3GPP TSG_CN#7/ ***TSG_CN#7 NP-000130***
ETSI SMG3 Plenary Meeting, Madrid, Spain
13-15 March 2000

Source: ASCI rapporteurs / STF 139 / UIC / Nortel / Siemens / Kapsch / Sagem
Agenda item: 5.3

Document for: Approval
Subject: Notification response as an RR message

The ASCI rapporteurs have discovered that several change requests have to be urgently approved in order to move the NOTIFICATION RESPONSE message from the MM sub-layer to the GSM RR sub-layer.

The MM related CRs to 24.008 and 04.08 are presented to CN#7 /SMG3 for approval and are attached:

Spec	CR	Rv	Ph	Cat	Vers Old	Subject	Workitem	Remarks
04.08	A1009		R96	F	5.14.0	Moving NOTIFICATION RESPONSE from MM to GSM RR	ASCI	
04.08	A1011		R97	A	6.7.0	Moving NOTIFICATION RESPONSE from MM to GSM RR	ASCI	
04.08	A1013		R98	A	7.4.0	Moving NOTIFICATION RESPONSE from MM to GSM RR	ASCI	
04.08	183		R99	A	3.2.1	Moving NOTIFICATION RESPONSE from MM to GSM RR	ASCI	

The RR related CRs to 04.08 and 04.18 will be presented to SMG2. A draft is attached for information.

The CRs have only impact on equipment implementing the ASCI features Voice Group Call Service (VGCS) and Voice Broadcast Service (VBS) and are supported by companies currently implementing these features: Nortel, Siemens, Kapsch and Sagem.

Below, you find an explanation
1) why the CRs are needed,
2) why it is urgent to approve the radio interface CRs now
3) why it was not possible to present the radio interface CRs to CN1.

1 Why are the CRs needed

An ongoing voice group call or voice broadcast call is notified in all cells of the call.

The notification response procedure is triggered in a cell by the network not describing the group call or broadcast call channel in a cell. It is not used for any other GSM or UMTS feature.

The notifications response serves two purposes:

a) To allow the network authentication of the listening subscribers
b) To allow the network to assign a group call channel only when there is a need. In realistic scenarios (shunting group) around 50% of the resources could be saved.

Today, the NOTIFICATION RESPONSE is an MM message. This is cumbersome for the second application (purpose b) above as it would

a) generate high load of the A interface
b) not allow the BSS to decide autonomously on the application of the radio resource optimization.

It is therefore proposed to change the specification and to specify NOTIFICATION RESPONSE as an RR message. This would allow a proper solution for purpose b). Purpose a) is still possible as a corresponding modification of the A interface is envisaged to add the necessary BSSAP information flow (similar to paging response). This would be a R2000 feature.

However, the change of the Um interface cannot be restricted to some releases as this would lead to a severe incompatibility.

2 Why it is urgent to approve the radio interface CRs now

All manufacturers engaged in the matter have agreed that it is still possible to perform the Um change for all releases, however this would have to be done immediately, because equipment is already produced.

3 Why it was not possible to present the radio interface CRs to CN1

The mobile manufacturers had to examine all consequences of this change (type approval, testing etc.) This has been completed on 10 March 2000.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

04.08	CR	A1009	Current Version:	5.14.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: CN#7 *list expected approval meeting # here ↑*	for approval	X	strategic		*(for SMG use only)*
	for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [X]

Source: ASCI rapporteurs / STF 139 / UIC / Nortel / Siemens / Kapsch / Sagem **Date:** 10.03.00

Subject: Moving NOTIFICATION RESPONSE from MM to GSM RR

Work item: ASCI

Category: *(only one category shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	X
Release 97	
Release 98	X
Release 99	
Release 00	

Reason for change: Up to now, the Notification Response procedure is defined in 04.08 as an MM procedure. It should be moved from MM to RR and then the procedure terminates at the BSS. This is motivated by the following reasons:

- the procedure would be quicker;
- the signaling load in the BSC and in the MSC would be decreased;
- this would not require the allocation of temporary resources (except on the radio interface).

Clauses affected: 4.5.1.1, 9.2, 9.2.20, 10.4

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs: CR 04.08-A1011, CR 04.08-A1013, CR 24.008-183, CR 04.08-A716, CR 04.08-A718, CR 04.08-A720
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

4.5.1.1 MM connection establishment initiated by the mobile station

Upon request of a CM entity to establish an MM connection the MM sublayer first decides whether to accept, delay, or reject this request:

- An MM connection establishment may only be initiated by the mobile station when the following conditions are fulfilled:

  - Its update status is UPDATED.

  - The MM sublayer is in one of the states MM IDLE or MM connection active but not in MM connection active (Group call).

  An exception from this general rule exists for emergency calls (see section 4.5.1.5). A further exception is defined in the following clause.

- If an MM specific procedure is running at the time the request from the CM sublayer is received, and the LOCATION UPDATING REQUEST message has been sent, the request will either be rejected or delayed, depending on implementation, until the MM specific procedure is finished and, provided that the network has not sent a "follow-on proceed" indication, the RR connection is released. If the LOCATION UPDATING REQUEST message has not been sent, the mobile station may include a "follow-on request" indicator in the message. The mobile station shall then delay the request until the MM specific procedure is completed, when it may be given the opportunity by the network to use the RR connection: see section 4.4.4.6.

In order to establish an MM connection, the mobile station proceeds as follows:

a) If no RR connection exists, the MM sublayer requests the RR sublayer to establish an RR connection and enters MM sublayer state WAIT FOR RR CONNECTION (MM CONNECTION). This request contains an establishment cause and a CM SERVICE REQUEST ~~or NOTIFICATION RESPONSE~~ message. When the establishment of an RR connection is indicated by the RR sublayer (this indication implies that the CM SERVICE REQUEST ~~or NOTIFICATION RESPONSE~~ message has been successfully transferred via the radio interface, see section 2.2), the MM sublayer of the mobile station starts timer T3230, gives an indication to the CM entity that requested the MM connection establishment, and enters MM sublayer state WAIT FOR OUTGOING MM CONNECTION.

b) If an RR connection is available, the MM sublayer of the mobile station sends a CM SERVICE REQUEST ~~or NOTIFICATION RESPONSE~~ message to the network, starts timer T3230, gives an indication to the CM entity that requested the MM connection establishment, and enters:

   - MM sublayer state WAIT FOR OUTGOING MM CONNECTION, if no MM connection is active;

   - MM sublayer state WAIT FOR ADDITIONAL OUTGOING MM CONNECTION, if at least one MM connection is active;

   - If an RR connection exists but the mobile station is in the state WAIT FOR NETWORK COMMAND then any requests from the CM layer that are received will either be rejected or delayed until this state is left.

c) Only applicable for mobile stations supporting VGCS talking:

If a mobile station which is in the MM sublayer state MM IDLE, service state RECEIVING GROUP CALL (NORMAL SERVICE), receives a request from the GCC sublayer to perform an uplink access, the MM sublayer requests the RR sublayer to perform an uplink access procedure and enters MM sublayer state WAIT FOR RR CONNECTION (GROUP TRANSMIT MODE).

When a successful uplink access is indicated by the RR sublayer, the MM sublayer of the mobile station gives an indication to the GCC sublayer and enters MM sublayer state MM CONNECTION ACTIVE (GROUP TRANSMIT MODE).

When an uplink access reject is indicated by the RR sublayer, the MM sublayer of the mobile station gives an indication to the GCC sublayer and enters the MM sublayer state MM IDLE, service state RECEIVING GROUP CALL (NORMAL SERVICE).

In the network, if an uplink access procedure is performed, the RR sublayer in the network provides an indication to the MM sublayer together with the mobile subscriber identity received in the TALKER INDICATION message. The network shall then enter the MM sublayer state MM CONNECTION ACTIVE (GROUP TRANSMIT MODE).

The CM SERVICE REQUEST message contains the

- mobile identity according to section 10.5.1.4;
- mobile station classmark 2;
- ciphering key sequence number; and
- CM service type identifying the requested type of transaction (e.g. mobile originating call establishment, emergency call establishment, short message service, supplementary service activation).

A MS supporting eMLPP may optionally include a priority level in the CM SERVICE REQUEST message.

~~Only applicable for mobile stations supporting VGCS listening or VBS listening:~~
~~The NOTIFICATION RESPONSE message is used if a mobile station has received a notification message on the NCH for a VGCS or VBS call without a description of the respective VGCS or VBS channel. The mobile station therefore establishes an MM connection with a NOTIFICATION RESPONSE in order to obtain the necessary details from the network. The NOTIFICATION RESPONSE message contains the~~

- ~~mobile identity according to section 10.5.1.4;~~
- ~~mobile station classmark 2; and~~
- ~~notified voice group or broadcast call reference according to section 10.5.1.9.~~

A collision may occur when a CM layer message is received by the mobile station in MM sublayer state WAIT FOR OUTGOING MM CONNECTION or in WAIT FOR ADDITIONAL OUTGOING MM CONNECTION. In this case the MM sublayer in the MS shall establish a new MM connection for the incoming CM message as specified in 4.5.1.3.

