3GPP TSG CN Plenary **Tdoc NP-010207**
Meeting #11, Palm Springs, U.S.A **[Rev. from Tdoc NP-010149]**
14th - 16th March 2001

Source: **TSG CN WG 1**

Title: **CRs to R99 on Work Item GSM – UMTS interworking**

Agenda item: **7.16**

Document for: **APPROVAL**

Introduction:

This document contains **10** CRs on **R99** Work Item **" GSM – UMTS interworking"**, that have been agreed by **TSG CN WG1**, and are forwarded to TSG CN Plenary meeting **#11** for approval.

Tdoc	Title	Spec	CR#	Rev	CAT	Rel	C_Ver
N1-010472	Clarification of the PLMN selection for UMTS regarding high quality signal	23.122	014	3	F	R99	3.5.0
N1-010466	Collision case of CN initiated paging and MS initiated MM specific procedures	24.008	372	1	F	R99	3.6.0
N1-010467	Collision case of CN initiated paging and MS initiated MM specific procedures	24.008	381	1	A	Rel-4	4.1.1
N1-010427	Directed Retry procedure allignment	23.009	025		F	R99	3.5.0
N1-010321	GSM to UMTS handover: addition of MAP parameter Target RNC ID	23.009	024		F	R99	3.5.0
N1-010439	Mapping of upper layer event to establishment cause	24.008	370		F	R99	3.6.0
N1-010440	Mapping of upper layer event to establishment cause	24.008	379	1	A	Rel-4	4.1.1
N1-010464	Resume at Intersystem change from GSM to UMTS	24.008	371	1	F	R99	3.6.0
N1-010465	Resume at Intersystem change from GSM to UMTS	24.008	380	1	A	Rel-4	4.1.1
N1-010486	Transfer of the N(SD) duplication avoidance protocol from GSM 04.18	24.007	034		F	R99	3.6.0

3GPP TSG-CN1 Meeting #16
26 Feb. to 01 March 2001, Sophia France.

Tdoc N1-010321

CR-Form-v3

CHANGE REQUEST

⌘ **23.009** **CR** **024** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	GSM to UMTS handover: addition of MAP parameter Target RNC ID
Source:	⌘	TSG_CN WG1
Work item code:	⌘	GSM/UMTS interworking
Date:	⌘	19th February 01
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(essential 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:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change: ⌘

When handover according to MAP phase 2 was specified, it was established as a principle that the MSC receiving the MAP_PREPARE_HANDOVER or MAP_PREPARE SUBSEQUENT_HANDOVER request would receive the target Cell Id not only within the an-APDU (Handover Request), but also as a separate MAP parameter. The reasoning at that time was that the contents of the an-APDU was destined for the target BSS, not for the MSC; therefore, parameters needed by the MSC, e.g. for the routing of messages, should be provided also as parameters on MAP level.

For reasons of consistency the same principle should apply also to the new inter-system handover and relocation procedures, however, according to the current state of the specification:
- in case of GSM->GSM handover and UMTS->GSM handover the target Cell Id is included,
- in case of UMTS->UMTS relocation the target RNC Id is included,
- but in case of GSM->UMTS handover the target RNC Id is **not** included.

The only reason given in CR 23.009-014 for the latter deviation was that the same parameter is already included in the BSSAP message Handover Request. However, this is the same argument that was brought forward when MAP phase 2 handover was standardised, and there is no compelling reason to abandon the principle that was agreed in those days.

To allow the re-use of existing software concepts, it is proposed to add the target RNC Id as a MAP parameter to the MAP_PREPARE_HANDOVER and MAP_PREPARE SUBSEQUENT_HANDOVER service.

Summary of change: ⌘

Consequences if not approved:	⌘	A protocol design principle that was valid since introduction of MAP phase 2 handover would be broken without need.

Clauses affected:	⌘	8.2.1, 8.2.3.1, 8.2.3.2		
Other specs affected:	⌘	[X] Other core specifications [ ] Test specifications [ ] O&M Specifications	⌘	29.002 CR 249, 29.010 CR 012
Other comments:	⌘			

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

8.2.1 Basic Handover procedure requiring a circuit connection between MSC-A and 3G_MSC-B

The procedure used for successful Inter-3G_MSC Handover from GSM to UMTS is shown in figure 24. Initiation of the GSM to UMTS handover procedure is described in clause 5. The procedure described in this subclause makes use of messages from the 3GPP TS 08.08 [5], 3GPP TS 25.413 [11] and of the transport mechanism from the Mobile Application Part (MAP) (3GPP TS 29.002 [12]). After an Inter-3G_MSC handover further Intra-3G_MSC handovers may occur on 3G_MSC-B, these handovers will follow the procedures specified in the previous subclauses.

