be included by the network, if it has MBMS contexts for the MS with an SM state different from PDP-INACTIVE.

********** NEXT SECTION FOR INFORMATION ONLY **********

10.5.7.1 PDP context status

The purpose of the *PDP context status* information element is to indicate the state of each PDP context which can be identified by NSAPI.

The *PDP context status* information element is a type 4 information element with 4 octets length.

The *PDP context status* information element is coded as shown in figure 10.5.148/3GPP TS 24.008 and table 10.5.164/3GPP TS 24.008.

8	7	6	5	4	3	2	1	
PDP context status IEI								octet 1
Length of PDP context status contents								Octet 2
NSAPI (7)	NSAPI (6)	NSAPI (5)	NSAPI (4)	NSAPI (3)	NSAPI (2)	NSAPI (1)	NSAPI (0)	octet 3
NSAPI (15)	NSAPI (14)	NSAPI (13)	NSAPI (12)	NSAPI (11)	NSAPI (10)	NSAPI (9)	NSAPI (8)	octet 4

Figure 10.5.148/3GPP TS 24.008 *PDP context status* information element

Table 10.5.164/3GPP TS 24.008: *PDP context status* information element

NSAPI(x) shall be coded as follows:

NSAPI(0) - NSAPI(4):
are coded as '0' and shall be treated as spare in this version of the protocol.
NSAPI(5) – NSAPI(15):
0 indicates that the SM state of the corresponding PDP context is PDP-INACTIVE.
1 indicates that the SM state of the corresponding PDP context is not PDP-INACTIVE.

********** NEXT MODIFIED SECTION **********

10.5.7.6 MBMS context status

The purpose of the *MBMS context status* information element is to indicate the state of each MBMS context which can be identified by an NSAPI.

The *MBMS context status* information element is a type 4 information element with a minimum length of 2 octets and a maximum length of 18 octets.

The *MBMS context status* information element is coded as shown in figure 10.5.149/3GPP TS 24.008 and table 10.5.165/3GPP TS 24.008.

8	7	6	5	4	3	2	1	
MBMS context status IEI								octet 1
Length of MBMS context status contents								octet 2
NSAPI (135)	NSAPI (134)	NSAPI (133)	NSAPI (132)	NSAPI (131)	NSAPI (130)	NSAPI (129)	NSAPI (128)	octet 3
NSAPI (143)	NSAPI (142)	NSAPI (141)	NSAPI (140)	NSAPI (139)	NSAPI (138)	NSAPI (137)	NSAPI (136)	octet 4
NSAPI (255)	NSAPI (254	NSAPI (253)	NSAPI (252)	NSAPI (251)	NSAPI (250)	NSAPI (249)	NSAPI (248)	octet 18

Figure 10.5.149/3GPP TS 24.008 *MBMS context status* information element

Table 10.5.165/3GPP TS 24.008: *MBMS context status* information element

For x = 128 to 255, NSAPI(x) shall be coded as follows:

0 indicates that the SM state of the corresponding MBMS context is PDP-INACTIVE.
1 indicates that the SM state of the corresponding MBMS context is not PDP-INACTIVE.

If octets are not included in the information element, the receiver shall interprete the NSAPI(x) values of these octets as set to 0.

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CHANGE REQUEST

⌘ **24.008** **CR** **954** ⌘ **rev** **1** ⌘ Current version: **6.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	MBMS Session Management clarifications
Source:	⌘	Siemens, Infineon Technologies
Work item code:	⌘	MBMS
Date:	⌘	15/02/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
Ph2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*
Rel-7 *(Release 7)*

Reason for change:	⌘	For the MBMS context handling it was decided to use the existing SM protocol, rather than to introduce a new protocol entity. This was done be introducing new MBMS specific SM procedures and corresponding new SM states. If the context is not assigned, the SM state is PDP-INACTIVE. From this state the context could then be activated as a classic P2P PDP context or as MBMS context. In the current version of this specification the MBMS specific extensions of the SM protocol are defined in a separate chapter 6.2 on the same level as the SM protocol itself (6.1). This gives the impression, that the MBMS extensions in the SM are a new protocol entity. The terms "MBMS protocol", "MBMS Session Management" and "MBMS protocol" used in chapter 6.2 are also hint in this direction. This leads first to the risk of misinterpretations especially in such a manner that the MBSM specific part is independent from the SM protocol. With this document structure it is also difficult to check the consistency of the SM protocol whenever changes will be made in the future.
Summary of change:	⌘	It is proposed to move the sub-clauses of chapter 6.2 to the appropriate sub-clauses in chapter 6.1. The state MBMS-INACTIVE is proposed to be deleted, as for an inactive context no distinction between PDP and MBMS could be made. It is proposed to get rid of the terms "MBMS protocol", "MBMS Session Management" and "MBMS protocol" (e.g. in the timer sub-clause 11.2.3). It is proposed to move the description of the new MBMS specific SM cause to I.1 and to delete I.3. State diagrams for the MBMS context handling are introduced.

		Sequence charts for the MBMS procedures are introduced.
Consequences if not approved:	⌘	Inconsistent SM state model, as the state MBMS-INACTIVE collides with PDP-INACTIVE. Risk of misinterpretation, that the MBMS SM is an independent protocol entity rather then a protocol extension of the SM protocol.

Clauses affected:	⌘	1.6.1, 6.1, 6.2, 11.2.3, I.1, I.3			
		Y	**N**		
Other specs affected:	⌘		**X**	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

1.6 Overview of control procedures

1.6.1 List of procedures

The following procedures are specified in the present document:

a) Clause 4 specifies elementary procedures for Mobility Management:

- mobility management common procedures (subclause 4.3):
  - TMSI reallocation procedure (subclause 4.3.1);
  - authentication procedure (subclause 4.3.2);
  - identification procedure (subclause 4.3.3);
  - IMSI detach procedure (subclause 4.3.4);
  - abort procedure (subclause 4.3.5);
  - MM information procedure (subclause 4.3.6).
- mobility management specific procedures (subclause 4.4):
  - location updating procedure (subclause 4.4.1);
  - periodic updating (subclause 4.4.2);
  - IMSI attach procedure (subclause 4.4.3);
  - generic location updating procedure (subclause 4.4).
- connection management sublayer service provision:
  - mobility management connection establishment (subclause 4.5.1);
  - mobility management connection information transfer phase (subclause 4.5.2);
  - mobility management connection release (subclause 4.5.3).
- GPRS specific mobility management procedures (subclause 4.7):
  - GPRS attach procedure (subclause 4.7.3);
  - GPRS detach procedure (subclause 4.7.4);
  - GPRS routing area updating procedure (subclause 4.7.5).
- GPRS common mobility management procedures (subclause 4.7):
  - GPRS P-TMSI reallocation procedure (subclause 4.7.6);
  - GPRS authentication and ciphering procedure (subclause 4.7.7);
  - GPRS identification procedure (subclause 4.7.8);
  - GPRS information procedure (subclause 4.7.12).

b) Clause 5 specifies elementary procedures for circuit switched Call Control comprising the following elementary procedures:

- mobile originating call establishment (subclause 5.2.1);
- mobile terminating call establishment (subclause 5.2.2);
- signalling procedures during the active state (subclause 5.3):

- user notification procedure (subclause 5.3.1);
- call rearrangements (subclause 5.3.2);
- DTMF protocol control procedure (subclause 5.5.7);
- in-call modification (subclause 5.3.4).

- call clearing initiated by the mobile station (subclause 5.4.3);
- call clearing initiated by the network (subclause 5.4.4);
- miscellaneous procedures:
  - in-band tones and announcements (subclause 5.5.1);
  - status enquiry procedure (subclause 5.5.3);
  - call re-establishment procedure (subclause 5.5.4).

d) Clause 6 specifies elementary procedures for session management:

- GPRS session management procedures (subclause 6.1):
  - PDP context activation (subclause 6.1.3.1 and 6.1.3.2);
  - PDP context modification (subclause 6.1.3.3);
  - PDP context deactivation (subclause 6.1.3.4);~~.~~

~~- MBMS session management procedures (subclause 6.2):~~

  - MBMS context activation (sub~~l~~clause 6.1.3.8~~6.2.3.1~~);
  - MBMS context deactivation (subclause 6.1.3.9~~6.2.3.2~~).

The elementary procedures can be combined to form structured procedures. Examples of such structured procedures are given in clause 7. This part of the present document is only provided for guidance to assist implementations.

Clause 8 specifies actions to be taken on various error conditions and also provides rules to ensure compatibility with future enhancements of the protocol.

********** NEXT MODIFIED SECTION **********

6 Support for packet services

This chapter contains the description of the procedures for the session management of GPRS point-to-point data services and MBMS point-to-point and point-to-multipoint data services at the radio interface (Reference point Uu and U_m).

6.1 GPRS Session management

6.1.1 General

The main function of the session management (SM) is to support PDP context handling of the user terminal. Furthermore, the SM supports the MBMS context handling within the MS and the network, which allows the MS to receive data from a specific MBMS source.

The SM comprises procedures for

- identified PDP context activation, deactivation and modification; and
- identified MBMS context activation and deactivation.

SM procedures for identified access can only be performed if a GMM context has been established between the MS and the network. If no GMM context has been established, the MM sublayer has to initiate the establishment of a GMM context by use of the GMM procedures as described in chapter 4. After GMM context establishment, SM uses services offered by GMM (see 3GPP TS 24.007 [20]). Ongoing SM procedures are suspended during GMM procedure execution.

The SM procedures for identified MBMS context activation and deactivation can only be performed, if in addition to the GMM context the MS has a PDP context activated.

In Iu mode only, integrity protected signalling (see subclause 4.1.1.1.1 of the present document and in general, see 3GPP TS 33.102 [5a]) is mandatory. In Iu mode only, all protocols shall use integrity protected signalling. Integrity protection of all SM signalling messages is the responsibility of lower layers. It is the network which activates integrity protection. This is done using the security mode control procedure (3GPP TS 25.331 [23c] and 3GPP TS 44.118 [111]).

For the session management protocol, the extended TI mechanism may be used (see 3GPP TS 24.007 [20]).

6.1.2 Session management states

In this subclause, the SM states are described for one SM entity (see 3GPP TS 24.007 [20]). Each SM entity is associated with one PDP context or MBMS context. Subclause 6.1.2.1 describes the SM states in the MS and subclause 6.1.2.2 describes the SM states on the network side.

6.1.2.1 Session management states in the MS

In this subclause, the possible states of an SM entity in the mobile station are described. As illustrated in figures 6.1/3GPP TS 24.008 and 6.1a/3GPP TS 24.008 there are seven~~five~~ SM states in the MS.

6.1.2.1.1 PDP-INACTIVE

This state indicates that ~~no~~neither PDP context nor MBMS context exist~~s~~.

6.1.2.1.2 PDP-ACTIVE-PENDING

This state exists when PDP context activation was requested by the MS.

6.1.2.1.3 PDP-INACTIVE-PENDING

This state exists when deactivation of the PDP contexts was requested by the MS.

6.1.2.1.4 PDP-ACTIVE

This state indicates that the PDP context is active.

6.1.2.1.5 PDP-MODIFY_PENDING

This state exists when modification of the PDP context was requested by the MS.

6.1.2.1.6 MBMS-ACTIVE-PENDING

This state exists when the MS has requested the network to activate an MBMS context.

6.1.2.1.7 MBMS-ACTIVE

This state indicates that the MBMS context is active.

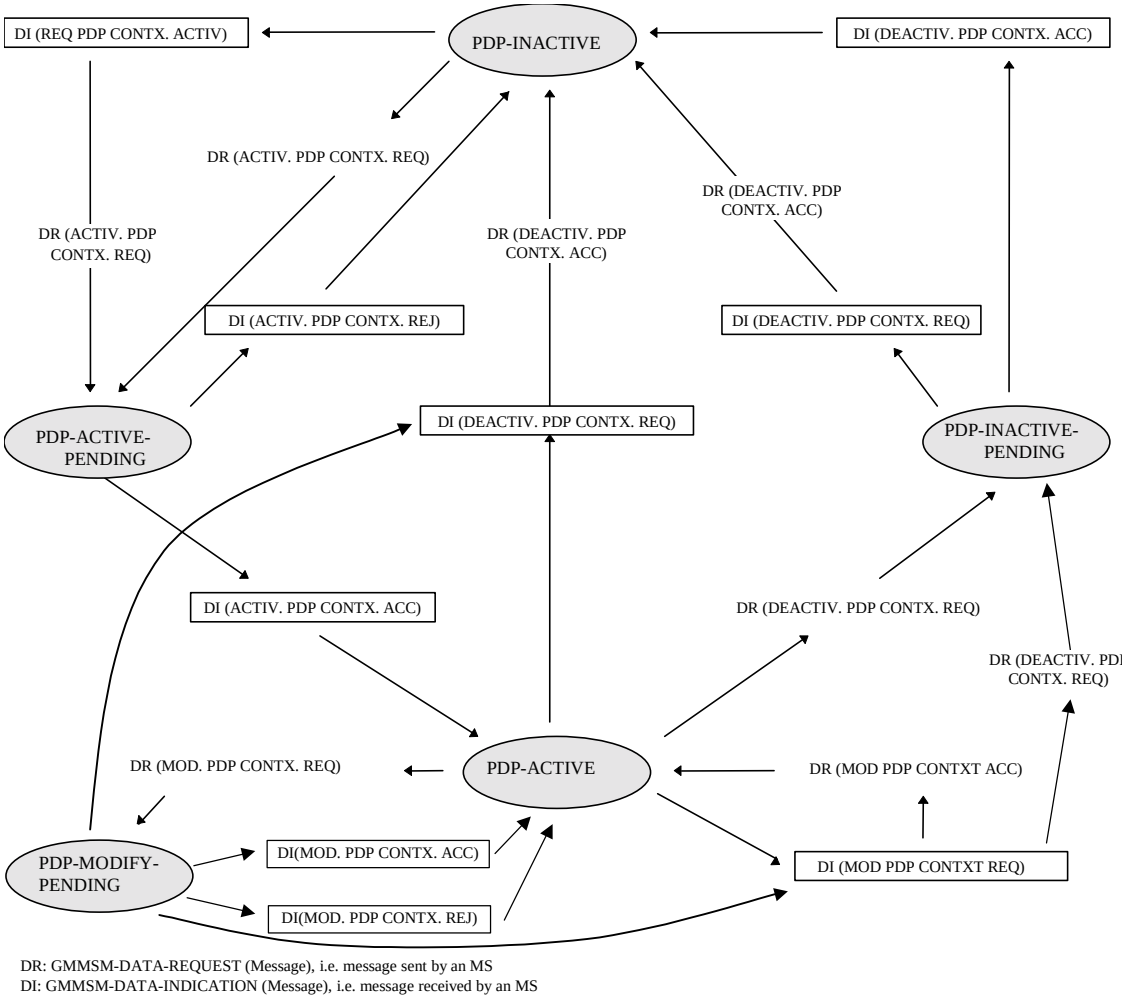


Figure 6.1/3GPP TS 24.008: Session management states for PDP context handling in the MS (overview)

It shall be noted, that Figure 6.1/3GPP TS 24.008 applies to both the PDP context activation procedure and the secondary PDP context activation procedure, though the distinction in messages regarding the activation of PDP contexts is not shown here for simplicity.