Upon receiving a CM SERVICE REQUEST ~~or NOTIFICATION RESPONSE~~ message, the network shall analyse its content. The type of semantic analysis may depend on other on going MM connection(s). Depending on the type of request and the current status of the RR connection, the network may start any of the MM common procedures and RR procedures.

The network may initiate the classmark interrogation procedure, for example, to obtain further information on the mobile station's encryption capabilities.

The identification procedure (see section 4.3.3) may be invoked for instance if a TMSI provided by the mobile station is not recognized.

The network may invoke the authentication procedure (see section 4.3.2) depending on the CM service type.

The network decides also if the ciphering mode setting procedure shall be invoked (see section 3.4.7).

NOTE: If the CM_SERVICE_REQUEST message contains a priority level the network may use this to perform queuing and pre-emption as defined in GSM 03.67.

An indication from the RR sublayer that the ciphering mode setting procedure is completed, or reception of a CM SERVICE ACCEPT message, shall be treated as a service acceptance indication by the mobile station. The MM connection establishment is completed, timer T3230 shall be stopped, the CM entity that

requested the MM connection shall be informed, and MM sublayer state MM CONNECTION ACTIVE is entered. The MM connection is considered to be active.
If the service request cannot be accepted, the network returns a CM SERVICE REJECT message to the mobile station.
The reject cause information element (see 10.5.3.6 and Annex G) indicates the reason for rejection. The following cause values may apply:

#4 : IMSI unknown in VLR

#6 : Illegal ME

#17 : Network failure

#22 : Congestion

#32 : Service option not supported

#33 : Requested service option not subscribed

#34 : Service option temporarily out of order

If no other MM connection is active, the network may start the RR connection release (see section 3.5) when the CM SERVICE REJECT message is sent.
If a CM SERVICE REJECT message is received by the mobile station, timer T3230 shall be stopped, the requesting CM sublayer entity informed. Then the mobile station shall proceed as follows:

- If the cause value is not #4 or #6 the MM sublayer returns to the previous state (the state where the request was received). Other MM connections shall not be affected by the CM SERVICE REJECT message.

- If cause value #4 is received, the mobile station aborts any MM connection, deletes any TMSI, LAI and ciphering key sequence number in the SIM, changes the update status to NOT UPDATED (and stores it in the SIM according to section 4.1.2.2), and enters the MM sublayer state WAIT FOR NETWORK COMMAND. If subsequently the RR connection is released or aborted, this will force the mobile station to initiate a normal location updating). Whether the CM request shall be memorized during the location updating procedure, is a choice of implementation.

- If cause value #6 is received, the mobile station aborts any MM connection, deletes any TMSI, LAI and ciphering key sequence number in the SIM, changes the update status to ROAMING NOT ALLOWED (and stores it in the SIM according to section 4.1.2.2), and enters the MM sublayer state WAIT FOR NETWORK COMMAND. The mobile station shall consider the SIM as invalid until switch-off or the SIM is removed.

9.2 Messages for mobility management

Table 9.38/GSM 04.08 summarizes the messages for mobility management.

Table 9.2.1/GSM 04.08: Messages for mobility management

Registration messages:	Reference
IMSI DETACH INDICATION	9.2.12
LOCATION UPDATING ACCEPT	9.2.13
LOCATION UPDATING REJECT	9.2.14
LOCATION UPDATING REQUEST	9.2.15
Security messages:	**Reference**
AUTHENTICATION REJECT	9.2.1
AUTHENTICATION REQUEST	9.2.2
AUTHENTICATION RESPONSE	9.2.3
IDENTITY REQUEST	9.2.10
IDENTITY RESPONSE	9.2.11
TMSI REALLOCATION COMMAND	9.2.17
TMSI REALLOCATION COMPLETE	9.2.18
Connection management messages:	**Reference**
CM SERVICE ACCEPT	9.2.5
CM SERVICE REJECT	9.2.6
CM SERVICE ABORT	9.2.7
CM SERVICE REQUEST	9.2.9
CM RE-ESTABLISHMENT REQUEST	9.2.4
ABORT	9.2.8
~~NOTIFICATION RESPONSE~~	~~9.2.20~~
Miscellaneous message:	**Reference**
MM INFORMATION	9.2.15a
MM STATUS	9.2.16
MM NULL	9.2.19

9.2.20 Notification response

This message is sent by the mobile station to the network to respond on a notification for a voice group call or voice broadcast call. See table 9.54/GSM 04.08.

Message type: NOTIFICATION RESPONSE

Significance: dual

Direction: mobile station to network

IEI	Information element	Type / Reference	Presence	Format	Length
	Mobility management protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip Indicator	Skip Indicator 10.3.1	M	V	1/2
	Notification response message type	Message type 10.4	M	V	1
	Mobile station classmark	Mobile station classmark 2 10.5.1.6	M	LV	4
	Mobile identity	Mobile identity 10.5.1.4	M	LV	2-9
	Group or broadcast call reference	Call reference 10.5.1.9	M	V	1/2 4

Table 10.2/GSM 04.08: Message types for Mobility Management

8 7 6 5 4 3 2 1	
0 x 0 0 - - - -	Registration messages:
0 0 0 1	- IMSI DETACH INDICATION
0 0 1 0	- LOCATION UPDATING ACCEPT
0 1 0 0	- LOCATION UPDATING REJECT
1 0 0 0	- LOCATION UPDATING REQUEST
0 x 0 1 - - - -	Security messages:
0 0 0 1	- AUTHENTICATION REJECT
0 0 1 0	- AUTHENTICATION REQUEST
0 1 0 0	- AUTHENTICATION RESPONSE
1 0 0 0	- IDENTITY REQUEST
1 0 0 1	- IDENTITY RESPONSE
1 0 1 0	- TMSI REALLOCATION COMMAND
1 0 1 1	- TMSI REALLOCATION COMPLETE
0 x 1 0 - - - -	Connection management messages:
0 0 0 1	- CM SERVICE ACCEPT
0 0 1 0	- CM SERVICE REJECT
0 0 1 1	- CM SERVICE ABORT
0 1 0 0	- CM SERVICE REQUEST
0 1 0 1	- CM SERVICE PROMPT
0 1 1 0	- ~~NOTIFICATION RESPONSE~~ Reserved (see NOTE)
1 0 0 0	- CM RE-ESTABLISHMENT REQUEST
1 0 0 1	- ABORT
0 x 1 1 - - - -	Miscellaneous messages:
0 0 0 0	- MM NULL
0 0 0 1	- MM STATUS
0 0 1 0	- MM INFORMATION

NOTE: This value was allocated but never used in earlier phases of the protocol.

Bit 8 is reserved for possible future use as an extension bit, see GSM 04.07.
Bit 7 is reserved for the send sequence number in messages sent from the mobile station. In messages sent from the network, bit 7 is coded with a "0". See GSM 04.07.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

04.08	CR	A1011	Current Version:	6.7.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: CN#7 *list expected approval meeting # here ↑*	for approval	X	strategic		*(for SMG use only)*
	for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [X]

Source: ASCI rapporteurs / STF 139 / UIC / Nortel / Siemens / Kapsch / Sagem **Date:** 10.03.00

Subject: Moving NOTIFICATION RESPONSE from MM to GSM RR

Work item: ASCI

Category: *(only one category shall be marked with an X)*

F	Correction	
A	Corresponds to a correction in an earlier release	X
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	X
Release 98	
Release 99	
Release 00	

Reason for change: Up to now, the Notification Response procedure is defined in 04.08 as an MM procedure. It should be moved from MM to RR and then the procedure terminates at the BSS. This is motivated by the following reasons:

- the procedure would be quicker;
- the signaling load in the BSC and in the MSC would be decreased;
- this would not require the allocation of temporary resources (except on the radio interface).

Clauses affected: 4.5.1.1, 9.2, 9.2.20, 10.4

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs: CR 04.08-A1009, CR 04.08-A1013, CR 24.008-183, CR 04.08-A716, CR 04.08-A718, CR 04.08-A720
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

4.5.1.1 MM connection establishment initiated by the mobile station

Upon request of a CM entity to establish an MM connection the MM sublayer first decides whether to accept, delay, or reject this request:

- An MM connection establishment may only be initiated by the mobile station when the following conditions are fulfilled:

  - Its update status is UPDATED.

  - The MM sublayer is in one of the states MM IDLE or MM connection active but not in MM connection active (Group call).

  An exception from this general rule exists for emergency calls (see section 4.5.1.5). A further exception is defined in the following clause.

- If an MM specific procedure is running at the time the request from the CM sublayer is received, and the LOCATION UPDATING REQUEST message has been sent, the request will either be rejected or delayed, depending on implementation, until the MM specific procedure is finished and, provided that the network has not sent a "follow-on proceed" indication, the RR connection is released. If the LOCATION UPDATING REQUEST message has not been sent, the mobile station may include a "follow-on request" indicator in the message. The mobile station shall then delay the request until the MM specific procedure is completed, when it may be given the opportunity by the network to use the RR connection: see section 4.4.4.6.

In order to establish an MM connection, the mobile station proceeds as follows:

a) If no RR connection exists, the MM sublayer requests the RR sublayer to establish an RR connection and enters MM sublayer state WAIT FOR RR CONNECTION (MM CONNECTION). This request contains an establishment cause and a CM SERVICE REQUEST ~~or NOTIFICATION RESPONSE~~ message. When the establishment of an RR connection is indicated by the RR sublayer (this indication implies that the CM SERVICE REQUEST ~~or NOTIFICATION RESPONSE~~ message has been successfully transferred via the radio interface, see section 2.2), the MM sublayer of the mobile station starts timer T3230, gives an indication to the CM entity that requested the MM connection establishment, and enters MM sublayer state WAIT FOR OUTGOING MM CONNECTION.

b) If an RR connection is available, the MM sublayer of the mobile station sends a CM SERVICE REQUEST ~~or NOTIFICATION RESPONSE~~ message to the network, starts timer T3230, gives an indication to the CM entity that requested the MM connection establishment, and enters:

   - MM sublayer state WAIT FOR OUTGOING MM CONNECTION, if no MM connection is active;

   - MM sublayer state WAIT FOR ADDITIONAL OUTGOING MM CONNECTION, if at least one MM connection is active;

   - If an RR connection exists but the mobile station is in the state WAIT FOR NETWORK COMMAND then any requests from the CM layer that are received will either be rejected or delayed until this state is left.

c) Only applicable for mobile stations supporting VGCS talking:

If a mobile station which is in the MM sublayer state MM IDLE, service state RECEIVING GROUP CALL (NORMAL SERVICE), receives a request from the GCC sublayer to perform an uplink access, the MM sublayer requests the RR sublayer to perform an uplink access procedure and enters MM sublayer state WAIT FOR RR CONNECTION (GROUP TRANSMIT MODE).

When a successful uplink access is indicated by the RR sublayer, the MM sublayer of the mobile station gives an indication to the GCC sublayer and enters MM sublayer state MM CONNECTION ACTIVE (GROUP TRANSMIT MODE).

When an uplink access reject is indicated by the RR sublayer, the MM sublayer of the mobile station gives an indication to the GCC sublayer and enters the MM sublayer state MM IDLE, service state RECEIVING GROUP CALL (NORMAL SERVICE).

In the network, if an uplink access procedure is performed, the RR sublayer in the network provides an indication to the MM sublayer together with the mobile subscriber identity received in the TALKER INDICATION message. The network shall then enter the MM sublayer state MM CONNECTION ACTIVE (GROUP TRANSMIT MODE).

The CM SERVICE REQUEST message contains the

- mobile identity according to section 10.5.1.4;
- mobile station classmark 2;
- ciphering key sequence number; and
- CM service type identifying the requested type of transaction (e.g. mobile originating call establishment, emergency call establishment, short message service, supplementary service activation).

A MS supporting eMLPP may optionally include a priority level in the CM SERVICE REQUEST message.

~~Only applicable for mobile stations supporting VGCS listening or VBS listening:~~
~~The NOTIFICATION RESPONSE message is used if a mobile station has received a notification message on the NCH for a VGCS or VBS call without a description of the respective VGCS or VBS channel. The mobile station therefore establishes an MM connection with a NOTIFICATION RESPONSE in order to obtain the necessary details from the network. The NOTIFICATION RESPONSE message contains the~~

- ~~mobile identity according to section 10.5.1.4;~~
- ~~mobile station classmark 2; and~~
- ~~notified voice group or broadcast call reference according to section 10.5.1.9.~~

A collision may occur when a CM layer message is received by the mobile station in MM sublayer state WAIT FOR OUTGOING MM CONNECTION or in WAIT FOR ADDITIONAL OUTGOING MM CONNECTION. In this case the MM sublayer in the MS shall establish a new MM connection for the incoming CM message as specified in 4.5.1.3.

Upon receiving a CM SERVICE REQUEST ~~or NOTIFICATION RESPONSE~~ message, the network shall analyse its content. The type of semantic analysis may depend on other on going MM connection(s). Depending on the type of request and the current status of the RR connection, the network may start any of the MM common procedures and RR procedures.

The network may initiate the classmark interrogation procedure, for example, to obtain further information on the mobile station's encryption capabilities.

The identification procedure (see section 4.3.3) may be invoked for instance if a TMSI provided by the mobile station is not recognized.

The network may invoke the authentication procedure (see section 4.3.2) depending on the CM service type.

The network decides also if the ciphering mode setting procedure shall be invoked (see section 3.4.7).

NOTE: If the CM_SERVICE_REQUEST message contains a priority level the network may use this to perform queuing and pre-emption as defined in GSM 03.67.

An indication from the RR sublayer that the ciphering mode setting procedure is completed, or reception of a CM SERVICE ACCEPT message, shall be treated as a service acceptance indication by the mobile station. The MM connection establishment is completed, timer T3230 shall be stopped, the CM entity that

requested the MM connection shall be informed, and MM sublayer state MM CONNECTION ACTIVE is entered. The MM connection is considered to be active.
If the service request cannot be accepted, the network returns a CM SERVICE REJECT message to the mobile station.
The reject cause information element (see 10.5.3.6 and Annex G) indicates the reason for rejection. The following cause values may apply:

#4 : IMSI unknown in VLR

#6 : Illegal ME

#17 : Network failure

#22 : Congestion

#32 : Service option not supported

#33 : Requested service option not subscribed

#34 : Service option temporarily out of order

If no other MM connection is active, the network may start the RR connection release (see section 3.5) when the CM SERVICE REJECT message is sent.
If a CM SERVICE REJECT message is received by the mobile station, timer T3230 shall be stopped, the requesting CM sublayer entity informed. Then the mobile station shall proceed as follows:

- If the cause value is not #4 or #6 the MM sublayer returns to the previous state (the state where the request was received). Other MM connections shall not be affected by the CM SERVICE REJECT message.

- If cause value #4 is received, the mobile station aborts any MM connection, deletes any TMSI, LAI and ciphering key sequence number in the SIM, changes the update status to NOT UPDATED (and stores it in the SIM according to section 4.1.2.2), and enters the MM sublayer state WAIT FOR NETWORK COMMAND. If subsequently the RR connection is released or aborted, this will force the mobile station to initiate a normal location updating). Whether the CM request shall be memorized during the location updating procedure, is a choice of implementation.

- If cause value #6 is received, the mobile station aborts any MM connection, deletes any TMSI, LAI and ciphering key sequence number in the SIM, changes the update status to ROAMING NOT ALLOWED (and stores it in the SIM according to section 4.1.2.2), and enters the MM sublayer state WAIT FOR NETWORK COMMAND. The mobile station shall consider the SIM as invalid until switch-off or the SIM is removed.

9.2 Messages for mobility management

Table 9.2.1/GSM 04.08 summarizes the messages for mobility management.

Table 9.2.1/GSM 04.08: Messages for mobility management

Registration messages:	**Reference**
IMSI DETACH INDICATION	9.2.12
LOCATION UPDATING ACCEPT	9.2.13
LOCATION UPDATING REJECT	9.2.14
LOCATION UPDATING REQUEST	9.2.15
Security messages:	**Reference**
AUTHENTICATION REJECT	9.2.1
AUTHENTICATION REQUEST	9.2.2
AUTHENTICATION RESPONSE	9.2.3
IDENTITY REQUEST	9.2.10
IDENTITY RESPONSE	9.2.11
TMSI REALLOCATION COMMAND	9.2.17
TMSI REALLOCATION COMPLETE	9.2.18
Connection management messages:	**Reference**
CM SERVICE ACCEPT	9.2.5
CM SERVICE REJECT	9.2.6
CM SERVICE ABORT	9.2.7
CM SERVICE REQUEST	9.2.9
CM RE-ESTABLISHMENT REQUEST	9.2.4
ABORT	9.2.8
~~NOTIFICATION RESPONSE~~	~~9.2.20~~
Miscellaneous message:	**Reference**
MM INFORMATION	9.2.15a
MM STATUS	9.2.16
MM NULL	9.2.19

9.2.20 Notification response

This message is sent by the mobile station to the network to respond on a notification for a voice group call or voice broadcast call. See table 9.2.23/GSM 04.08.