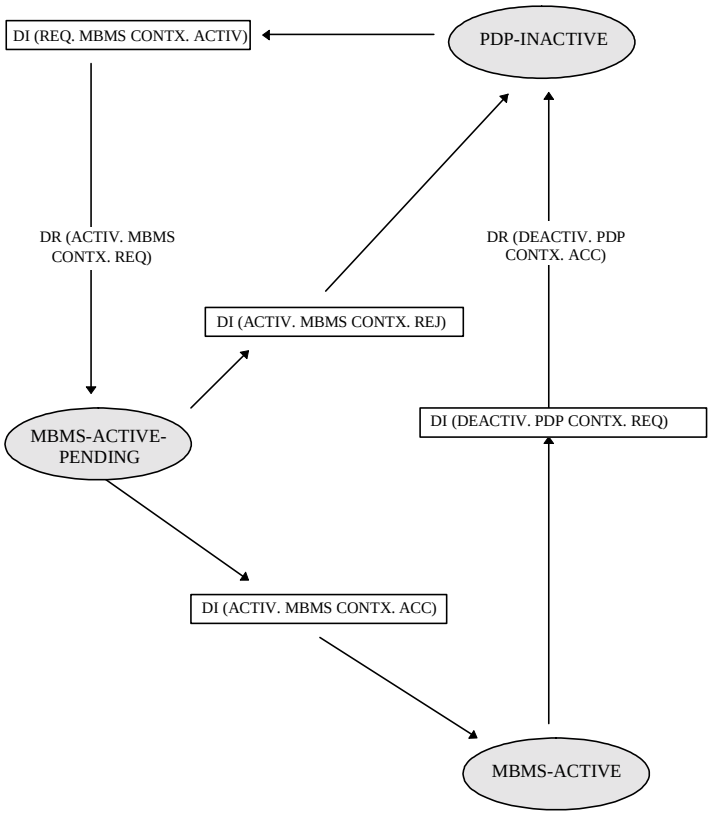


Figure 6.1a/3GPP TS 24.008: Session management states for MBMS context handling in the MS (overview)

6.1.2.2 Session management states on the network side

In this subclause, the possible states of an SM entity on the network side are described. As illustrated in figures 6.2/3GPP TS 24.008 and 6.2a/3GPP TS 24.008 there are eight~~five~~ SM states on the network side.

6.1.2.2.1 PDP-INACTIVE

This state indicates that the PDP context or MBMS context is not active.

6.1.2.2.2 PDP-ACTIVE-PENDING

This state exists when the PDP context activation was initiated by the network.

6.1.2.2.3 PDP-INACTIVE-PENDING

This state exists when deactivation of the PDP context was requested by the network.

6.1.2.2.4 PDP-ACTIVE

This state indicates that the PDP context is active.

6.1.2.2.5 PDP-MODIFY-PENDING

This state exists when modification of the PDP context was requested by the network.

6.1.2.2.6 MBMS-ACTIVE-PENDING

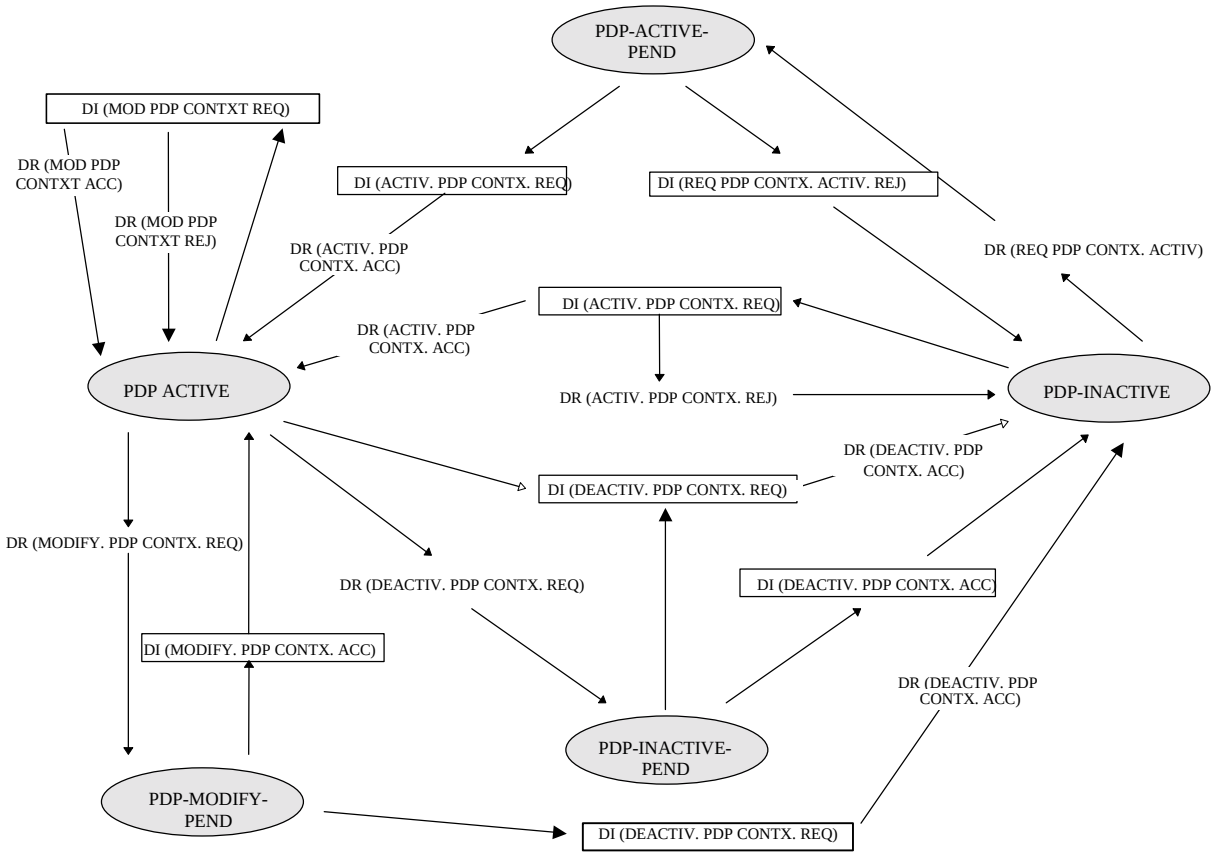
This state exists when the network has initiated MBMS context activation.

6.1.2.2.7 MBMS-INACTIVE-PENDING

This state exists when the network has requested the MS to deactivate an MBMS context.

6.1.2.2.8 MBMS-ACTIVE

This state indicates that the MBMS context is active.



DR: GMMSM-DATA-REQUEST (Message), i.e. message sent by network
DI: GMMSM-DATA-INDICATION (Message), i.e. message received by the network

Figure 6.2/3GPP TS 24.008: Session management states for PDP context handling on the network side (overview)

It shall be noted, that figure 6.2/3GPP TS 24.008 applies to both the PDP context activation procedure and the secondary PDP context activation procedure, though the distinction in messages regarding the activation of PDP contexts is not shown here for simplicity.

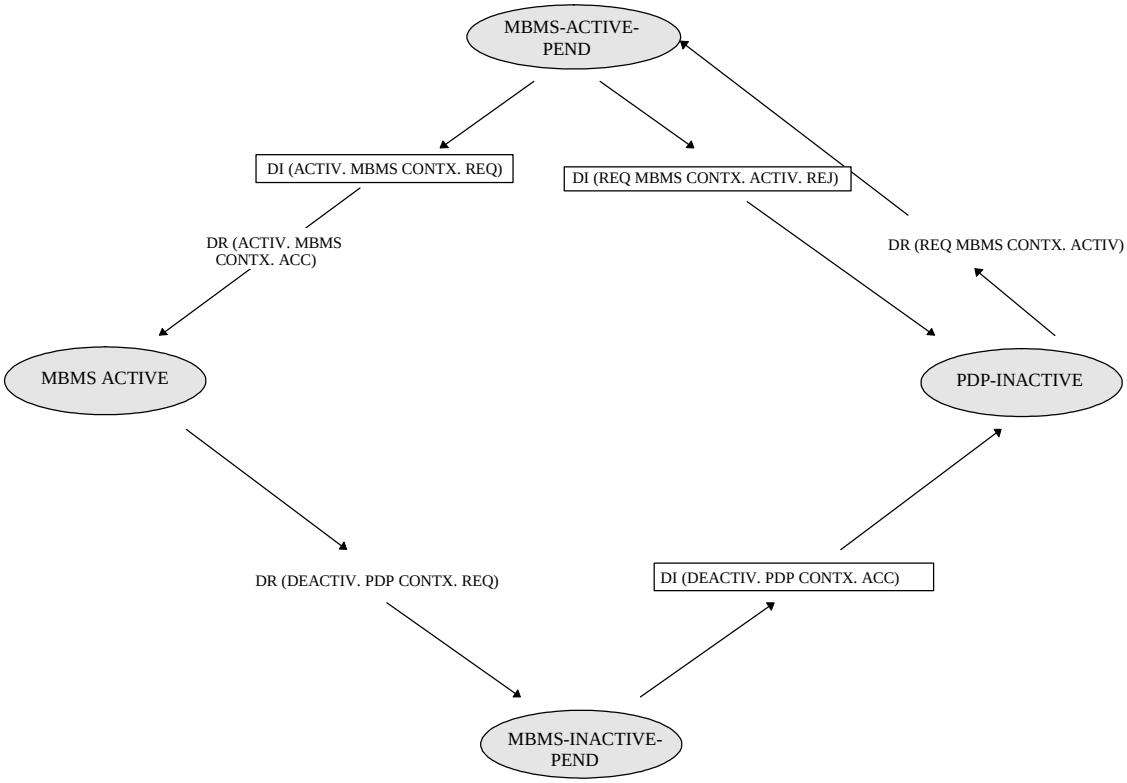


Figure 6.2a/3GPP TS 24.008: Session management states for MBMS context handling on the network side (overview)

6.1.3 Session Management procedures

6.1.3.1 PDP context activation

The purpose of this procedure is to establish a PDP context between the MS and the network for a specific QoS on a specific NSAPI. The PDP context activation may be initiated by the MS or the initiation may be requested by the network.

Each PDP address may be described by one or more PDP contexts in the MS or the network. The PDP Context Activation procedure is used to activate the first PDP context for a given PDP address and APN, whereas all additional contexts associated to the same PDP address and APN are activated with the secondary PDP context activation procedure. When more than one PDP contexts are associated to a PDP address, there shall be a Traffic Flow Template (TFT) for each or all but one context. If present, the TFT shall be sent transparently via the SGSN to the GGSN to enable packet classification and policing for downlink data transfer (see 3GPP TS 23.060 [74]).

6.1.3.1.1 Successful PDP context activation initiated by the mobile station

In order to request a PDP context activation, the MS sends an ACTIVATE PDP CONTEXT REQUEST message to the network, enters the state PDP-ACTIVE-PENDING and starts timer T3380. The message contains the selected NSAPI, PDP type, requested QoS and, if the MS requests a static address, the PDP address. The MS shall ensure that the selected NSAPI is not currently being used by another Session Management entity in the MS.

Upon receipt of an ACTIVATE PDP CONTEXT REQUEST message, the network selects a radio priority level based on the QoS negotiated and may reply with an ACTIVATE PDP CONTEXT ACCEPT message. Upon receipt of the message ACTIVATE PDP CONTEXT ACCEPT the MS shall stop timer T3380, shall enter the state PDP-ACTIVE. If the offered QoS parameters received from the network differ from the QoS requested by the MS, the MS shall either accept the negotiated QoS or initiate the PDP context deactivation procedure.

NOTE 1: If the MS requested a value for a QoS parameter that is not within the range specified by 3GPP TS 23.107, the network should negotiate the parameter to a value that lies within the specified range.

In A/Gb mode, the MS shall initiate establishment of the logical link for the LLC SAPI indicated by the network with the offered QoS and selected radio priority level if no logical link has been already established for that SAPI. If the offered QoS parameters received from the network differ from the QoS requested by the MS, the MS shall either accept the negotiated QoS or initiate the PDP context deactivation procedure. If the LLC SAPI indicated by the network can not be supported by the MS, the MS shall initiate the PDP context deactivation procedure.

In Iu mode, both the network and the MS shall store the LLC SAPI and the radio priority in the PDP context. If a Iu mode to A/Gb mode system change is performed, the new SGSN shall initiate establishment of the logical link using the negotiated QoS profile, the negotiated LLC SAPI, and selected radio priority level stored in the PDP context as in a A/Gb mode to A/Gb mode Routing Area Update.