Message type:NOTIFICATION RESPONSE

Significance: dual

Direction: mobile station to network

Table 9.2.23/GSM 04.08: NOTIFICATION RESPONSE message content

IEI	Information element	Type / Reference	Presence	Format	Length
	Mobility management protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip Indicator	Skip Indicator 10.3.1	M	V	1/2
	Notification response message type	Message type 10.4	M	V	1
	Mobile station classmark	Mobile station classmark 2 10.5.1.6	M	LV	4
	Mobile identity	Mobile identity 10.5.1.4	M	LV	2-9
	Group or broadcast call reference	Call reference 10.5.1.9	M	V	5

Table 10.2/GSM 04.08: Message types for Mobility Management

8 7 6 5 4 3 2 1	
0 x 0 0 - - - -	Registration messages:
0 0 0 1	- IMSI DETACH INDICATION
0 0 1 0	- LOCATION UPDATING ACCEPT
0 1 0 0	- LOCATION UPDATING REJECT
1 0 0 0	- LOCATION UPDATING REQUEST
0 x 0 1 - - - -	Security messages:
0 0 0 1	- AUTHENTICATION REJECT
0 0 1 0	- AUTHENTICATION REQUEST
0 1 0 0	- AUTHENTICATION RESPONSE
1 0 0 0	- IDENTITY REQUEST
1 0 0 1	- IDENTITY RESPONSE
1 0 1 0	- TMSI REALLOCATION COMMAND
1 0 1 1	- TMSI REALLOCATION COMPLETE
0 x 1 0 - - - -	Connection management messages:
0 0 0 1	- CM SERVICE ACCEPT
0 0 1 0	- CM SERVICE REJECT
0 0 1 1	- CM SERVICE ABORT
0 1 0 0	- CM SERVICE REQUEST
0 1 0 1	- CM SERVICE PROMPT
0 1 1 0	- ~~NOTIFICATION RESPONSE~~ Reserved (see NOTE)
1 0 0 0	- CM RE-ESTABLISHMENT REQUEST
1 0 0 1	- ABORT
0 x 1 1 - - - -	Miscellaneous messages:
0 0 0 0	- MM NULL
0 0 0 1	- MM STATUS
0 0 1 0	- MM INFORMATION

NOTE: This value was allocated but never used in earlier phases of the protocol.

Bit 8 is reserved for possible future use as an extension bit, see GSM 04.07.
Bit 7 is reserved for the send sequence number in messages sent from the mobile station. In messages sent from the network, bit 7 is coded with a "0". See GSM 04.07.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

04.08	CR	A1013	Current Version:	7.4.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: CN#7 *list expected approval meeting # here ↑*	for approval	X	strategic		*(for SMG use only)*
	for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [X]

Source: ASCI rapporteurs / STF 139 / UIC / Nortel / Siemens / Kapsch / Sagem **Date:** 10.03.00

Subject: Moving NOTIFICATION RESPONSE from MM to GSM RR

Work item: ASCI

Category: *(only one category shall be marked with an X)*

F	Correction	
A	Corresponds to a correction in an earlier release	X
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	X
Release 99	
Release 00	

Reason for change: Up to now, the Notification Response procedure is defined in 04.08 as an MM procedure. It should be moved from MM to RR and then the procedure terminates at the BSS. This is motivated by the following reasons:

- the procedure would be quicker;
- the signaling load in the BSC and in the MSC would be decreased;
- this would not require the allocation of temporary resources (except on the radio interface).

Clauses affected: 4.5.1.1, 9.2, 9.2.20, 10.4

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs: CR 04.08-A1009, CR 04.08-A1011, CR 24.008-183, CR 04.08-A716, CR 04.08-A718, CR 04.08-A720
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

4.5.1.1 MM connection establishment initiated by the mobile station

Upon request of a CM entity to establish an MM connection the MM sublayer first decides whether to accept, delay, or reject this request:

- An MM connection establishment may only be initiated by the mobile station when the following conditions are fulfilled:

  - Its update status is UPDATED.

  - The MM sublayer is in one of the states MM IDLE or MM connection active but not in MM connection active (Group call).

  An exception from this general rule exists for emergency calls (see section 4.5.1.5). A further exception is defined in the following clause.

- If an MM specific procedure is running at the time the request from the CM sublayer is received, and the LOCATION UPDATING REQUEST message has been sent, the request will either be rejected or delayed, depending on implementation, until the MM specific procedure is finished and, provided that the network has not sent a "follow-on proceed" indication, the RR connection is released. If the LOCATION UPDATING REQUEST message has not been sent, the mobile station may include a "follow-on request" indicator in the message. The mobile station shall then delay the request until the MM specific procedure is completed, when it may be given the opportunity by the network to use the RR connection: see section 4.4.4.6.

In order to establish an MM connection, the mobile station proceeds as follows:

a) If no RR connection exists, the MM sublayer requests the RR sublayer to establish an RR connection and enters MM sublayer state WAIT FOR RR CONNECTION (MM CONNECTION). This request contains an establishment cause and a CM SERVICE REQUEST ~~or NOTIFICATION RESPONSE~~ message. When the establishment of an RR connection is indicated by the RR sublayer (this indication implies that the CM SERVICE REQUEST ~~or NOTIFICATION RESPONSE~~ message has been successfully transferred via the radio interface, see section 2.2), the MM sublayer of the mobile station starts timer T3230, gives an indication to the CM entity that requested the MM connection establishment, and enters MM sublayer state WAIT FOR OUTGOING MM CONNECTION.

b) If an RR connection is available, the MM sublayer of the mobile station sends a CM SERVICE REQUEST ~~or NOTIFICATION RESPONSE~~ message to the network, starts timer T3230, gives an indication to the CM entity that requested the MM connection establishment, and enters:

   - MM sublayer state WAIT FOR OUTGOING MM CONNECTION, if no MM connection is active;

   - MM sublayer state WAIT FOR ADDITIONAL OUTGOING MM CONNECTION, if at least one MM connection is active;

   - If an RR connection exists but the mobile station is in the state WAIT FOR NETWORK COMMAND then any requests from the CM layer that are received will either be rejected or delayed until this state is left.

c) Only applicable for mobile stations supporting VGCS talking:

If a mobile station which is in the MM sublayer state MM IDLE, service state RECEIVING GROUP CALL (NORMAL SERVICE), receives a request from the GCC sublayer to perform an uplink access, the MM sublayer requests the RR sublayer to perform an uplink access procedure and enters MM sublayer state WAIT FOR RR CONNECTION (GROUP TRANSMIT MODE).

When a successful uplink access is indicated by the RR sublayer, the MM sublayer of the mobile station gives an indication to the GCC sublayer and enters MM sublayer state MM CONNECTION ACTIVE (GROUP TRANSMIT MODE).

When an uplink access reject is indicated by the RR sublayer, the MM sublayer of the mobile station gives an indication to the GCC sublayer and enters the MM sublayer state MM IDLE, service state RECEIVING GROUP CALL (NORMAL SERVICE).

In the network, if an uplink access procedure is performed, the RR sublayer in the network provides an indication to the MM sublayer together with the mobile subscriber identity received in the TALKER INDICATION message. The network shall then enter the MM sublayer state MM CONNECTION ACTIVE (GROUP TRANSMIT MODE).

The CM SERVICE REQUEST message contains the

- mobile identity according to section 10.5.1.4;
- mobile station classmark 2;
- ciphering key sequence number; and
- CM service type identifying the requested type of transaction (e.g. mobile originating call establishment, emergency call establishment, short message service, supplementary service activation), location services)

A MS supporting eMLPP may optionally include a priority level in the CM SERVICE REQUEST message.

~~Only applicable for mobile stations supporting VGCS listening or VBS listening:~~
~~The NOTIFICATION RESPONSE message is used if a mobile station has received a notification message on the NCH for a VGCS or VBS call without a description of the respective VGCS or VBS channel. The mobile station therefore establishes an MM connection with a NOTIFICATION RESPONSE in order to obtain the necessary details from the network. The NOTIFICATION RESPONSE message contains the~~

- ~~mobile identity according to section 10.5.1.4;~~
- ~~mobile station classmark 2; and~~
- ~~notified voice group or broadcast call reference according to section 10.5.1.9.~~

A collision may occur when a CM layer message is received by the mobile station in MM sublayer state WAIT FOR OUTGOING MM CONNECTION or in WAIT FOR ADDITIONAL OUTGOING MM CONNECTION. In this case the MM sublayer in the MS shall establish a new MM connection for the incoming CM message as specified in 4.5.1.3.

Upon receiving a CM SERVICE REQUEST ~~or NOTIFICATION RESPONSE~~ message, the network shall analyse its content. The type of semantic analysis may depend on other on going MM connection(s). Depending on the type of request and the current status of the RR connection, the network may start any of the MM common procedures and RR procedures.

The network may initiate the classmark interrogation procedure, for example, to obtain further information on the mobile station's encryption capabilities.

The identification procedure (see section 4.3.3) may be invoked for instance if a TMSI provided by the mobile station is not recognized.

The network may invoke the authentication procedure (see section 4.3.2) depending on the CM service type.

The network decides also if the ciphering mode setting procedure shall be invoked (see section 3.4.7).

NOTE: If the CM_SERVICE_REQUEST message contains a priority level the network may use this to perform queuing and pre-emption as defined in GSM 03.67.

An indication from the RR sublayer that the ciphering mode setting procedure is completed, or reception of a CM SERVICE ACCEPT message, shall be treated as a service acceptance indication by the mobile station. The MM connection establishment is completed, timer T3230 shall be stopped, the CM entity that

requested the MM connection shall be informed, and MM sublayer state MM CONNECTION ACTIVE is entered. The MM connection is considered to be active.
If the service request cannot be accepted, the network returns a CM SERVICE REJECT message to the mobile station.
The reject cause information element (see 10.5.3.6 and Annex G) indicates the reason for rejection. The following cause values may apply:

#4 : IMSI unknown in VLR

#6 : Illegal ME

#17 : Network failure

#22 : Congestion

#32 : Service option not supported

#33 : Requested service option not subscribed

#34 : Service option temporarily out of order

If no other MM connection is active, the network may start the RR connection release (see section 3.5) when the CM SERVICE REJECT message is sent.
If a CM SERVICE REJECT message is received by the mobile station, timer T3230 shall be stopped, the requesting CM sublayer entity informed. Then the mobile station shall proceed as follows:

- If the cause value is not #4 or #6 the MM sublayer returns to the previous state (the state where the request was received). Other MM connections shall not be affected by the CM SERVICE REJECT message.

- If cause value #4 is received, the mobile station aborts any MM connection, deletes any TMSI, LAI and ciphering key sequence number in the SIM, changes the update status to NOT UPDATED (and stores it in the SIM according to section 4.1.2.2), and enters the MM sublayer state WAIT FOR NETWORK COMMAND. If subsequently the RR connection is released or aborted, this will force the mobile station to initiate a normal location updating). Whether the CM request shall be memorized during the location updating procedure, is a choice of implementation.

- If cause value #6 is received, the mobile station aborts any MM connection, deletes any TMSI, LAI and ciphering key sequence number in the SIM, changes the update status to ROAMING NOT ALLOWED (and stores it in the SIM according to section 4.1.2.2), and enters the MM sublayer state WAIT FOR NETWORK COMMAND. The mobile station shall consider the SIM as invalid until switch-off or the SIM is removed.

9.2 Messages for mobility management

Table 9.2.1/GSM 04.08 summarizes the messages for mobility management.

Table 9.2.1/GSM 04.08: Messages for mobility management

Registration messages:	**Reference**
IMSI DETACH INDICATION	9.2.12
LOCATION UPDATING ACCEPT	9.2.13
LOCATION UPDATING REJECT	9.2.14
LOCATION UPDATING REQUEST	9.2.15
Security messages:	**Reference**
AUTHENTICATION REJECT	9.2.1
AUTHENTICATION REQUEST	9.2.2
AUTHENTICATION RESPONSE	9.2.3
IDENTITY REQUEST	9.2.10
IDENTITY RESPONSE	9.2.11
TMSI REALLOCATION COMMAND	9.2.17
TMSI REALLOCATION COMPLETE	9.2.18
Connection management messages:	**Reference**
CM SERVICE ACCEPT	9.2.5
CM SERVICE REJECT	9.2.6
CM SERVICE ABORT	9.2.7
CM SERVICE REQUEST	9.2.9
CM RE-ESTABLISHMENT REQUEST	9.2.4
ABORT	9.2.8
~~NOTIFICATION RESPONSE~~	~~9.2.20~~
Miscellaneous message:	**Reference**
MM INFORMATION	9.2.15a
MM STATUS	9.2.16
MM NULL	9.2.19

9.2.20 Notification response

This message is sent by the mobile station to the network to respond on a notification for a voice group call or voice broadcast call. See table 9.2.23/GSM 04.08.

Message type:NOTIFICATION RESPONSE

Significance: dual

Direction: mobile station to network

Table 9.2.23/GSM 04.08: NOTIFICATION RESPONSE message content

IEI	Information element	Type / Reference	Presence	Format	Length
	Mobility management protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip Indicator	Skip Indicator 10.3.1	M	V	1/2
	Notification response message type	Message type 10.4	M	V	1
	Mobile station classmark	Mobile station classmark 2 10.5.1.6	M	LV	4
	Mobile identity	Mobile identity 10.5.1.4	M	LV	2-9
	Group or broadcast call reference	Call reference 10.5.1.9	M	V	5

Table 10.2/GSM 04.08: Message types for Mobility Management

8 7 6 5 4 3 2 1	
0 x 0 0 - - - -	Registration messages:
0 0 0 1	- IMSI DETACH INDICATION
0 0 1 0	- LOCATION UPDATING ACCEPT
0 1 0 0	- LOCATION UPDATING REJECT
1 0 0 0	- LOCATION UPDATING REQUEST
0 x 0 1 - - - -	Security messages:
0 0 0 1	- AUTHENTICATION REJECT
0 0 1 0	- AUTHENTICATION REQUEST
0 1 0 0	- AUTHENTICATION RESPONSE
1 0 0 0	- IDENTITY REQUEST
1 0 0 1	- IDENTITY RESPONSE
1 0 1 0	- TMSI REALLOCATION COMMAND
1 0 1 1	- TMSI REALLOCATION COMPLETE
0 x 1 0 - - - -	Connection management messages:
0 0 0 1	- CM SERVICE ACCEPT
0 0 1 0	- CM SERVICE REJECT
0 0 1 1	- CM SERVICE ABORT
0 1 0 0	- CM SERVICE REQUEST
0 1 0 1	- CM SERVICE PROMPT
0 1 1 0	- ~~NOTIFICATION RESPONSE~~ Reserved (see NOTE)
1 0 0 0	- CM RE-ESTABLISHMENT REQUEST
1 0 0 1	- ABORT
0 x 1 1 - - - -	Miscellaneous messages:
0 0 0 0	- MM NULL
0 0 0 1	- MM STATUS
0 0 1 0	- MM INFORMATION

NOTE: This value was allocated but never used in earlier phases of the protocol.

Bit 8 is reserved for possible future use as an extension bit, see GSM 04.07.
Bit 7 is reserved for the send sequence number in messages sent from the mobile station. In messages sent from the network, bit 7 is coded with a "0". See GSM 04.07.

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

24.008	CR	A183	Current Version:	3.2.1

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: CN#7 *list expected approval meeting # here ↑*	for approval	X	strategic		*(for SMG use only)*
	for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [ ] Core Network [X]

Source: ASCI rapporteurs / STF 139 / UIC / Nortel / Siemens / Kapsch / Sagem **Date:** 10.03.00

Subject: Moving NOTIFICATION RESPONSE from MM to GSM RR

Work item: ASCI

Category: *(only one category shall be marked with an X)*

F	Correction	
A	Corresponds to a correction in an earlier release	X
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change:

Up to now, the Notification Response procedure is defined in 04.08 as an MM procedure. It should be moved from MM to RR and then the procedure terminates at the BSS. This is motivated by the following reasons:

- the procedure would be quicker;
- the signaling load in the BSC and in the MSC would be decreased;
- this would not require the allocation of temporary resources (except on the radio interface).

Clauses affected: 4.5.1.1, 9.2, 9.2.20, 10.4

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs: CR 04.08-A1009, CR 04.08-A1011, CR 04.08-A1013, CR 04.08-A716, CR 04.08-A718, CR 04.08-A720
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

4.5.1.1 MM connection establishment initiated by the mobile station

Upon request of a CM entity to establish an MM connection the MM sublayer first decides whether to accept, delay, or reject this request:

- An MM connection establishment may only be initiated by the mobile station when the following conditions are fulfilled:

  - Its update status is UPDATED.

  - The MM sublayer is in one of the states MM IDLE or MM connection active but not in MM connection active (Group call).