An MS, which is capable of operating in both A/Gb mode and Iu mode, shall use a valid LLC SAPI, while an MS which is capable of operating only in Iu mode shall indicate the LLC SAPI value as "LLC SAPI not assigned" in order to avoid unnecessary value range checking and any other possible confusion in the network. When the MS uses a valid LLC SAPI, the network shall return a valid LLC SAPI. The network shall return the “LLC SAPI not assigned” value only when the MS uses the “LLC SAPI not assigned” value.

NOTE 2: The radio priority level and the LLC SAPI parameters, though not used in Iu mode, shall be included in the messages, in order to support handover between Iu mode and A/Gb mode networks.

6.1.3.1.2 Successful PDP context activation requested by the network

In order to request a PDP context activation, the network sends a REQUEST PDP CONTEXT ACTIVATION message to the MS and starts timer T3385. The message contains an offered PDP address. If available, the APN shall be included in the REQUEST PDP CONTEXT ACTIVATION message.

Upon receipt of a REQUEST PDP CONTEXT ACTIVATION message, the MS shall than either initiate the PDP context activation procedure as described in the previous subclause or shall reject the activation request by sending a REQUEST PDP CONTEXT ACTIVATION REJECT message as described in subclause 6.1.3.1.4. The value of the reject cause IE of the REQUEST PDP CONTEXT ACTIVATION REJECT message shall indicate the reason for rejection, e.g. "insufficient resources to activate another context".

The ACTIVATE PDP CONTEXT REQUEST message sent by the MS in order to initiate the PDP context activation procedure shall contain the PDP address, PDP Type and APN requested by the network in the REQUEST PDP CONTEXT ACTIVATION message.

Upon receipt of the ACTIVATE PDP CONTEXT REQUEST message, the network shall stop timer T3385.

The same procedures then apply as described for MS initiated PDP context activation.

6.1.3.1.3 Unsuccessful PDP context activation initiated by the MS

Upon receipt of an ACTIVATE PDP CONTEXT REQUEST message the network may reject the MS initiated PDP context activation by sending an ACTIVATE PDP CONTEXT REJECT message to the MS. The message shall contain a cause code that typically indicates one of the following causes:

8: Operator Determined Barring;

26: insufficient resources;

27: missing or unknown APN;

28: unknown PDP address or PDP type;

29: user authentication failed;

30: activation rejected by GGSN;

31: activation rejected, unspecified;

32: service option not supported;

33: requested service option not subscribed;

34: service option temporarily out of order;

35: NSAPI already used. The network shall not send this cause code (see note 1); or

95 - 111: protocol errors.

#112: APN restriction value incompatible with active PDP context.

NOTE 1: Pre-R99 network may send this cause code.

Upon receipt of an ACTIVATE PDP CONTEXT REJECT message, the MS shall stop timer T3380 and enter/remain in state PDP-INACTIVE.

6.1.3.1.4 Unsuccessful PDP context activation requested by the network

Upon receipt of the REQUEST PDP CONTEXT ACTIVATION message, the MS may reject the network requested PDP context activation by sending the REQUEST PDP CONTEXT ACTIVATION REJECT message to the network. The message contains the same TI as included in the REQUEST PDP CONTEXT ACTIVATION and an additional cause code that typically indicates one of the following causes:

26: insufficient resources;

31: activation rejected, unspecified;

40: feature not supported; or

95 - 111: protocol errors.

The network shall stop timer T3385 and enter state PDP-INACTIVE.

6.1.3.1.5 Abnormal cases

The following abnormal cases can be identified:

a) Expiry of timers

In the mobile station:

On the first expiry of the timer T3380, the MS shall resend the ACTIVATE PDP CONTEXT REQUEST and shall reset and restart timer T3380. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3380, the MS shall release all resources possibly allocated for this invocation and shall abort the procedure; no automatic PDP context activation re-attempt shall be performed.

On the network side:

On the first expiry of the timer T3385, the network shall resend the message REQUEST PDP CONTEXT ACTIVATION and shall reset and restart timer T3385. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3385, the network shall release possibly allocated resources for this activation and shall abort the procedure.

b) Collision of MS initiated and network requested PDP context activation

Dynamic PDP address collision case:

If the MS uses dynamic PDP addressing that turns out to collide with the network requested PDP address, then there is no detection of collision specified but left for network implementation.

Static PDP address collision detected within the mobile station:

A collision of an MS initiated and a network requested PDP context activation procedure is identified by the MS if a REQUEST PDP CONTEXT ACTIVATION message is received from the network after the MS has sent an ACTIVATE PDP CONTEXT REQUEST message, and the MS has not yet received an ACTIVATE PDP CONTEXT ACCEPT or ACTIVATE PDP CONTEXT REJECT message.

NOTE: In general, the MS is unable to test if the PDP type, PDP address and APN in the REQUEST PDP CONTEXT ACTIVATION message are the same as those for the PDN to which it is attempting to activate a context. This is because the MS may have omitted one or more of the parameters in the ACTIVATE PDP CONTEXT REQUEST message, since it is relying on default values to be provided by the network.

- In the case of such a collision, the MS initiated PDP context activation shall take precedence over the network requested PDP context activation. If the MS is able to compare the PDP type, PDP address and APN requested in the ACTIVATE PDP CONTEXT REQUEST message with those requested in the REQUEST PDP CONTEXT ACTIVATION message and these parameters are equal, then the MS shall discard the REQUEST PDP CONTEXT ACTIVATION message and shall wait for the network response to its ACTIVATE PDP CONTEXT REQUEST message. If the MS is not able to compare the PDP type, PDP address, and APN requested in the ACTIVATE PDP CONTEXT REQUEST message with those requested in the REQUEST PDP CONTEXT ACTIVATION message, then the MS shall send a REQUEST PDP CONTEXT ACTIVATION REJECT message with the cause 'insufficient resources' to the network, and wait for an ACTIVATE PDP CONTEXT ACCEPT message.

Static PDP address collision detected on the network side:

A collision is detected by the network in the case where the PDP address, PDP type and APN derived (according to 23.060 annex A) from the ACTIVATE PDP CONTEXT REQUEST message received from the MS match those in the REQUEST PDP CONTEXT ACTIVATION message sent to the MS.

- In the case of such a collision, the MS initiated PDP context activation shall take precedence over the network requested PDP context activation. The network shall terminate the network requested PDP context activation procedure, and proceed with the MS initiated PDP context activation procedure.

c) MS initiated PDP context activation request for an already activated PDP context (on the network side)

i) If the network receives a ACTIVATE PDP CONTEXT REQUEST message with the same combination of APN, PDP type and PDP address as an already activated PDP context, the network shall deactivate the existing PDP context and, if any, all the linked PDP contexts (matching the combination of APN, PDP type and PDP address), locally without notification to the MS and proceed with the requested PDP context activation.

ii) Alternatively (different combination of APN, PDP type and PDP address), if the NSAPI matches that of an already activated PDP context, then the network shall deactivate only the existing PDP context locally without notification to the MS and proceed with the requested PDP context activation.

It is an implementation option if the parameters used for comparison described in clause i) and ii) are the parameters provided in the (current and previous) ACTIVATE PDP CONTEXT REQUESTs or the parameters which are the result of the application of the selection rules defined in TS23.060 Annex A.2.

The parameter provided in the current ACTIVATE PDP CONTEXT REQUEST can not be compared to the actually used parameters (result of application of selection rules defined in TS23.060 Annex A.2) of the previously activated PDP contexts.

d) Network initiated PDP context activation request for an already activated PDP context (on the mobile station side)

If the MS receives a REQUEST PDP CONTEXT ACTIVATION message with the same combination of APN, PDP type and PDP address as an already activated PDP context, the MS shall deactivate the existing PDP context and, if any, all the linked PDP contexts (matching the combination of APN, PDP type and PDP address) locally without notification to the network and proceed with the requested PDP context activation.

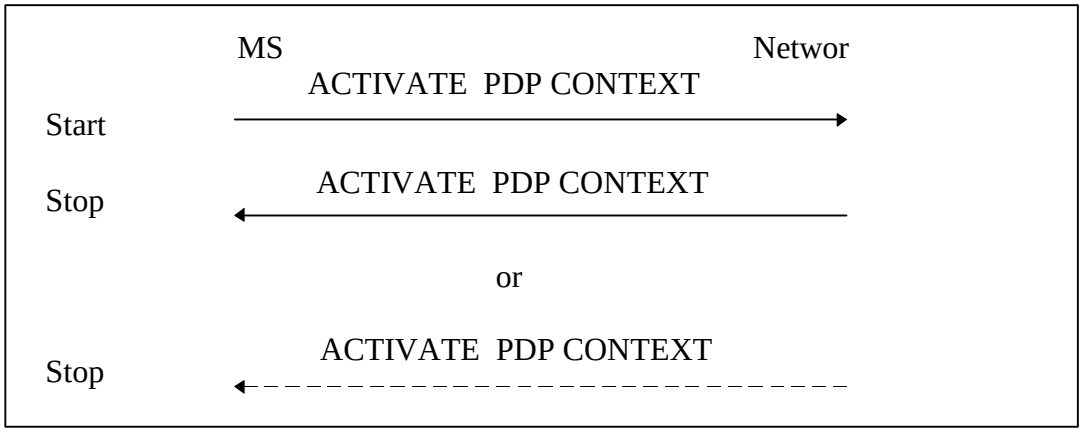


Figure 6.3/3GPP TS 24.008: MS initiated PDP context activation procedure

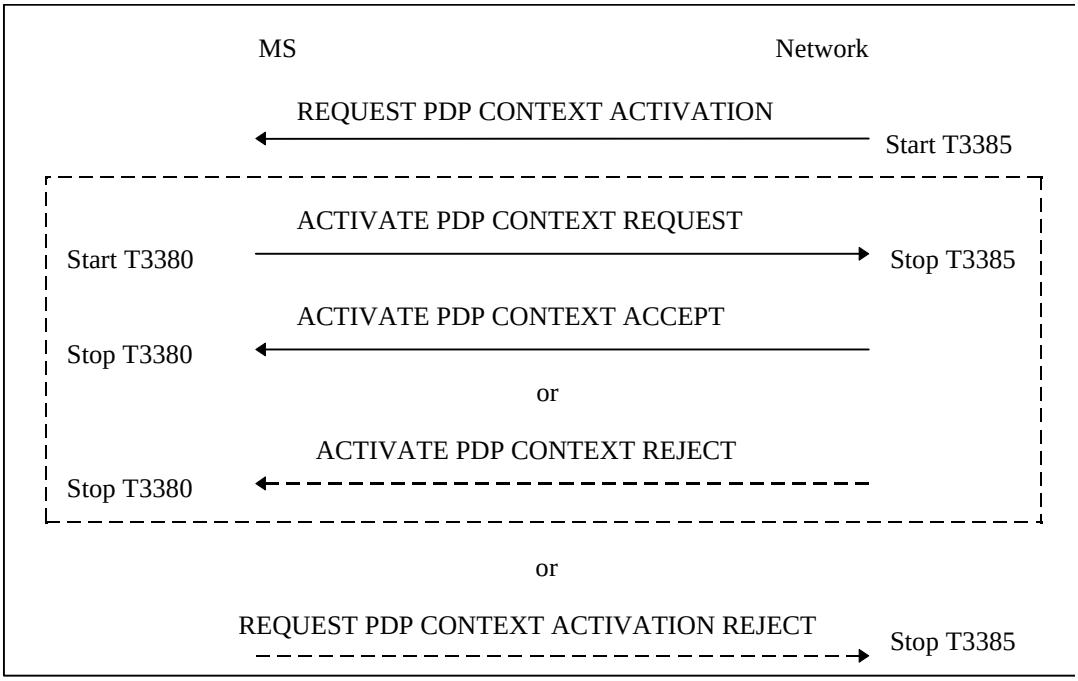


Figure 6.4/3GPP TS 24.008: Network initiated PDP context activation procedure

6.1.3.2 Secondary PDP Context Activation Procedure

The purpose of this procedure is to establish an additional PDP context between the MS and the network for a specific Traffic Flow Template (TFT) and QoS profile on a specific NSAPI, when one or more PDP contexts has/have already been established for the particular PDP address. The MS shall include a request for a TFT if a PDP context without a TFT is presently active, for the particular PDP address.

6.1.3.2.1 Successful Secondary PDP Context Activation Procedure Initiated by the MS

In order to request a PDP context activation with the same PDP address and APN as an already active PDP context, the MS shall send an ACTIVATE SECONDARY PDP CONTEXT REQUEST message to the network, enter the state PDP-ACTIVE-PENDING and start timer T3380. The message shall contain the selected NSAPI. The MS shall ensure that the selected NSAPI is not currently being used by another Session Management entity in the MS. The message shall also include a QoS profile, a requested LLC SAPI and the Linked TI. The QoS profile is the requested QoS. If present, the TFT shall be sent transparently through the SGSN to the GGSN to enable packet classification and policing for downlink data transfer.

Upon receipt of an ACTIVATE SECONDARY PDP CONTEXT REQUEST, the network shall validate the message by verifying the TI given in the Linked TI IE to be any of the active PDP context(s). The same GGSN address shall be used by the SGSN as for the already established PDP context(s) for that PDP address. The network shall select a radio priority level based on the QoS negotiated and shall reply with an ACTIVATE SECONDARY PDP CONTEXT ACCEPT message, if the request can be accepted.

NOTE 1: If the MS requested a value for a QoS parameter that is not within the range specified by 3GPP TS 23.107, the network should negotiate the parameter to a value that lies within the specified range.

Upon receipt of the message ACTIVATE SECONDARY PDP CONTEXT ACCEPT, the MS shall stop timer T3380 and enter the state PDP-ACTIVE. If the offered QoS parameters received from the network differ from the QoS requested by the MS, the MS shall either accept the negotiated QoS or initiate the PDP context deactivation procedure.