  An exception from this general rule exists for emergency calls (see section 4.5.1.5). A further exception is defined in the following clause.

- If an MM specific procedure is running at the time the request from the CM sublayer is received, and the LOCATION UPDATING REQUEST message has been sent, the request will either be rejected or delayed, depending on implementation, until the MM specific procedure is finished and, provided that the network has not sent a "follow-on proceed" indication, the RR connection is released. If the LOCATION UPDATING REQUEST message has not been sent, the mobile station may include a "follow-on request" indicator in the message. The mobile station shall then delay the request until the MM specific procedure is completed, when it may be given the opportunity by the network to use the RR connection: see section 4.4.4.6.

In order to establish an MM connection, the mobile station proceeds as follows:

a) If no RR connection exists, the MM sublayer requests the RR sublayer to establish an RR connection and enters MM sublayer state WAIT FOR RR CONNECTION (MM CONNECTION). This request contains an establishment cause and a CM SERVICE REQUEST ~~or NOTIFICATION RESPONSE~~ message. When the establishment of an RR connection is indicated by the RR sublayer (this indication implies that the CM SERVICE REQUEST ~~or NOTIFICATION RESPONSE~~ message has been successfully transferred via the radio interface, see section 2.2), the MM sublayer of the mobile station starts timer T3230, gives an indication to the CM entity that requested the MM connection establishment, and enters MM sublayer state WAIT FOR OUTGOING MM CONNECTION.

b) If an RR connection is available, the MM sublayer of the mobile station sends a CM SERVICE REQUEST ~~or NOTIFICATION RESPONSE~~ message to the network, starts timer T3230, gives an indication to the CM entity that requested the MM connection establishment, and enters:

   - MM sublayer state WAIT FOR OUTGOING MM CONNECTION, if no MM connection is active;

   - MM sublayer state WAIT FOR ADDITIONAL OUTGOING MM CONNECTION, if at least one MM connection is active;

   - If an RR connection exists but the mobile station is in the state WAIT FOR NETWORK COMMAND then any requests from the CM layer that are received will either be rejected or delayed until this state is left.

c) Only applicable for mobile stations supporting VGCS talking:

If a mobile station which is in the MM sublayer state MM IDLE, service state RECEIVING GROUP CALL (NORMAL SERVICE), receives a request from the GCC sublayer to perform an uplink access, the MM sublayer requests the RR sublayer to perform an uplink access procedure and enters MM sublayer state WAIT FOR RR CONNECTION (GROUP TRANSMIT MODE).

When a successful uplink access is indicated by the RR sublayer, the MM sublayer of the mobile station gives an indication to the GCC sublayer and enters MM sublayer state MM CONNECTION ACTIVE (GROUP TRANSMIT MODE).

When an uplink access reject is indicated by the RR sublayer, the MM sublayer of the mobile station gives an indication to the GCC sublayer and enters the MM sublayer state MM IDLE, service state RECEIVING GROUP CALL (NORMAL SERVICE).

In the network, if an uplink access procedure is performed, the RR sublayer in the network provides an indication to the MM sublayer together with the mobile subscriber identity received in the TALKER INDICATION message. The network shall then enter the MM sublayer state MM CONNECTION ACTIVE (GROUP TRANSMIT MODE).

The CM SERVICE REQUEST message contains the

- mobile identity according to section 10.5.1.4;
- mobile station classmark 2;
- ciphering key sequence number; and
- CM service type identifying the requested type of transaction (e.g. mobile originating call establishment, emergency call establishment, short message service, supplementary service activation), location services)

A MS supporting eMLPP may optionally include a priority level in the CM SERVICE REQUEST message.

~~Only applicable for mobile stations supporting VGCS listening or VBS listening:~~
~~The NOTIFICATION RESPONSE message is used if a mobile station has received a notification message on the NCH for a VGCS or VBS call without a description of the respective VGCS or VBS channel. The mobile station therefore establishes an MM connection with a NOTIFICATION RESPONSE in order to obtain the necessary details from the network. The NOTIFICATION RESPONSE message contains the~~

- ~~mobile identity according to section 10.5.1.4;~~
- ~~mobile station classmark 2; and~~
- ~~notified voice group or broadcast call reference according to section 10.5.1.9.~~

A collision may occur when a CM layer message is received by the mobile station in MM sublayer state WAIT FOR OUTGOING MM CONNECTION or in WAIT FOR ADDITIONAL OUTGOING MM CONNECTION. In this case the MM sublayer in the MS shall establish a new MM connection for the incoming CM message as specified in 4.5.1.3.

Upon receiving a CM SERVICE REQUEST ~~or NOTIFICATION RESPONSE~~ message, the network shall analyse its content. The type of semantic analysis may depend on other on going MM connection(s). Depending on the type of request and the current status of the RR connection, the network may start any of the MM common procedures and RR procedures.

In GSM, the network may initiate the classmark interrogation procedure, for example, to obtain further information on the mobile station's encryption capabilities.

The identification procedure (see section 4.3.3) may be invoked for instance if a TMSI provided by the mobile station is not recognized.

The network may invoke the authentication procedure (see section 4.3.2) depending on the CM service type.

In GSM, the network decides also if the security mode setting procedure shall be invoked (see section 3.4.7 in GSM 04.18)..

In UMTS, the network decides also if the security mode control procedure shall be invoked (see section 8.1.10 in TS 25.331).

NOTE: If the CM_SERVICE_REQUEST message contains a priority level the network may use this to perform queuing and pre-emption as defined in TS 23.067.

In GSM, an indication from the RR sublayer that the security mode setting procedure is completed, or reception of a CM SERVICE ACCEPT message, shall be treated as a service acceptance indication by the mobile station.
The MM connection establishment is completed, timer T3230 shall be stopped, the CM entity that requested the MM connection shall be informed, and MM sublayer state MM CONNECTION ACTIVE is entered. The MM connection is considered to be active.
If the service request cannot be accepted, the network returns a CM SERVICE REJECT message to the mobile station.
The reject cause information element (see 10.5.3.6 and Annex G) indicates the reason for rejection. The following cause values may apply:

#4 : IMSI unknown in VLR

#6 : Illegal ME

#17 : Network failure

#22 : Congestion

#32 : Service option not supported

#33 : Requested service option not subscribed

#34 : Service option temporarily out of order

If no other MM connection is active, the network may start the RR connection release (see section 3.5) when the CM SERVICE REJECT message is sent.
If a CM SERVICE REJECT message is received by the mobile station, timer T3230 shall be stopped, the requesting CM sublayer entity informed. Then the mobile station shall proceed as follows:

- If the cause value is not #4 or #6 the MM sublayer returns to the previous state (the state where the request was received). Other MM connections shall not be affected by the CM SERVICE REJECT message.

- If cause value #4 is received, the mobile station aborts any MM connection, deletes any TMSI, LAI and ciphering key sequence number in the SIM, changes the update status to NOT UPDATED (and stores it in the SIM according to section 4.1.2.2), and enters the MM sublayer state WAIT FOR NETWORK COMMAND. If subsequently the RR connection is released or aborted, this will force the mobile station to initiate a normal location updating). Whether the CM request shall be memorized during the location updating procedure, is a choice of implementation.

- If cause value #6 is received, the mobile station aborts any MM connection, deletes any TMSI, LAI and ciphering key sequence number in the SIM, changes the update status to ROAMING NOT ALLOWED (and stores it in the SIM according to section 4.1.2.2), and enters the MM sublayer state WAIT FOR NETWORK COMMAND. The mobile station shall consider the SIM as invalid until switch-off or the SIM is removed.

9.2 Messages for mobility management

Table 9.2.1/GSM 04.08 summarizes the messages for mobility management.

Table 9.2.1/TS 24.008:: Messages for mobility management

Registration messages:	**Reference**
IMSI DETACH INDICATION	9.2.12
LOCATION UPDATING ACCEPT	9.2.13
LOCATION UPDATING REJECT	9.2.14
LOCATION UPDATING REQUEST	9.2.15
Security messages:	**Reference**
AUTHENTICATION REJECT	9.2.1
AUTHENTICATION REQUEST	9.2.2
AUTHENTICATION RESPONSE	9.2.3
IDENTITY REQUEST	9.2.10
IDENTITY RESPONSE	9.2.11
TMSI REALLOCATION COMMAND	9.2.17
TMSI REALLOCATION COMPLETE	9.2.18
Connection management messages:	**Reference**
CM SERVICE ACCEPT	9.2.5
CM SERVICE REJECT	9.2.6
CM SERVICE ABORT	9.2.7
CM SERVICE REQUEST	9.2.9
CM RE-ESTABLISHMENT REQUEST	9.2.4
ABORT	9.2.8
~~NOTIFICATION RESPONSE~~	~~9.2.20~~
Miscellaneous message:	**Reference**
MM INFORMATION	9.2.15a
MM STATUS	9.2.16
MM NULL	9.2.19

9.2.20 Notification response

This message is sent by the mobile station to the network to respond on a notification for a voice group call or voice broadcast call. See table 9.2.23/TS 24.008.

Message type: NOTIFICATION RESPONSE

Significance: dual

Direction: mobile station to network

Table 9.2.23/TS 24.008: NOTIFICATION RESPONSE message content

IEI	Information element	Type / Reference	Presence	Format	Length
	Mobility management protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip Indicator	Skip Indicator 10.3.1	M	V	1/2
	Notification response message type	Message type 10.4	M	V	1
	Mobile station classmark	Mobile station classmark 2 10.5.1.6	M	LV	4
	Mobile identity	Mobile identity 10.5.1.4	M	LV	2-9
	Group or broadcast call reference	Call reference 10.5.1.9	M	V	5

Table 10.2/TS 24.008: Message types for Mobility Management

8 7 6 5 4 3 2 1	
x x 0 0 - - - -	Registration messages:
0 0 0 1	- IMSI DETACH INDICATION
0 0 1 0	- LOCATION UPDATING ACCEPT
0 1 0 0	- LOCATION UPDATING REJECT
1 0 0 0	- LOCATION UPDATING REQUEST
x x 0 1 - - - -	Security messages:
0 0 0 1	- AUTHENTICATION REJECT
0 0 1 0	- AUTHENTICATION REQUEST
0 1 0 0	- AUTHENTICATION RESPONSE
1 1 0 0	- CS AUTHENTICATION FAILURE……
1 0 0 0	- IDENTITY REQUEST
1 0 0 1	- IDENTITY RESPONSE
1 0 1 0	- TMSI REALLOCATION COMMAND
1 0 1 1	- TMSI REALLOCATION COMPLETE
x x 1 0 - - - -	Connection management messages:
0 0 0 1	- CM SERVICE ACCEPT
0 0 1 0	- CM SERVICE REJECT
0 0 1 1	- CM SERVICE ABORT
0 1 0 0	- CM SERVICE REQUEST
0 1 0 1	- CM SERVICE PROMPT
0 1 1 0	- ~~NOTIFICATION RESPONSE~~ Reserved (see NOTE)
1 0 0 0	- CM RE-ESTABLISHMENT REQUEST
1 0 0 1	- ABORT
x x 1 1 - - - -	Miscellaneous messages:
0 0 0 0	- MM NULL
0 0 0 1	- MM STATUS
0 0 1 0	- MM INFORMATION

NOTE: This value was allocated but never used in earlier phases of the protocol.

When the radio connection started with a core network node of earlier than R99, bit 8 shall be set to 0 and bit 7 is reserved for the send sequence number in messages sent from the mobile station. In messages sent from the network, bits 7 and 8 are coded with a "0". See TS 24.007.
When the radio connection started with a core network node of R’99 or later, bits 7 and 8 are reserved for the send sequence number in messages sent from the mobile station. In messages sent from the network, bits 7 and 8 are coded with a "0". See TS 24.007.

Draft CHANGE REQUEST No :	**A716**	*Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.*
Technical Specification GSM	04.08	Version: 5.14.0

Submitted to SMG 31bis *list SMG plenary meeting no. here ↑*

for approval [ ] for information [ ]

without presentation ("non-strategic") [ ] with presentation ("strategic") [ ]

PT SMG CR cover form is available from: http://docbox.etsi.org/tech-org/smg/Document/smg/tools/CR_form/crf28_1.zip

Proposed change affects: *(at least one should be marked with an X)* SIM [ ] ME [X] Network [X]

Work item: ASCI

Source: ASCI rapporteurs, STF 139, Nortel, Siemens, Sagem, Kapsch

Date: 10.03.00

Subject: Moving NOTIFICATION RESPONS from MM to RR

Category: *(one category and one release only shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	X
Release 97	
Release 98	
Release 99	

Reason for change:

Up to now, the Notification Response procedure is defined in the 04.08 as a MM procedure. It is proposed to move it from MM to RR. This is motivated by the following reasons:

- the procedure would be quicker;
- the signalling load in the BSC and in the MSC would be decreased;
- this would not require the allocation of temporary resources (except on the radio interface).

Clauses affected: 3.3.1.1, 3.3.1.1.2, 3.3.3.2, new section 3.3.3.4, 9.1, 9.1.53, 10.4

Other specs Affected:

Other releases of same spec	[ ] → List of CRs:	04.08-A718 (R97), 04.08-A720 (R98) as mirror CRs; 04.08-A1109, 04.08-A1111, 04.08-A1113 for MM part
Other core specifications	[ ] → List of CRs:	04.18-A080 as mirror CR for R99; 08.08-Axxx
MS test specifications / TBRs	[ ] → List of CRs:	11.10-Axxx
BSS test specifications	[ ] → List of CRs:	
O&M specifications	[ ] → List of CRs:	

Other comments:

3.3.1.1 Entering the dedicated mode : immediate assignment procedure

The immediate assignment procedure can only be initiated by the RR entity of the mobile station. Initiation is triggered by request from the MM sublayer to enter the dedicated mode or by the RR entity in response to a PAGING REQUEST message or to initiate a notification response procedure. Upon such a request,

- if access to the network is allowed (as defined in 3.3.1.1.1), the RR entity of the mobile station initiates the immediate assignment procedure as defined in section 3.3.1.1.2;
- otherwise, it rejects the request.

The request from the MM sublayer to establish an RR connection specifies an establishment cause. Similarly, the request from the RR entity to establish a RR connection in response to a PAGING REQUEST 1, 2 or 3 message specifies one of the establishment causes "answer to paging"; the request from the RR entity to establish an RR connection in order to initiate a notification response procedure specifies one of the establishment causes " procedures that can be completed with a SDCCH".

3.3.1.1.1 Permission to access the network

All mobile stations with an inserted SIM are members of one out of 10 access classes numbered 0 to 9. The access class number is stored in the SIM. In addition, mobile stations may be members of one or more out of 5 special access classes (access classes 11 to 15) (see GSM 02.11), this is also held on the SIM card.

The system information messages on the BCCH broadcast the list of authorized access classes and authorized special access classes in the system information messages, and whether emergency calls are allowed in the cell to all mobile stations or only to the members of authorized special access classes.

If the establishment cause for the request of the MM sublayer is not "emergency call", access to the network is allowed if and only if the mobile station is a member of at least one authorized:

- access class; or
- special access class.

If the establishment cause for the request of the MM sublayer is "emergency call", access to the network is allowed if and only if:

- emergency calls are allowed to all mobile stations in the cell; or
- the mobile station is a member of at least one authorized special access class.

3.3.1.1.2 Initiation of the immediate assignment procedure

The RR entity of the mobile station initiates the immediate assignment procedure by scheduling the sending on the RACH and leaving idle mode (in particular, the mobile station shall ignore PAGING REQUEST messages).

It then sends maximally M + 1 CHANNEL REQUEST messages on the RACH in a way such that:

- the number of slots belonging to the mobile station's RACH between initiation of the immediate assignment procedure and the first CHANNEL REQUEST message (excluding the slot containing

the message itself) is a random value drawn randomly for each new initial assignment initiation with uniform probability distribution in the set {0, 1, ..., max (T,8) - 1};

- the number of slots belonging to the mobile station's RACH between two successive CHANNEL REQUEST messages (excluding the slots containing the messages themselves) is a random value drawn randomly for each new transmission with uniform probability distribution in the set {S, S + 1, ..., S + T - 1};

Here, T is the value of the parameter "Tx-integer" broadcast on the BCCH;

M is the value of the parameter "max retrans" broadcast on the BCCH;

S is a parameter depending on the CCCH configuration and on the value of Tx-integer as defined in table 3.1/GSM 04.08.

The CHANNEL REQUEST messages are sent on the RACH (cf. section 1.5) and contain as parameters:

- an establishment cause which corresponds to the establishment cause given by the MM sublayer and the broadcast NECI value, or which corresponds to one of the establishment causes "answer to paging" given by the RR entity in response to a PAGING REQUEST message including the Channel Needed information, or which corresponds to one of the establishment causes " procedures that can be completed with a SDCCH" given by the RR entity in order to initiate a notification response procedure;

- a random reference which is drawn randomly from a uniform probability distribution for every new transmission.

After sending the first CHANNEL REQUEST message, the mobile station shall start listening to the BCCH; it shall also listen to the full downlink CCCH timeslot corresponding to its CCCH group.