In A/Gb mode the MS shall initiate establishment of the logical link for the LLC SAPI indicated by the network with the offered QoS and selected radio priority level if no logical link has been already established for that SAPI. If the LLC SAPI indicated by the network can not be supported by the MS, the MS shall initiate the PDP context deactivation procedure.

In Iu mode, both SGSN and MS shall store the LLC SAPI and the radio priority in the PDP context. If an Iu mode to A/Gb mode Routing Area Update is performed, the new SGSN shall initiate establishment of the logical link using the negotiated LLC SAPI, the negotiated QoS profile and selected radio priority level stored in the PDP context as in an A/Gb mode to A/Gb mode Routing Area Update.

An MS, which is capable of operating in both A/Gb mode and Iu mode, shall use a valid LLC SAPI, while an MS which is capable of operating only in Iu mode shall indicate the LLC SAPI value as "LLC SAPI not assigned" in order to avoid unnecessary value range checking and any other possible confusion in the network. When the MS uses a valid LLC SAPI, the network shall return a valid LLC SAPI. The network shall return the “LLC SAPI not assigned” value only when the MS uses the “LLC SAPI not assigned” value.

NOTE 2: The radio priority level and the LLC SAPI parameters, though not used in Iu mode, shall be included in the messages, in order to support handover between Iu mode and A/Gb mode networks.

6.1.3.2.2 Unsuccessful Secondary PDP Context Activation Procedure initiated by the MS

Upon receipt of an ACTIVATE SECONDARY PDP CONTEXT REQUEST message, the network may reject the MS initiated PDP context activation by sending an ACTIVATE SECONDARY PDP CONTEXT REJECT message to the MS. The message shall contain a cause code that typically indicates one of the following:

26: insufficient resources;

30: activation rejected by GGSN;

31: activation rejected, unspecified;

32: service option not supported;

33: requested service option not subscribed;

34: service option temporarily out of order;

41: semantic error in the TFT operation;

42: syntactical error in the TFT operation;

43: unknown PDP context;

44: semantic errors in packet filter(s);

45: syntactical errors in packet filter(s);

46: PDP context without TFT already activated;

95: 111: protocol errors.

Upon receipt of an ACTIVATE SECONDARY PDP CONTEXT REJECT message, the MS shall stop timer T3380 and enter the state PDP-INACTIVE.

6.1.3.2.3 Abnormal cases

The following abnormal cases can be identified:

a) Expiry of timers

On the first expiry of the timer T3380, the MS shall resent the ACTIVATE SECONDARY PDP CONTEXT REQUEST and shall reset and restart timer T3380. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3380, the MS shall release all resources possibly allocated for this invocation and shall abort the procedure; no automatic PDP context activation re-attempt shall be performed.

b) MS initiated secondary PDP context activation procedure for an already activated PDP context (On the network side)

If the NSAPI matches that of an already activated PDP context, the network shall deactivate the existing PDP context locally without notification to the MS and proceed with the requested PDP context activation. The case of a TI match is described in subclause 8.3.2.

c) no PDP context with linked TI activated

The network shall then check whether there is an activated PDP context for the TI given in the Linked TI IE in the ACTIVATE SECONDARY PDP CONTEXT REQUEST message. If there is no active PDP context for the specified TI, the network shall reply with an ACTIVATE SECONDARY PDP CONTEXT REJECT message, cause code indicating "unknown PDP context".

If there exists a PDP context for the TI given in the Linked TI IE, then the TFT in the request message is checked for different types of TFT IE errors as follows:

a) Semantic errors in TFT operations:

1) When the *TFT operation* is an operation other than "Create a new TFT".

The network shall reject the activation request with cause "semantic error in the TFT operation".

b) Syntactical errors in TFT operations:

1) When the *TFT operation* = "Create a new TFT" and the packet filter list in the TFT IE is empty.

2) When there are other types of syntactical errors in the coding of the TFT IE, such as a mismatch between the number of packet filters subfield, and the number of packet filters in the packet filter list.

The network shall reject the activation request with cause "syntactical error in the TFT operation".

c) Semantic errors in packet filters:

1) When a packet filter consists of conflicting packet filter components which would render the packet filter ineffective, i.e. no IP packet will ever fit this packet filter. How the network determines a semantic error in a packet filter is outside the scope of the present document.

The network shall reject the activation request with cause "semantic errors in packet filter(s)".

d) Syntactical errors in packet filters:

1) When the *TFT operation* = "Create a new TFT" and two or more packet filters in the resultant TFT would have identical packet filter identifiers.

2) When the *TFT operation* = "Create a new TFT" and two or more packet filters in all TFTs associated with this PDP address and APN would have identical packet filter precedence values.

3) When there are other types of syntactical errors in the coding of packet filters, such as the use of a reserved value for a packet filter component identifier.

In case 2) the network shall not diagnose an error, further process the new activation request and, if it was processed successfully, delete the old packet filters which have identical filter precedence values. Furthermore, by means of explicit peer-to-peer signalling between the MS and the network, the network shall deactivate the PDP context(s) for which it has deleted the packet filters.

Otherwise the network shall reject the activation request with cause "syntactical errors in packet filter(s)".

Otherwise, the network shall accept the activation request by replying to the MS with an ACTIVATE SECONDARY PDP CONTEXT ACCEPT message.

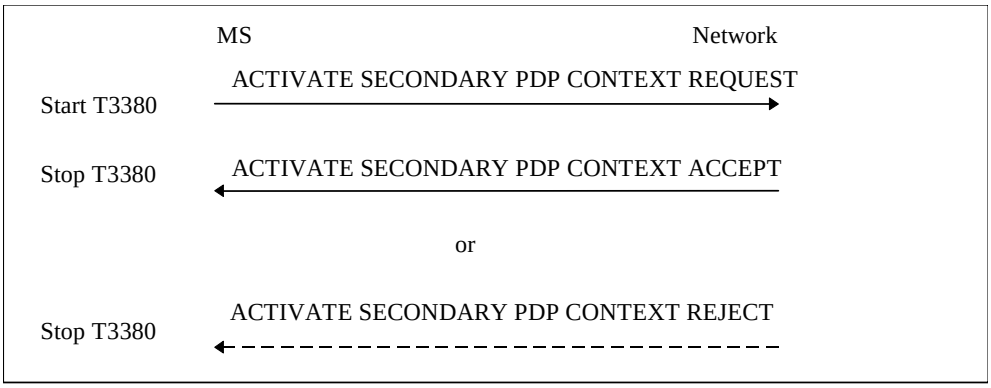


Figure 6.5/3GPP TS 24.008: MS initiated secondary PDP context activation procedure

6.1.3.3 PDP context modification procedure

The PDP context modification procedure is invoked by the network or by the MS, in order to change the QoS negotiated, the Radio priority level, or the TFT, negotiated during the PDP context activation procedure, the secondary PDP context activation procedure or at previously performed PDP context modification procedures. The MS may also create and delete a TFT in an active PDP context. The procedure can be initiated by the network or the MS at any time when a PDP context is active.

The PDP context modification procedure may also be invoked by the MS, in order to upgrade the maximum bit rate and to trigger the re-establishment of the radio access bearer for an activated PDP context which is preserved in the MS with maximum bit rate values of 0kbit/s for both uplink and downlink (see 3GPP TS 23.060 [74]). If

- the PDP Context Modification request is accepted by the network but the radio access bearer is not established; or

- the PDP Context Modification request is rejected with cause "insufficient resources" (see subclause 6.1.3.3.3),

then the MS is not required to start a new PDP Context Modification procedure or to start a Service Request procedure in order to trigger the re-establishment of the radio access bearer.

The network requested PDP context modification procedure may also be used to update the PDP address when external PDN address allocation is performed, in which case the MS receives the PDP address in the MODIFY PDP CONTEXT REQUEST (Network to MS direction) message.

NOTE: The procedure may be initiated by the network due to an inter-SGSN Routing Area Updating when a PDP context is active.

6.1.3.3.1 Network initiated PDP Context Modification

In order to initiate the procedure, the network sends the MODIFY PDP CONTEXT REQUEST message to the MS and starts timer T3386. The message shall contain the new QoS and the radio priority level and LLC SAPI that shall be used by the MS in GSM at the lower layers for the transmission of data related to the PDP context.

Upon receipt of this message the MS shall reply with the MODIFY PDP CONTEXT ACCEPT message, if the MS accepts the new QoS and the indicated LLC SAPI.

If the MS does not accept the new QoS or the indicated LLC SAPI, the MS shall initiate the PDP context deactivation procedure for the PDP context - the reject cause IE value of the DEACTIVATE PDP CONTEXT REQUEST message shall indicate "QoS not accepted".

The network shall upon receipt of the MODIFY PDP CONTEXT ACCEPT message stop timer T3386.

In A/Gb mode, the network shall establish, reconfigure or continue using the logical link with the new QoS for the LLC SAPI indicated in the MODIFY PDP CONTEXT REQUEST message.

In Iu mode, the network shall establish, reconfigure or continue using the Radio Access Bearer with the new QoS indicated in the MODIFY PDP CONTEXT REQUEST message.

6.1.3.3.2 MS initiated PDP Context Modification accepted by the network

In order to initiate the procedure, the MS sends the MODIFY PDP CONTEXT REQUEST message to the network, enters the state PDP-MODIFY-PENDING and starts timer T3381. The message may contain the requested new QoS and/or the TFT and the requested LLC SAPI (used in A/Gb mode).

Upon receipt of the MODIFY PDP CONTEXT REQUEST message, the network may reply with the MODIFY PDP CONTEXT ACCEPT message in order to accept the context modification. The reply message may contain the negotiated QoS and the radio priority level based on the new QoS profile and the negotiated LLC SAPI, that shall be used in GSM by the logical link.

Upon receipt of the MODIFY PDP CONTEXT ACCEPT message, the MS shall stop the timer T3381. If the offered QoS parameters received from the network differs from the QoS requested by the MS, the MS shall either accept the negotiated QoS or initiate the PDP context deactivation procedure.

NOTE: When modification of QoS was requested by the MS, if the network does not accept the MS request, being unable to provide the requested QoS, it should maintain the QoS negotiated as previously negotiated or propose a new QoS. Therefore, the network would not reject the MS initiated PDP context modification request due to the unavailability of the required QoS. If the MS requested a value for a QoS parameter that is not within the range specified by 3GPP TS 23.107, the network should negotiate the parameter to a value that lies within the specified range.

6.1.3.3.3 MS initiated PDP Context Modification not accepted by the network

Upon receipt of a MODIFY PDP CONTEXT REQUEST message, the network may reject the MS initiated PDP context modification request by sending a MODIFY PDP CONTEXT REJECT message to the MS. The message shall contain a cause code that typically indicates one of the following:

26: insufficient resources;

32: Service option not supported;

41: semantic error in the TFT operation;

42: syntactical error in the TFT operation;

44: semantic errors in packet filter(s);

45: syntactical errors in packet filter(s);

95 - 111: protocol errors.

If upon the reception of a MODIFY PDP CONTEXT REQUEST message the network fails to re-establish the radio access bearer for a PDP context whose maximum bit rate in uplink and downlink is set to 0kbit/s, the network shall reply with MODIFY PDP CONTEXT REJECT with cause "insufficient resources".

The TFT in the request message is checked for different types of TFT IE errors as follows:

a) Semantic errors in TFT operations:

   1) *TFT operation* = "Create a new TFT" when there is already an existing TFT for the PDP context.

   2) When the *TFT operation* is an operation other than "Create a new TFT" and there is no TFT for the PDP context.

   3) *TFT operation* = "Delete existing TFT" when there is already another PDP context with the same PDP address and APN without a TFT.

   4) *TFT operation* = "Delete packet filters from existing TFT" when it would render the TFT empty.

   In these cases the network shall not diagnose an error and perform the following actions to resolve the inconsistency:

   In case 1) the network shall further process the new activation request and, if it was processed successfully, delete the old TFT.

   In case 2) the network shall:

   - further process the new request and, if no error according to list items b), c), and d) was detected, consider the TFT as successfully deleted, if the TFT operation is "Delete existing TFT" or "Delete packet filters from existing TFT";

   - process the new request as an activation request, if the TFT operation is "Add packet filters in existing TFT" or "Replace packet filters in existing TFT".

   In case 3) the network shall process the new deletion request and, after successful deletion of the TFT, deactivate the old PDP context with the same PDP address and APN without a TFT by explicit peer-to-peer signalling between the MS and the network.

   In case 4) the network shall further process the new request and, if no error according to list items b), c), and d) was detected, delete the existing TFT. After successful deletion of the TFT, if there was already another PDP context with the same PDP address and APN without a TFT, the network shall deactivate this old PDP context without a TFT by explicit peer-to-peer signalling between the MS and the network.

b) Syntactical errors in TFT operations:

   1) When the *TFT operation* is an operation other than "Delete existing TFT" and the packet filter list in the TFT IE is empty.

2) *TFT operation* = "Delete existing TFT" with a non-empty packet filter list in the TFT IE.

3) *TFT operation* = "Replace packet filters in existing TFT" when a to be replaced packet filter does not exist in the original TFT.

4) *TFT operation* = "Delete packet filters from existing TFT" when a to be deleted packet filter does not exist in the original TFT.

5) *TFT operation* = "Delete packet filters from existing TFT" with a packet filter list also including packet filters in addition to the packet filter identifiers.

6) When there are other types of syntactical errors in the coding of the TFT IE, such as a mismatch between the number of packet filters subfield, and the number of packet filters in the packet filter list.

In case 3) the network shall not diagnose an error, further process the replace request and, if no error according to list items c) and d) was detected, include the packet filters received to the existing TFT.

In case 4) the network shall not diagnose an error, further process the deletion request and, if no error according to list items c) and d) was detected, consider the respective packet filter as successfully deleted.

Otherwise the network shall reject the modification request with cause "syntactical error in the TFT operation".

c) Semantic errors in packet filters:

When a packet filter consists of conflicting packet filter components which would render the packet filter ineffective, i.e. no IP packet will ever fit this packet filter. How the network determines a semantic error in a packet filter is outside the scope of the present document.