Having sent M + 1 CHANNEL REQUEST messages, the RR entity of the mobile station starts timer T3126. At expiry of timer T3126, the immediate assignment procedure is aborted; if the immediate assignment procedure was triggered by a request from the MM sublayer, a random access failure is indicated to the MM sublayer.

Table 3.1/GSM 04.08: Values of parameter S

TX-integer	non combined CCCH	combined CCH/SDCCH
3,8,14,50	55	41
4,9,16	76	52
5,10,20	109	58
6,11,25	163	86
7,12,32	217	115

3.3.3.2 Joining a VGCS or VBS call

In order to join a VGCS or a VBS call the following procedures apply.

In this subclause, the term **notification** refers to the notification which has triggered the decision to join a VGCS or VBS call.

If the notification on the main DCCH concerns a VBS or VGCS in the current cell and does not contain a description of the VGCS or VBS channel, the mobile station shall read the corresponding notification on the NCH.

If the description of the VGCS or VBS channel was included in the notification for the current cell, RR connection establishment shall not be initiated, instead, the mobile station shall enter the group receive mode.

If no description for the VGCS or VBS channel is included in the notification, the mobile station shall establish an RR connection in dedicated mode in order to ~~respond to~~ initiate the notification response procedure.

3.3.3.4 Notification response procedure

In order to initiate the notification response procedure, if access to the network is allowed, the mobile station shall, when camped on a cell as specified in GSM 03.22, initiate the immediate assignment procedure as specified in 3.3.1. The establishment of the main signalling link is then initiated by use of an SABM with information field containing the NOTIFICATION RESPONSE message (see section 3.1.5). The MM sublayer in the mobile station is informed that the RR entity has entered the dedicated mode.

Upon receipt of the PAGING RESPONSE message the network stops timer T3113. The MM sublayer in the network may be informed that an RR connection exists; in this case, the MM sublayer may initiate MM common procedures.

The network may use the dedicated connection to order the mobile station to enter the group receive mode.

9.1 Messages for Radio Resources management

Table 9.1/GSM 04.08 summarizes the messages for Radio Resources management.

Table 9.1/GSM 04.08: Messages for Radio Resources management

Channel establishment messages:	Reference
ADDITIONAL ASSIGNMENT	9.1.1
IMMEDIATE ASSIGNMENT	9.1.18
IMMEDIATE ASSIGNMENT EXTENDED	9.1.19
IMMEDIATE ASSIGNMENT REJECT	9.1.20
Ciphering messages:	Reference
CIPHERING MODE COMMAND	9.1.9
CIPHERING MODE COMPLETE	9.1.10
Handover messages:	Reference
ASSIGNMENT COMMAND	9.1.2
ASSIGNMENT COMPLETE	9.1.3
ASSIGNMENT FAILURE	9.1.4
HANDOVER ACCESS	9.1.14
HANDOVER COMMAND	9.1.15
HANDOVER COMPLETE	9.1.16
HANDOVER FAILURE	9.1.17
PHYSICAL INFORMATION	9.1.28
Channel release messages:	Reference
CHANNEL RELEASE	9.1.7
PARTIAL RELEASE	9.1.26
PARTIAL RELEASE COMPLETE	9.1.27
Paging messages:	Reference
PAGING REQUEST TYPE 1	9.1.22
PAGING REQUEST TYPE 2	9.1.23
PAGING REQUEST TYPE 3	9.1.24
PAGING RESPONSE	9.1.25

(continued...)

Table 9.1/GSM 04.08: Messages for Radio Resources management (continued)

System information messages:	Reference
SYSTEM INFORMATION TYPE 1	9.1.31
SYSTEM INFORMATION TYPE 2	9.1.32
SYSTEM INFORMATION TYPE 2bis	9.1.33
SYSTEM INFORMATION TYPE 2ter	9.1.34
SYSTEM INFORMATION TYPE 3	9.1.35
SYSTEM INFORMATION TYPE 4	9.1.36
SYSTEM INFORMATION TYPE 5	9.1.37
SYSTEM INFORMATION TYPE 5bis	9.1.38
SYSTEM INFORMATION TYPE 5ter	9.1.39
SYSTEM INFORMATION TYPE 6	9.1.40
SYSTEM INFORMATION TYPE 7	9.1.41
SYSTEM INFORMATION TYPE 8	9.1.42
SYSTEM INFORMATION TYPE 9	9.1.43
Specific messages for VBS/VGCS:	Reference
NOTIFICATION/FACCH	9.1.21a
NOTIFICATION/NCH	9.1.21b
NOTIFICATION/SACCH	9.1.21c
NOTIFICATION RESPONSE	9.1.53
TALKER INDICATION	9.1.44
UPLINK ACCESS	9.1.45
UPLINK BUSY	9.1.46
UPLINK FREE	9.1.47
UPLINK RELEASE	9.1.48
VGCS UPLINK GRANT	9.1.49
Miscellaneous messages:	Reference
CHANNEL MODE MODIFY	9.1.5
CHANNEL MODE MODIFY ACKNOWLEDGE	9.1.6
CHANNEL REQUEST	9.1.8
CLASSMARK CHANGE	9.1.11
CLASSMARK ENQUIRY	9.1.12
FREQUENCY REDEFINITION	9.1.13
MEASUREMENT REPORT	9.1.21
SYNCHRONIZATION CHANNEL INFORMATION	9.1.30
RR STATUS	9.1.29
Configuration Change messages:	Reference
CONFIGURATION CHANGE COMMAND	9.1.12b
CONFIGURATION CHANGE ACKNOWLEDGE	9.1.12c
CONFIGURATION CHANGE REJECT	9.1.12d

9.1.53 Notification response

This message is sent by the mobile station to the network to respond on a notification for a voice group call or voice broadcast call. See table 9.1.53/GSM 04.08.

Message type: NOTIFICATION RESPONSE

Significance: dual

Direction: mobile station to network

Table 9.2.23/GSM 04.08: NOTIFICATION RESPONSE message content

IEI	Information element	Type / Reference	Presence	Format	Length
	RR management protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip Indicator	Skip Indicator 10.3.1	M	V	1/2
	Notification response message type	Message type 10.4	M	V	1
	Group or broadcast call reference	Call reference 10.5.1.9	M	V	5

10.4 Message Type

The message type IE and its use are defined in GSM 04.07. Tables 10.3/GSM 04.08, 10.4/GSM 04.08, and 10.5/GSM 04.08 define the value part of the message type IE used in the Radio Resource management protocol, the Mobility Management protocol, and the Call Control protocol.

Table 10.1/GSM 04.08 (page 1 of 2): Message types for Radio Resource management

8	7	6	5	4	3	2	1	
0	0	1	1	1	-	-	-	Channel establishment messages:
					0	1	1	- ADDITIONAL ASSIGNMENT
					1	1	1	- IMMEDIATE ASSIGNMENT
					0	0	1	- IMMEDIATE ASSIGNMENT EXTENDED
					0	1	0	- IMMEDIATE ASSIGNMENT REJECT
0	0	1	1	0	-	-	-	Ciphering messages:
					1	0	1	- CIPHERING MODE COMMAND
					0	1	0	- CIPHERING MODE COMPLETE
0	0	1	1	0	-	-	-	Configuration change messages:
					0	0	0	- CONFIGURATION CHANGE COMMAND
					0	0	1	- CONFIGURATION CHANGE ACK.
					0	1	1	- CONFIGURATION CHANGE REJECT
0	0	1	0	1	-	-	-	Handover messages:
					1	1	0	- ASSIGNMENT COMMAND
					0	0	1	- ASSIGNMENT COMPLETE
					1	1	1	- ASSIGNMENT FAILURE
					0	1	1	- HANDOVER COMMAND
					1	0	0	- HANDOVER COMPLETE
					0	0	0	- HANDOVER FAILURE
					1	0	1	- PHYSICAL INFORMATION
0	0	0	0	1	-	-	-	Channel release messages:
					1	0	1	- CHANNEL RELEASE
					0	1	0	- PARTIAL RELEASE
					1	1	1	- PARTIAL RELEASE COMPLETE
0	0	1	0	0	-	-	-	Paging and Notification messages:
					0	0	1	- PAGING REQUEST TYPE 1
					0	1	0	- PAGING REQUEST TYPE 2
					1	0	0	- PAGING REQUEST TYPE 3
					1	1	1	- PAGING RESPONSE
					0	0	0	- NOTIFICATION/NCH
					1	0	1	- NOTIFICATION/FACCH
					1	1	0	- NOTIFICATION RESPONSE~~Reserved (see NOTE)~~
0	0	0	0	1	0	1	1	- - Reserved (see NOTE)

(continued...)

NOTE: This value was allocated but never used in earlier phases of the protocol.