The network shall reject the modification request with cause "semantic errors in packet filter(s)".

d) Syntactical errors in packet filters:

1) When the *TFT operation* = "Create a new TFT" or "Add packet filters to existing TFT" and two or more packet filters in the resultant TFT would have identical packet filter identifiers.

2) When the *TFT operation* = "Create a new TFT" or "Add packet filters to existing TFT" or "Replace packet filters in existing TFT" and two or more packet filters in all TFTs associated with this PDP address and APN would have identical packet filter precedence values.

3) When there are other types of syntactical errors in the coding of packet filters, such as the use of a reserved value for a packet filter component identifier.

In case 1), if two or more packet filters with identical packet filter identifiers are contained in the new request, the network shall reject the modification request with cause "syntactical errors in packet filter(s)". Otherwise, the network shall not diagnose an error, further process the new request and, if it was processed successfully, delete the old packet filters which have the identical packet filter identifiers.

In case 2) the network shall not diagnose an error, further process the new request and, if it was processed successfully, delete the old packet filters which have identical filter precedence values. Furthermore, by means of explicit peer-to-peer signalling between the MS and the network, the network shall deactivate the PDP context(s) for which it has deleted the packet filters.

Otherwise the network shall reject the modification request with cause "syntactical errors in packet filter(s)".

Upon receipt of a MODIFY PDP CONTEXT REJECT message, the MS shall stop timer T3381 and enter the state PDP-ACTIVE.

6.1.3.3.4 Abnormal cases

a) Expiry of timers

On the network side:

On the first expiry of timer T3386, the network shall resend the MODIFY PDP CONTEXT REQUEST message reset and restart timer T3386. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3386, the network may continue to use the previously negotiated QoS or it may initiate the PDP context deactivation procedure.

In the MS:

On the first expiry of timer T3381, the MS shall resend the MODIFY PDP CONTEXT REQUEST message reset and restart timer T3381. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3381, the MS may continue to use the previously negotiated QoS or it may initiate the PDP context deactivation procedure.

b) Collision of MS and Network initiated PDP Context Modification Procedures

A collision of a MS and network initiated PDP context modification procedures is identified by the MS if a MODIFY PDP CONTEXT REQUEST message is received from the network after the MS has sent a MODIFY PDP CONTEXT REQUEST message itself, and both messages contain the same TI and the MS has not yet received a MODIFY PDP CONTEXT ACCEPT message from the network.

A collision is detected by the network in case a MODIFY PDP CONTEXT REQUEST message is received from the MS with the same TI as the MODIFY PDP CONTEXT REQUEST message sent to the MS.

In the case of such a collision, the network initiated PDP context modification shall take precedence over the MS initiated PDP context modification. The MS shall terminate internally the MS initiated PDP context modification procedure, enter the state PDP-Active and proceed with the network initiated PDP context modification procedure by sending a MODIFY PDP CONTEXT ACCEPT message. The network shall ignore the MODIFY PDP CONTEXT REQUEST message received in the state PDP-MODIFY-PENDING. The network shall proceed with the network initiated PDP context modification procedure as if no MODIFY PDP CONTEXT REQUEST message was received from the MS.

c) Collision of MS initiated PDP Context Modification Procedures and Network initiated Deactivate PDP Context Request Procedures

A collision of a MS initiated PDP context modification procedures and a network initiated PDP context deactivation procedures is identified by the MS if a DEACTIVATE PDP CONTEXT REQUEST message is received from the network after the MS has sent a MODIFY PDP CONTEXT REQUEST message, and the MS has not yet received a MODIFY PDP CONTEXT ACCEPT message from the network.

In the case of such a collision, the network initiated PDP context deactivation shall take precedence over the MS initiated PDP context modification. The MS shall terminate internally the MS initiated PDP context modification procedure, and proceed with the network initiated PDP context deactivation procedure by sending a DEACTIVATE PDP CONTEXT ACCEPT, enter the state PDP-INACTIVE. The network shall ignore the MODIFY PDP CONTEXT REQUEST message received in the state PDP-INACTIVE-PENDING. The network shall proceed with he network initiated PDP context deactivation procedure as if no MODIFY PDP CONTEXT REQUEST message was received from the MS.

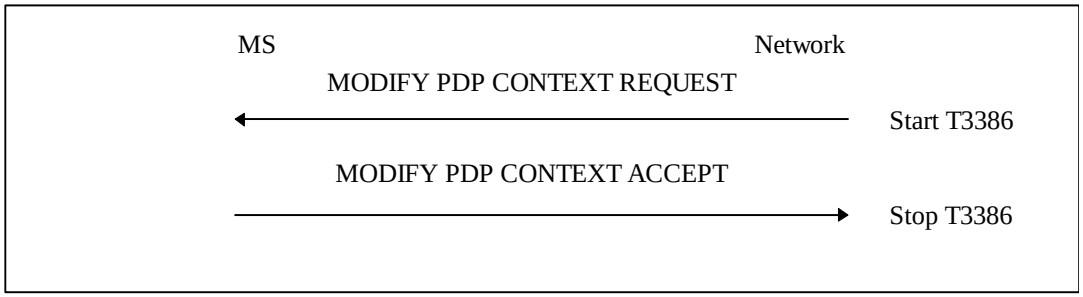


Figure 6.6/3GPP TS 24.008: Network initiated PDP context modification procedure

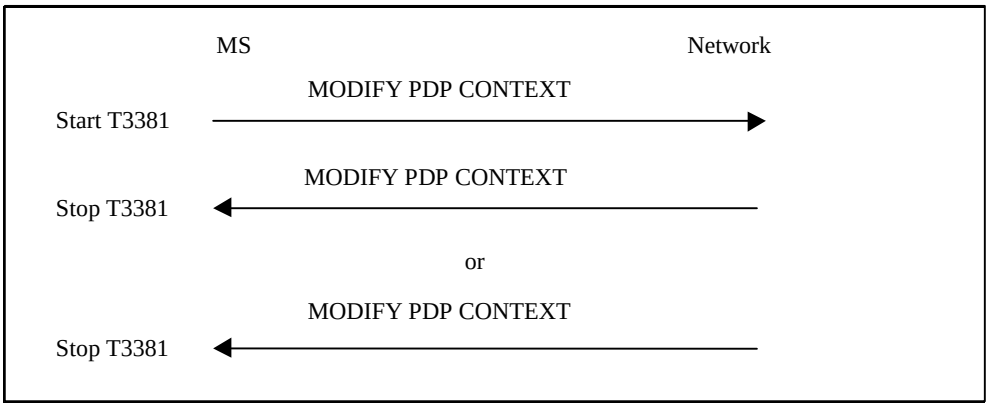


Figure 6.7/3GPP TS 24.008: MS initiated PDP context modification procedure

6.1.3.4 PDP context deactivation procedure

The purpose of this procedure is to deactivate an existing PDP context between the MS and the network. The PDP context deactivation may be initiated by the MS or by the network. The *tear down indicator* information element may be included in the DEACTIVATE PDP CONTEXT REQUEST message in order to indicate whether only the PDP context associated with this specific TI or all active PDP contexts sharing the same PDP address and APN as the PDP context associated with this specific TI shall be deactivated. If the tear down is requested, all other active PDP contexts sharing the same PDP address and APN as the PDP context associated with this specific TI shall be deactivated locally without peer-to-peer signalling. If the *tear down indicator* information element is not included in the DEACTIVATE PDP CONTEXT REQUEST message, only the PDP context associated with this specific TI shall be deactivated.

After successful PDP context deactivation, the associated NSAPI and TI values are released and can be reassigned to another PDP context.

6.1.3.4.1 PDP context deactivation initiated by the MS

In order to deactivate a PDP context, the MS sends a DEACTIVATE PDP CONTEXT REQUEST message to the network, enters the state PDP-INACTIVE-PENDING and starts timer T3390. The message contains the transaction identifier (TI) in use for the PDP context to be deactivated and a cause code that typically indicates one of the following causes:

25: LLC or SNDCP failure (A/Gb mode only);

26: insufficient resources;

36: regular deactivation; or

37: QoS not accepted.

The network shall reply with the DEACTIVATE PDP CONTEXT ACCEPT message. Upon receipt of the DEACTIVATE PDP CONTEXT ACCEPT message, the MS shall stop timer T3390.

In A/Gb mode, both the MS and the network shall initiate local release of the logical link if it is not used by another PDP context.

In Iu mode, the network shall initiate the release of Radio Access Bearer associated with this PDP context.

6.1.3.4.2 PDP context deactivation initiated by the network

In order to deactivate a PDP context, the network sends a DEACTIVATE PDP CONTEXT REQUEST message to the MS and starts timer T3395. The message contains the transaction identifier in use for the PDP context to be deactivated and a cause code that typically indicates one of the following causes:

8: Operator Determined Barring;

25: LLC or SNDCP failure (A/Gb mode only);

36: regular deactivation;

38: network failure; or

39: reactivation requested.

The MS shall, upon receipt of this message, reply with a DEACTIVATE PDP CONTEXT ACCEPT message. Upon receipt of the DEACTIVATE PDP CONTEXT ACCEPT message, the network shall stop the timer T3395.

In A/Gb mode, both the MS and the network shall initiate local release of the logical link if it is not used by another PDP context.

In Iu mode, the network shall initiate the release of Radio Access Bearer associated with this PDP context.

6.1.3.4.3 Abnormal cases

The following abnormal cases can be identified:

a) Expiry of timers

In the mobile station:

On the first expiry of timer T3390, the MS shall resent the message DEACTIVATE PDP CONTEXT REQUEST and shall reset and restart the timer T3390. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3390, the MS shall release all resources allocated and shall erase the PDP context related data.

On the network side:

On the first expiry of timer T3395, the network shall resent the message DEACTIVATE PDP CONTEXT REQUEST and shall reset and restart timer T3395. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3395, the network shall erase the PDP context related data for that MS.

b) Collision of MS and network initiated PDP context deactivation requests

If the MS and the network initiated PDP context deactivation requests collide, the MS and the network shall each reply with the messages DEACTIVATE PDP CONTEXT ACCEPT and shall stop timer T3390 and T3395, respectively.

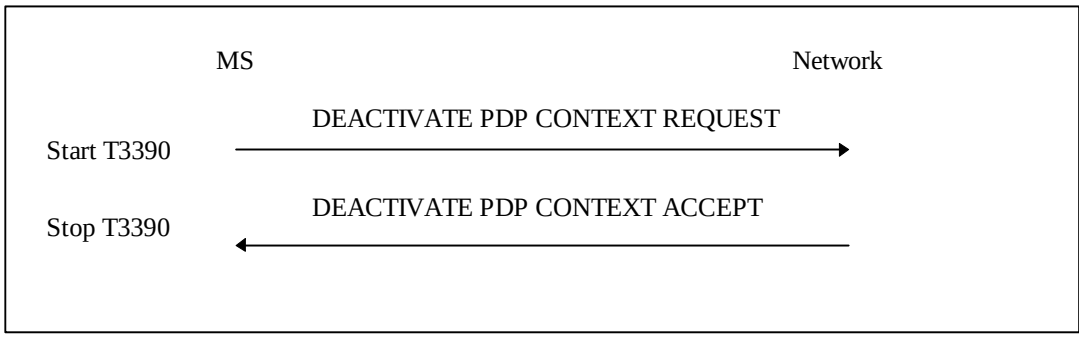


Figure 6.8/3GPP TS 24.008: MS initiated PDP context deactivation procedure

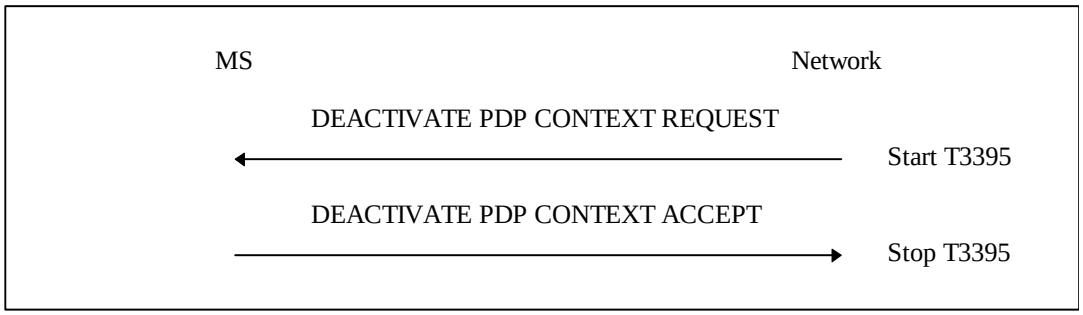


Figure 6.9/3GPP TS 24.008: Network initiated PDP context deactivation procedure

6.1.3.4a Void

6.1.3.5 Void

6.1.3.6 Receiving a SM STATUS message by a SM entity

If the SM entity of the MS receives an SM STATUS message the MS shall take different actions depending on the received SM cause value:

#81 Invalid transaction identifier value

The MS shall abort any ongoing SM procedure related to the received transaction identifier value, stop any related timer, and deactivate the corresponding PDP context locally (without peer to peer signalling between the MS and the network).

#97 Message type non-existent or not implemented

The MS shall abort any ongoing SM procedure related to the received transaction identifier value and stop any related timer.

If the SM entity of the MS receives a SM STATUS message with any other SM cause value no state transition and no specific action shall be taken as seen from the radio interface, i.e. local actions are possible.

If the SM entity of the network receives an SM STATUS message the network shall take different actions depending on the received SM cause value:

#81 Invalid transaction identifier value

The network shall abort any ongoing SM procedure related to the received transaction identifier value, stop any related timer, and deactivate the corresponding PDP context locally (without peer to peer signalling between the MS and the network).

#97 Message type non-existent or not implemented

The network shall abort any ongoing SM procedure related to the received transaction identifier value and stop any related timer.

The actions to be taken in the network on receiving a SM STATUS message with any other SM cause value are an implementation dependent option.

6.1.3.7 Protocol configuration options

The MS and the GGSN may communicate parameters by means of the protocol configuration options information element when activating, modifying or deactivating a PDP context. Such parameters can e.g. be used to convey information from external protocols between the MS and the GGSN. An overview of how the protocol configuration options information element is used is specified in 3GPP TS 27.060 [36a].

The protocol configuration options information element is transparent to the SGSN.

6.2 MBMS Session Management

6.2.1 General

The function of the MBMS Session Management (MBMS-SM) is to support the MBMS service handling within the MS and network, which allows the MS to receive data from a specific MBMS source. The MBMS-SM comprises procedures for MBMS context activation and deactivation. The MBMS-SM procedures for identified access can only be performed if a GMM context has been established between the MS and the network and the MS has a PDP context activated. If no GMM context has been established, the MM sublayer has to initiate the establishment of a GMM context by use of the GMM procedures as described in subclause 4. After GMM context establishment, MBMS-SM uses services offered by GMM (see 3GPP TS 24.007 [20]). Ongoing MBMS-SM procedures are suspended during GMM procedure execution.

In UMTS only, the MBMS protocol shall use integrity protected signalling. Integrity protection of all MBMS-SM signalling messages is the responsibility of lower layers. It is the network which activates integrity protection. This is done using the security mode control procedure (see 3GPP TS 25.331 [23c]).

For the MBMS-SM protocol, the extended TI mechanism may be used (see 3GPP TS 24.007 [20]).

6.2.2 MBMS Session Management states

In this subclause, the MBMS states are described for one MBMS-SM entity (see 3GPP TS 24.007 [20]). Each MBMS-SM entity is associated with one MBMS context. The subclause 6.2.2.1 describes the MBMS states in the MS and subclause 6.2.2.2 describes the MBMS states on the network side.

6.2.2.1 MBMS Session Management states in the MS

In this subclause, the possible states of an MBMS-SM entity in the MS are described.

6.2.2.1.1 MBMS-INACTIVE

This state indicates that no MBMS Context exists.

6.2.2.1.2 MBMS-ACTIVE-PENDING

This state exists when the MS has requested the network to activate an MBMS context.

6.2.2.1.3 MBMS-ACTIVE

This state indicates that the MBMS Context is active.

6.2.2.2 MBMS Session Management states on the network side

In this clause, the possible states of an MBMS-SM entity on the network side are described.

6.2.2.2.1 MBMS-INACTIVE

This state indicates that the MBMS Context is not active.

6.2.2.2.2 MBMS-ACTIVE-PENDING

This state exists when the network has initiated MBMS Context activation.

6.2.2.2.3 MBMS-INACTIVE-PENDING

This state exists when the network has requested the MS to deactivate an MBMS context.

~~6.2.2.2.4 MBMS-ACTIVE~~

~~This state indicates that the MBMS Context is active.~~

~~6.2.3 MBMS Session management procedures~~

6.12.3.81 MBMS context activation

The purpose of this procedure is to establish an MBMS context in the MS and in the network for a specific IP Multicast Address using a specific NSAPI for MBMS user plane transmission. The MS shall only initiate the MBMS context activation when requested by the network. However, the trigger for the activation request by the network is initiated by the MS at the application layer (see 3GPP TS 23.246 [106]).

6.12.3.81.1 Successful MBMS context activation

In order to request an MBMS context activation, the network sends a REQUEST MBMS CONTEXT ACTIVATION message to the MS, enters the state MBMS-ACTIVE-PENDING and starts timer T3385. The message shall contain the IP multicast address, the APN and the Linked NSAPI.

Upon receipt of a REQUEST MBMS CONTEXT ACTIVATION message, the MS shall validate the message by verifying the NSAPI given in the Linked NSAPI IE to be one of the active PDP context(s), and send an ACTIVATE MBMS CONTEXT REQUEST, enter state MBMS-ACTIVE-PENDING and start timer T3380. The message shall contain an IP multicast address and an APN, which shall be the same as the IP multicast address and the APN requested by the network in the REQUEST MBMS CONTEXT ACTIVATION message. Furthermore, the MS shall include the Supported MBMS bearer capabilities, i.e. the maximum downlink bit rate the MS can handle.

Upon receipt of the ACTIVATE MBMS CONTEXT REQUEST message, the network shall stop timer T3385. If the network accepts the request, it shall reply with an ACTIVATE MBMS CONTEXT ACCEPT message.

Upon receipt of the message ACTIVATE MBMS CONTEXT ACCEPT the MS shall stop timer T3380 and shall enter the state MBMS-ACTIVE.

6.21.3.81.2 Unsuccessful MBMS context activation requested by the MS

Upon receipt of an ACTIVATE MBMS CONTEXT REQUEST message the network may reject the MS initiated MBMS context activation by sending an ACTIVATE MBMS CONTEXT REJECT message to the MS. The sender of the message shall include the same TI as included in the ACTIVATE MBMS CONTEX REQUEST and an additional cause code that typically indicates one of the following causes:

8: Operator Determined Barring;

24: MBMS bearer capabilities insufficient for the service;

26: insufficient resources;

27: missing or unknown APN;

29: user authentication failed;

30: activation rejected by GGSN;

31: activation rejected, unspecified;

32: service option not supported;

33: requested service option not subscribed;

34: service option temporarily out of order; or

95 - # 111: protocol errors.

Upon receipt of an ACTIVATE MBMS CONTEXT REJECT message, the MS shall stop timer T3380 and enter/remain in state ~~MBMS~~PDP-INACTIVE.

6.~~2~~1.3.8~~1~~.3 Unsuccessful MBMS context activation requested by the network

Upon receipt of the REQUEST MBMS CONTEXT ACTIVATION message, the MS may reject the network requested MBMS context activation by sending the REQUEST MBMS CONTEXT ACTIVATION REJECT message to the network. The sender of the message shall include the same TI as included in the REQUEST MBMS CONTEXT ACTIVATION and an additional cause code that typically indicates one of the following causes:

26: insufficient resources;

31: activation rejected, unspecified;

40: feature not supported; or

95 - # 111: protocol errors.

The network shall stop timer T3385 and enter in state ~~MBMS~~PDP-INACTIVE.

6.1~~2~~.3.8~~1~~.4 Abnormal cases

The following abnormal cases can be identified:

a) Expiry of timers in the mobile station: On the first expiry of the timer T3380, the MS shall resend the ACTIVATE MBMS CONTEXT REQUEST and shall reset and restart timer T3380. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3380, the MS shall release all resources possibly allocated for this invocation and shall abort the procedure; no automatic MBMS context activation re-attempt shall be performed.

b) Expiry of timers on the network side: On the first expiry of the timer T3385, the network shall resend the message REQUEST MBMS CONTEXT ACTIVATION and shall reset and restart timer T3385. This retransmission is repeated four times, i.e. on the fifth expiry of timer T3385, the network shall release possibly allocated resources for this activation and shall abort the procedure.

c) MBMS context activation request for an already activated MBMS context (on the mobile station side): If the MS receives a REQUEST MBMS CONTEXT ACTIVATION message with the same combination of APN and IP multicast address (i.e. PDP type and PDP address) as an already activated MBMS context, the MS shall deactivate the existing MBMS context locally without notification to the network and proceed with the requested MBMS context activation.

d) MBMS context activation request for an already activated MBMS context (on the network side): If the network receives an ACTIVATE MBMS CONTEXT REQUEST message with the same combination of APN and IP multicast address (i.e. PDP type and PDP address) as an already activated MBMS context, the network shall deactivate the existing MBMS context locally without notification to the MS and proceed with the requested MBMS context activation.

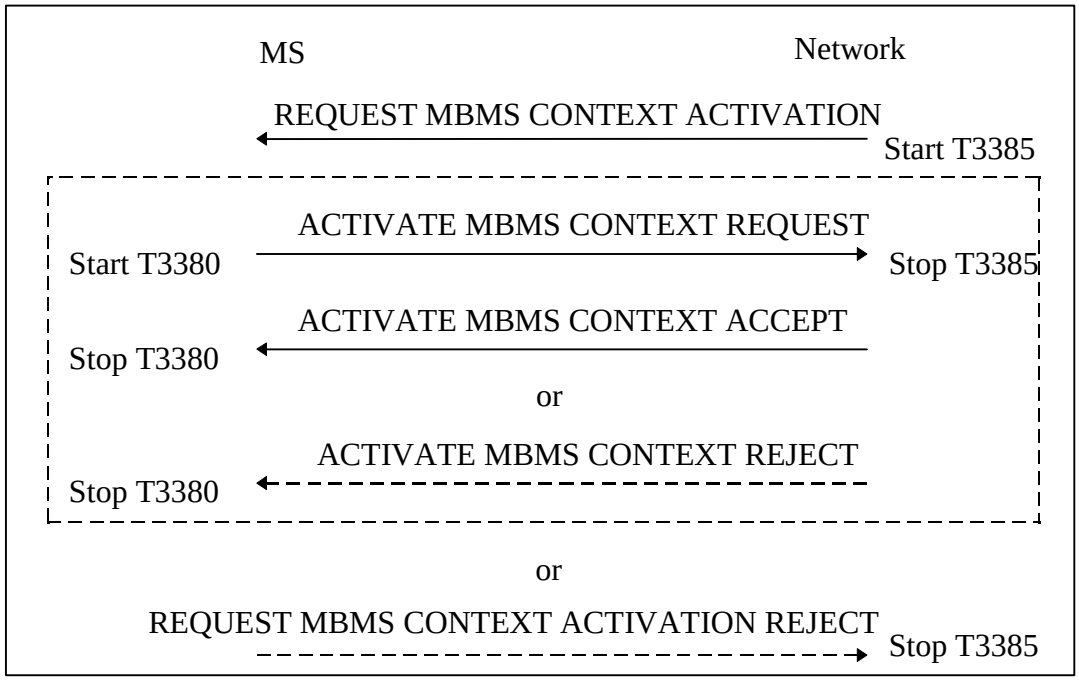


Figure 6.10/3GPP TS 24.008: MBMS context activation procedure

6.12.3.92 MBMS context deactivation

The purpose of this procedure is to deactivate an existing MBMS context in the MS and the network. The MS shall only initiate the MBMS context deactivation when requested by the network, however the trigger for the deactivation request by the network may be initiated by the MS at application layer or by the network, see 3GPP TS 23.246 [106].

After a successful MBMS context deactivation, the associated TI value shall be released in both the MS and the network.

The MBMS context deactivation procedure makes use of the messaging and signalling of the PDP context deactivation procedure as described in the subclause 6.12.3.92.1.

6.12.3.92.1 MBMS context deactivation initiated by the network

In order to request an MBMS context deactivation, the network sends a DEACTIVATE PDP CONTEXT REQUEST message to the MS, enters the state MBMS-INACTIVE-PENDING and starts timer T3395. The messages contains the transaction identifier (TI) in use for the MBMS context to be deactivated and a cause code that typically indicates one of the following causes:

36: regular deactivation;

38: network failure;

47: multicast group membership time-out.

The MS shall reply with a DEACTIVATE PDP CONTEXT ACCEPT message and enter the state ~~MBMS~~PDP-INACTIVE. Upon receipt of the DEACTIVATE PDP CONTEXT ACCEPT message, the network shall stop the timer T3395 and enter the state ~~MBMS~~PDP-INACTIVE.

6.12.3.92.2 Abnormal cases

The following abnormal cases can be identified:

a) Expiry of timers:

On the first expiry of the timer T3395, the network shall resend the message DEACTIVATE PDP CONTEXT REQUEST and shall reset and restart the timer T3395. This retransmission is repeated, i.e. on the fifth expiry of the timer T3395, the network shall erase the MBMS context related data for that MS.

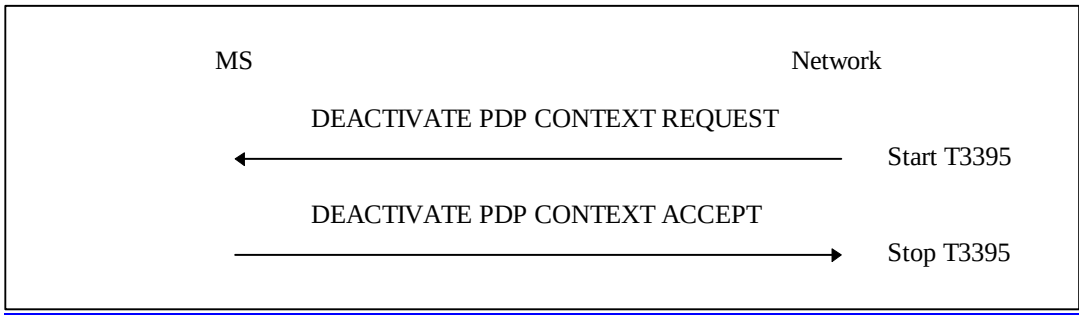


Figure 6.11/3GPP TS 24.008: MBMS context deactivation procedure

6.12.3.103 MBMS protocol configuration options

The MS and the GGSN may communicate parameters related to the MBMS bearer by means of the MBMS protocol configuration options information element when activating or deactivating an MBMS context. For example, such parameters can be used to convey information between the MS and the GGSN.

The MBMS protocol configuration options information element is transparent to the SGSN.

6.2 void

********** NEXT MODIFIED SECTION **********

11.2.3 Timers of GPRS ~~and MBMS~~ session management

Table 11.2c/3GPP TS 24.008: GPRS ~~and MBMS~~ session management timers - MS side

TIMER NUM.	TIMER VALUE	STATE	CAUSE OF START	NORMAL STOP	ON THE 1st, 2nd, 3rd, 4th EXPIRY
T3380	30s	PDP-ACTIVE-PEND or MBMS ACTIVE-PENDING	ACTIVATE PDP CONTEXT REQUEST, ACTIVATE SECONDARY PDP CONTEXT REQUEST or ACTIVATE MBMS CONTEXT REQUEST sent	ACTIVATE PDP CONTEXT ACCEPT, ACTIVATE SECONDARY PDP CONTEXT ACCEPT or ACTIVATE MBMS CONTEXT ACCEPT received ACTIVATE PDP CONTEXT REJECT, ACTIVATE SECONDARY PDP CONTEXT REJECT or ACTIVATE MBMS CONTEXT REJECT received	Retransmission of ACTIVATE PDP CONTEXT REQ, ACTIVATE SECONDARY PDP CONTEXT REQUEST or ACTIVATE MBMS CONTEXT REQUEST
T3381	8s	PDP-MODIFY-PENDING	MODIFY PDP CONTEXT REQUEST sent	MODIFY PDP CONTEXT ACCEPT received	Retransmission of MODIFY PDP CONTEXT REQUEST
T3390	8s	PDP-INACT-PEND or MBMS INACTIVE-PENDING	DEACTIVATE PDP CONTEXT REQUEST sent	DEACTIVATE PDP CONTEXT ACC received	Retransmission of DEACTIVATE PDP CONTEXT REQUEST

NOTE: Typically, the procedures are aborted on the fifth expiry of the relevant timer. Exceptions are described in the corresponding procedure description.

Table 11.2d/3GPP TS 24.008: GPRS ~~and MBMS~~ session management timers - network side

TIMER NUM.	TIMER VALUE	STATE	CAUSE OF START	NORMAL STOP	ON THE 1st, 2nd, 3rd, 4th EXPIRY
T3385	8s	PDP-ACT-PEND or MBMS ACTIVE-PENDING	REQUEST PDP CONTEXT ACTIVATION or REQUEST MBMS CONTEXT ACTIVATION sent	ACTIVATE PDP CONTEXT REQ or ACTIVATE MBMS CONTEXT REQUEST received	Retransmission of REQUEST PDP CONTEXT ACTIVATION or REQUEST MBMS CONTEXT ACTIVATION
T3386	8s	PDP-MOD-PEND	MODIFY PDP CONTEXT REQUEST sent	MODIFY PDP CONTEXT ACC received	Retransmission of MODIFY PDP CONTEXT REQ
T3395	8s	PDP-INACT-PEND or MBMS INACTIVE-PENDING	DEACTIVATE PDP CONTEXT REQUEST sent	DEACTIVATE PDP CONTEXT ACC received	Retransmission of DEACTIVATE PDP CONTEXT REQ

NOTE: Typically, the procedures are aborted on the fifth expiry of the relevant timer. Exceptions are described in the corresponding procedure description.

********** NEXT MODIFIED SECTION **********

Annex I (informative): GPRS specific cause values for GPRS Session Management ~~and MBMS Session Management~~

I.1 Causes related to nature of request

Cause value = 8 Operator Determined Barring

This cause code is used by the network to indicate that the requested service was rejected by the SGSN due to Operator Determined Barring.

Cause value = 24 MBMS bearer capabilities insufficient for the service

This cause code is used by the network to indicate that an MBMS context activation request was rejected by the network, because the MBMS bearer capabilities are insufficient for the MBMS service.

Cause value = 25 LLC or SNDCP failure (A/Gb mode only)

This cause code is used by the MS indicate that a PDP context is deactivated because of a LLC or SNDCP failure (e.g. if the SM receives a *SNSM-STATUS.request* message with cause "*DM received* " or " *invalid XID response* ", see 3GPP TS 44.065 [78])

Cause value = 26 Insufficient resources

This cause code is used by the MS or by the network to indicate that a PDP context activation request, secondary PDP context activation request, PDP context modification request, or MBMS context activation request cannot be accepted due to insufficient resources.

Cause value = 27 Unknown or missing access point name

This cause code is used by the network to indicate that the requested service was rejected by the external packet data network because the access point name was not included although required or if the access point name could not be resolved.

Cause value = 28 Unknown PDP address or PDP type

This cause code is used by the network to indicate that the requested service was rejected by the external packet data network because the PDP address or type could not be recognised.

Cause value = 29 User authentication failed

This cause code is used by the network to indicate that the requested service was rejected by the external packet data network due to a failed user authentication.

Cause value = 30 Activation rejected by GGSN

This cause code is used by the network to indicate that the requested service was rejected by the GGSN.

Cause value = 31 Activation rejected, unspecified

This cause code is used by the network to indicate that the requested service was rejected due to unspecified reasons.

Cause value = 32 Service option not supported

This cause code is used by the network when the MS requests a service which is not supported by the PLMN.

Cause value = 33 Requested service option not subscribed

See Annex G, clause 4.

Cause value = 34 Service option temporarily out of order

See Annex G, clause 4.

Cause value = 35 NSAPI already used

This cause code may be used by a network to indicate that the NSAPI requested by the MS in the PDP context activation request is already used by another active PDP context of this MS.

Never to be sent, but can be received from a R97/R98 network at PDP context activation

Cause value = 36 Regular deactivation

This cause code is used to indicate a regular MS or network initiated PDP context deactivation or a regular network initiated MBMS context deactivation.

Cause value = 37 QoS not accepted

This cause code is used by the MS if the new QoS cannot be accepted that were indicated by the network in the PDP Context Modification procedure.

Cause value = 38 Network failure

This cause code is used by the network to indicate that the PDP context deactivation or the MBMS context deactivation is caused by an error situation in the network.

Cause value = 39 Reactivation requested

This cause code is used by the network to request a PDP context reactivation after a GGSN restart.

Cause value = 40 Feature not supported

This cause code is used by the MS to indicate that the PDP context activation or the MBMS context activation initiated by the network is not supported by the MS.

Cause value = 41 semantic error in the TFT operation.

This cause code is used by the network to indicate that the there is a semantic error in the TFT operation included in a secondary PDP context activation request or an MS-initiated PDP context modification.

Cause value = 42 syntactical error in the TFT operation.

This cause code is used by the network to indicate that there is a syntactical error in the TFT operation included in a secondary PDP context activation request or an MS-initiated PDP context modification.

Cause value = 43 unknown PDP context

This cause code is used by the network to indicate that the PDP context identified by the Linked TI IE the secondary PDP context activation request is not active.

Cause value = 44 semantic errors in packet filter(s)

This cause code is used by the network to indicate that there is one or more semantic errors in packet filter(s) of the TFT included in a secondary PDP context activation request or an MS-initiated PDP context modification.

Cause value = 45 syntactical error in packet filter(s)

This cause code is used by the network to indicate that there is one or more syntactical errors in packet filter(s) of the TFT included in a secondary PDP context activation request or an MS-initiated PDP context modification.

Cause value = 46 PDP context without TFT already activated

This cause code is used by the network to indicate that the network has already activated a PDP context without TFT.

Cause value = 47 Multicast group membership time-out

This cause code is used by the network to indicate that the MBMS context is deactivated because the timer supervising the IGMP group membership interval (see RFC 3376 [107], subclause 8.4) or the MLD multicast listener interval (see RFC 2710 [108], subclause 7.4) expired.

Cause value = 112 APN restriction value incompatible with active PDP context.

This cause code is used by the network to indicate that a requested primary PDP context or an MBMS context has an APN restriction value that is not allowed in combination with a currently active PDP context. Restriction values are defined in 3GPP TS 23.060 [74], subclause 15.4.

I.2 Causes related to invalid messages

Cause value = 81 Invalid transaction identifier value.

See annex H, subclause H.5.1.

Cause value = 95 Semantically incorrect message.

See annex H, subclause H.5.5.

Cause value = 96 Invalid mandatory information.

See annex H, subclause H.6.1.

Cause value = 97 Message type non-existent or not implemented.

See annex H, subclause H.6.2.

Cause value = 98 Message not compatible with protocol state.

See annex H, subclause H.6.3.

Cause value = 99 Information element non-existent or not implemented.

See annex H, subclause H.6.4.

Cause value = 100 Conditional IE error.

See annex H, subclause H.6.5.

Cause value = 101 Message not compatible with protocol state.

See annex H, subclause H.6.6.

Cause value = 111 Protocol error, unspecified.

See annex H, subclause H.6.8.

I.3 void~~Additional causes for MBMS Session Management~~

~~Cause value = 24 MBMS bearer capabilities insufficient for the service~~

~~This cause code is used by the network to indicate that an MBMS context activation request was rejected by the network, because the MBMS bearer capabilities are insufficient for the MBMS service.~~

~~Cause value = 47 Multicast group membership time-out~~

~~This cause code is used by the network to indicate that the MBMS context is deactivated because the timer supervising the IGMP group membership interval (see RFC 3376 [107], subclause 8.4) or the MLD multicast listener interval (see RFC 2710 [108], subclause 7.4) expired.~~

3GPP TSG-CN1 Meeting #37
Sydney, Australia, 14-18 February 2005

Tdoc N1-050309
(rev of Tdoc N1-050198)

CR-Form-v7.1

CHANGE REQUEST

⌘ **24.008** **CR** **956** ⌘ **rev** **1** ⌘ Current version: **6.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Introduction of MBMS in clause 8
Source:	⌘	Siemens AG
Work item code:	⌘	MBMS, TEI6
Date:	⌘	15.02.2005
Category:	⌘	**B**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
Ph2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
Rel-4 *(Release 4)*
Rel-5 *(Release 5)*
Rel-6 *(Release 6)*
Rel-7 *(Release 7)*

Reason for change: ⌘

1) Since new procedures and messages were introduced for MBMS, the protocol error handling in clause 8 needs to be adapted.

2) Rules for the handling of a mandatory information element error in the messages ACTIVATE SECONDARY PDP CONTEXT REQUEST and (MS initiated) MODIFY PDP CONTEXT REQUEST are missing in subclause 8.5.5, although the procedural description in clause 6 suggests that in these cases the network replies with a reject message instead of an SM-STATUS message.

3) In subclause 8.5.5 c), the name of the message REQUEST PDP CONTEXT REJECT is incorrect.

4) In subclause 8.8, there is no rule for the handling of semantic information element errors for GMM and SM.

Summary of change: ⌘

1) Rules for the new MBMS related SM messages are added to subclauses 8.3 and 8.5.5.

2) Missing Rules for the handling of a mandatory information element error in the messages ACTIVATE SECONDARY PDP CONTEXT REQUEST and (MS initiated) MODIFY PDP CONTEXT REQUEST are added to subclause 8.5.5.

3) The name of the message is corrected to REQUEST PDP CONTEXT **ACTIVATION** REJECT in subclause 8.5.5 c).

4) A rule for the handling of semantic information element errors for GMM and SM is added to subclause 8.8.

Consequences if not approved:	⌘	Incomplete specification, which can lead to different implementations. If the behaviour of the MS is not predictable, it may become difficult later to enhance the protocol in a backwards compatible way.

Clauses affected:	⌘	8.3.2, 8.5, 8.5.5, 8.8			
Other specs affected:	⌘	**Y** / **N**		⌘	
			X Other core specifications		
			X Test specifications		
			X O&M Specifications		
Other comments:	⌘	Approval of CR 24.008-954 rev1 (N1-050308) is a precondition for the approval of this CR.			

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

8 Handling of unknown, unforeseen, and erroneous protocol data

8.1 General

The procedures specified in 3GPP TS 24.008 and call-related supplementary service handling in 3GPP TS 24.010 [21] apply to those messages which pass the checks described in this subclause.

This subclause also specifies procedures for the handling of unknown, unforeseen, and erroneous protocol data by the receiving entity. These procedures are called "error handling procedures", but in addition to providing recovery mechanisms for error situations they define a compatibility mechanism for future extensions of the protocols.

Error handling concerning the value part of the Facility IE and of the SS Version Indicator IE are not in the scope of the present document. It is defined in 3GPP TS 24.010 [21] and the 3GPP TS 24.08x series.

Sub subclauses 8.1 to 8.8 shall be applied in order of precedence.

Most error handling procedures are mandatory for the mobile station.

Detailed error handling procedures in the network are implementation dependent and may vary from PLMN to PLMN. However, when extensions of this protocol are developed, networks will be assumed to have the error handling that is indicated in this subclause as mandatory ("shall") and that is indicated as strongly recommended ("should"). Subclauses 8.2, 8.3, 8.4, 8.5 and 8.7.2 do not apply to the error handling in the network applied to the receipt of initial layer 3 message: If the network diagnoses an error described in one of these subclause s in the initial layer 3 message received from the mobile station, it shall either:

- try to recognize the classmark and then take further implementation dependent actions; or
- release the RR-connection.

Also, the error handling of the network is only considered as mandatory or strongly recommended when certain thresholds for errors are not reached during a dedicated connection.

For definition of semantical and syntactical errors see 3GPP TS 24.007 [20], subclause 11.4.2.

8.2 Message too short

When a message is received that is too short to contain a complete message type information element, that message shall be ignored, cf. 3GPP TS 24.007 [20].

8.3 Unknown or unforeseen transaction identifier

8.3.1 Call Control

The mobile station and the network shall ignore a Call Control message received with TI EXT bit = 0. Otherwise, if the TI EXT bit =1 or no extension is used, the behaviour described below shall be followed.

The mobile station and network shall reject a SETUP, EMERGENCY SETUP or START CC message received with octet 1 part of the TI value coded as "111" by sending RELEASE COMPLETE with cause #81 "Invalid transaction identifier value" The TI value in RELEASE COMPLETE shall be the complete TI value including the extension octet from the message that caused the rejection.

Any message other than SETUP, EMERGENCY SETUP or START CC received with octet 1 part of the TI value coded as "111" shall be ignored.

For a call control message received with octet 1 part of the TI value not coded as "111", the following procedures shall apply:

a) For a network that does not support the "Network initiated MO call" option and for all mobile stations:

Whenever any call control message except EMERGENCY SETUP, SETUP or RELEASE COMPLETE is received specifying a transaction identifier which is not recognized as relating to an active call or to a call in progress, the receiving entity shall send a RELEASE COMPLETE message with cause #81 "invalid transaction identifier value" using the received transaction identifier value and remain in the Null state.

For a network that does support the "Network initiated MO call" option $(CCBS)$:

Whenever any call control message except EMERGENCY SETUP, SETUP, START CC or RELEASE COMPLETE is received specifying a transaction identifier which is not recognized as relating to an active call or to a call in progress, the receiving entity shall send a RELEASE COMPLETE message with cause #81 "invalid transaction identifier value" using the received transaction identifier value and remain in the Null state.

b) When a RELEASE COMPLETE message is received specifying a transaction identifier which is not recognized as relating to an active call or to a call in progress, the MM connection associated with that transaction identifier shall be released.

c) For a network that does not support the "Network initiated MO call" option and for all mobile stations:

When an EMERGENCY SETUP or, a SETUP message is received specifying a transaction identifier which is not recognized as relating to an active call or to a call in progress, and with a transaction identifier flag incorrectly set to "1", this message shall be ignored.

For a network that does support the "Network initiated MO call" option $(CCBS)$:

When an EMERGENCY SETUP, a START CC or, a SETUP message is received specifying a transaction identifier which is not recognised as relating to an active call or to a call in progress, and with a transaction identifier flag incorrectly set to "1", this message shall be ignored.

d) When a SETUP message is received by the mobile station specifying a transaction identifier which is recognized as relating to an active call or to a call in progress, this SETUP message shall be ignored.

e) For a network that does not support the "Network initiated MO call" option:

When an EMERGENCY SETUP message or a SETUP message is received by the network specifying a transaction identifier which is recognized as relating to an active call or to a call in progress, this message need not be treated and the network may perform other actions.

For a network that does support the "Network initiated MO call" option $(CCBS)$:

When an EMERGENCY SETUP message or a START CC message is received by the network specifying a transaction identifier which is recognised as relating to an active call or to a call in progress, this message need not be treated and the network may perform other actions.

The same applies to a SETUP message unless the transaction has been established by a START_CC message and the network is in the "recall present" state (N0.6).

8.3.2 Session Management

The mobile station and network shall ignore a session management message with TI EXT bit = 0. Otherwise, the following procedures shall apply:

a) Whenever any session management message except ACTIVATE PDP CONTEXT REQUEST, ACTIVATE SECONDARY PDP CONTEXT REQUEST, or SM-STATUS is received by the network specifying a transaction identifier which is not recognized as relating to an active PDP context or MBMS context, or to a PDP context or MBMS context that is in the process of activation or deactivation, the network shall send a SM-STATUS message with cause #81 "invalid transaction identifier value" using the received transaction identifier value including the extension octet and remain in the PDP-INACTIVE state.

b) Whenever any session management message except REQUEST PDP CONTEXT ACTIVATION, REQUEST MBMS CONTEXT ACTIVATION, or SM-STATUS is received by the MS specifying a transaction identifier which is not recognized as relating to an active context or to a context that is in the process of activation or deactivation, the MS shall send a SM-STATUS message with cause #81 "invalid transaction identifier value"

using the received transaction identifier value including the extension octet and remain in the PDP-INACTIVE state.

c) When a REQUEST PDP CONTEXT ACTIVATION message or REQUEST MBMS CONTEXT ACTIVATION message is received by the MS with a transaction identifier flag set to "1", this message shall be ignored.

d) When an ACTIVATE PDP CONTEXT REQUEST message is received by the network specifying a transaction identifier which is not recognized as relating to a PDP context that is in the process of activation, and with a transaction identifier flag set to "1", this message shall be ignored.

e) Whenever an ACTIVATE PDP CONTEXT REQUEST or ACTIVATE SECONDARY PDP CONTEXT REQUEST message is received by the network specifying a transaction identifier relating to a PDP context or MBMS context not in state PDP-INACTIVE, the network shall deactivate the old PDP context or MBMS context relating to the received transaction identifier without notifying the MS. Furthermore, the network shall continue with the activation procedure of a new PDP context as indicated in the received message.

Whenever an ACTIVATE MBMS CONTEXT REQUEST message is received by the network specifying a transaction identifier relating to an MBMS context not in state PDP-INACTIVE, the network shall deactivate the old MBMS context relating to the received transaction identifier without notifying the MS. Furthermore, the network shall continue with the activation procedure of a new MBMS context as indicated in the received message.

f) Whenever a REQUEST PDP CONTEXT ACTIVATION message is received by the MS specifying a transaction identifier relating to a PDP context or MBMS context not in state PDP-INACTIVE, the MS shall locally deactivate the old PDP context or MBMS context relating to the received transaction identifier. Furthermore, the MS shall continue with the activation procedure of a new PDP context as indicated in the received message.

Whenever a REQUEST MBMS CONTEXT ACTIVATION message is received by the MS specifying a transaction identifier relating to a PDP context or MBMS context not in state PDP-INACTIVE, the MS shall locally deactivate the old PDP context or MBMS context relating to the received transaction identifier. Furthermore, the MS shall continue with the activation procedure of a new MBMS context as indicated in the received message.

g) When an ACTIVATE SECONDARY PDP CONTEXT REQUEST message is received by the network with a transaction identifier flag set to "1", this message shall be ignored.

8.4 Unknown or unforeseen message type

If a mobile station receives an RR, MM or CC message with message type not defined for the PD or not implemented by the receiver in unacknowledged mode, it shall ignore the message.

If a mobile station receives an RR, MM or CC message with message type not defined for the PD or not implemented by the receiver in acknowledged mode, it shall return a status message (STATUS, MM STATUS depending on the protocol discriminator) with cause # 97 "message type non-existent or not implemented".

If a mobile station receives a GMM message or SM message with message type not defined for the PD or not implemented by the receiver, it shall return a status message (GMM STATUS or SM STATUS depending on the protocol discriminator) with cause # 97 "message type non-existent or not implemented".

If the network receives an MM message with message type not defined for the PD or not implemented by the receiver in a protocol state where reception of an unsolicited message with the given PD from the mobile station is not foreseen in the protocol, the network actions are implementation dependent. Otherwise, if the network receives a message with message type not defined for the PD or not implemented by the receiver, it shall ignore the message except that it should return a status message (STATUS, MM STATUS, GMM STATUS or SM STATUS depending on the protocol discriminator) with cause #97 "message type non-existent or not implemented".

NOTE: A message type not defined for the PD in the given direction is regarded by the receiver as a message type not defined for the PD, see 3GPP TS 24.007 [20].

If the mobile station receives a message not compatible with the protocol state, the mobile station shall ignore the message except for the fact that, if an RR connection exists, it returns a status message (STATUS, MM STATUS depending on the protocol discriminator) with cause #98 "Message type not compatible with protocol state". When the message was a GMM message the GMM-STATUS message with cause #98 "Message type not compatible with protocol state" shall be returned. When the message was a SM message the SM-STATUS message with cause #98 "Message type not compatible with protocol state" shall be returned.

If the network receives a message not compatible with the protocol state, the network actions are implementation dependent.

NOTE: The use by GMM and SM of unacknowledged LLC may lead to messages "not compatible with the protocol state".

8.5 Non-semantical mandatory information element errors

When on receipt of a message,

- an "imperative message part" error; or
- a "missing mandatory IE" error;

is diagnosed or when a message containing:

- a syntactically incorrect mandatory IE; or
- an IE unknown in the message, but encoded as "comprehension required" (see 3GPP TS 24.007); or
- an out of sequence IE encoded as "comprehension required" (see 3GPP TS 24.007) is received,

the mobile station shall proceed as follows:

If the message is not one of the messages listed in subclauses 8.5.1, 8.5.2, 8.5.3, 8.5.4 and 8.5.5 a), b) or f~~b~~), the mobile station shall ignore the message except for the fact that, if an RR connection exists, it shall return a status message (STATUS, MM STATUS depending on the protocol discriminator) with cause # 96 "Invalid mandatory information". If the message was a GMM message the GMM-STATUS message with cause #96 " Invalid mandatory information" shall be returned. If the message was an SM message the SM-STATUS message with cause # 96 "invalid mandatory information" shall be returned.

- the network shall proceed as follows:

When the message is not one of the messages listed in subclause 8.5.3 b), c), d) or e) and 8.5.5 a), c), d), e) or g~~e~~), the network shall either:

- try to treat the message (the exact further actions are implementation dependent), or
- ignore the message except that it should return a status message (STATUS, or MM STATUS (depending on the protocol discriminator), GMM STATUS, or SM STATUS) with cause # 96 "Invalid mandatory information".

8.5.1 Radio resource management

See 3GPP TS 44.018 [84].

8.5.2 Mobility management

No exceptional cases are described for mobility management messages.

8.5.3 Call control

a) If the message is a SETUP message, a RELEASE COMPLETE message with cause # 96 "invalid mandatory information" shall be returned.

b) If the message is a DISCONNECT message, a RELEASE message shall be returned with cause value # 96 "invalid mandatory information" and subclause 5.4. "call clearing" applies as normal.

c) If the message is a RELEASE message, a RELEASE COMPLETE message shall be returned with cause value # 96 "invalid mandatory information".

d) If the message is a RELEASE COMPLETE message, it shall be treated as a normal RELEASE COMPLETE message.

e) If the message is a HOLD REJECT or RETRIEVE REJECT message, it shall be treated as a normal HOLD REJECT or RETRIEVE REJECT message.

f) If the message is a STATUS message and received by the network, a RELEASE COMPLETE message may be returned with cause value # 96 "invalid mandatory information".

8.5.4 GMM mobility management

No exceptional cases are described for mobility management messages.

8.5.5 Session management

a) If the message is a DEACTIVATE PDP CONTEXT REQUEST, a DEACTIVATE PDP CONTEXT ACCEPT message shall be returned. All resources allocated for that context shall be released.

b) If the message is a REQUEST PDP CONTEXT ACTIVATION, a REQUEST PDP CONTEXT ACTIVATION REJECT message with cause # 96 "Invalid mandatory information" shall be returned.

c) If the message is an ACTIVATE PDP CONTEXT REQUEST, an ACTIVATE PDP CONTEXT REJECT message with cause # 96 "Invalid mandatory information" shall be returned.

d) If the message is an ACTIVATE SECONDARY PDP CONTEXT REQUEST, an ACTIVATE SECONDARY PDP CONTEXT REJECT message with cause # 96 "Invalid mandatory information" shall be returned.

e) If the message is a MODIFY PDP CONTEXT REQUEST, a MODIFY PDP CONTEXT REJECT message with cause # 96 "Invalid mandatory information" shall be returned.

f) If the message is a REQUEST MBMS CONTEXT ACTIVATION, a REQUEST MBMS CONTEXT ACTIVATION REJECT message with cause # 96 "Invalid mandatory information" shall be returned.

g) If the message is an ACTIVATE MBMS CONTEXT REQUEST, an ACTIVATE MBMS CONTEXT REJECT message with cause # 96 "Invalid mandatory information" shall be returned.

8.6 Unknown and unforeseen IEs in the non-imperative message part

8.6.1 IEIs unknown in the message

The MS shall ignore all IEs unknown in a message which are not encoded as "comprehension required" (see 3GPP TS 24.007).

The network shall take the same approach.

8.6.2 Out of sequence IEs

The MS shall ignore all out of sequence IEs in a message which are not encoded as "comprehension required" (see 3GPP TS 24.007).

The network should take the same approach.

8.6.3 Repeated IEs

If an information element with format T, TV, or TLV is repeated in a message in which repetition of the information element is not specified in clause 9 of the present document, only the contents of the information element appearing first shall be handled and all subsequent repetitions of the information element shall be ignored. When repetition of information elements is specified, only the contents of specified repeated information elements shall be handled. If the limit on repetition of information elements is exceeded, the contents of information elements appearing first up to the limit of repetitions shall be handled and all subsequent repetitions of the information element shall be ignored.

The network should follow the same procedures.

8.7 Non-imperative message part errors

This category includes:

- syntactically incorrect optional IEs;
- conditional IE errors.

8.7.1 Syntactically incorrect optional IEs

The MS shall treat all optional IEs that are syntactically incorrect in a message as not present in the message.

The network shall take the same approach.

8.7.2 Conditional IE errors

When the MS upon receipt of an RR, MM or CC message diagnoses a "missing conditional IE" error or an "unexpected conditional IE" error or when it receives an RR, MM or CC message containing at least one syntactically incorrect conditional IE, it shall ignore the message except for the fact that, if an RR connection exists, it shall return a status message (STATUS, or MM STATUS depending on the PD) with cause value # 100 "conditional IE error".

When the MS upon receipt of a GMM or SM message diagnoses a "missing conditional IE" error or an "unexpected conditional IE" error or when it receives a GMM or SM message containing at least one syntactically incorrect conditional IE, it shall ignore the message and it shall return a status message (GMM STATUS or SM STATUS depending on the PD) with cause value # 100 "conditional IE error".

When the network receives a message and diagnose a "missing conditional IE" error or an "unexpected conditional IE" error or when it receives a message containing at least one syntactically incorrect conditional IE, the network shall either

- try to treat the message (the exact further actions are implementation dependent), or
- ignore the message except that it should return a status message (STATUS, MM STATUS, GMM STATUS or SM STATUS depending on the protocol discriminator) with cause # 100 "conditional IE error".

8.8 Messages with semantically incorrect contents

When a message with semantically incorrect contents is received, the foreseen reactions of the procedural part of 3GPP TS 24.008 (i.e. of clauses 3, 4, 5, 6) are performed. If however no such reactions are specified, the MS shall ignore the message except for the fact that, if an RR connection exists, it returns a status message (STATUS, or MM STATUS depending on the PD) with cause value # 95 "semantically incorrect message". If the message was a GMM message the GMM-STATUS message with cause #95 "semantically incorrect message" shall be returned. If the message was an SM message the SM-STATUS message with cause # 95 "semantically incorrect message" shall be returned.

The network should follow the same procedure except that a status message is not normally transmitted.

Semantic checking of the Facility information element value part (defined in 3GPP TS 24.080 [24]) is the subject of the technical specifications 3GPP TS 24.010 [21] and the 3GPP TS 24.08x series.