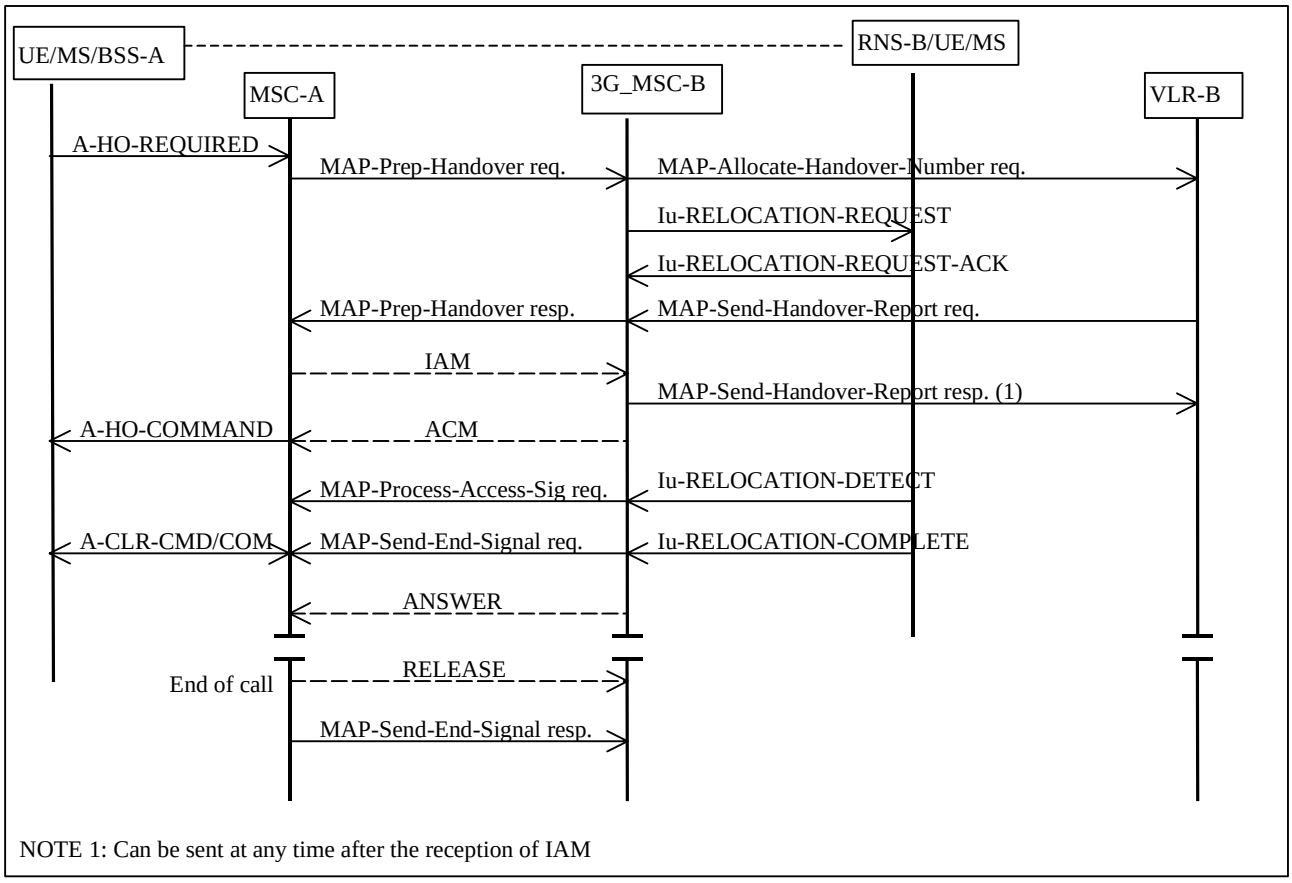

Figure 24: Basic GSM to UMTS Handover Procedure requiring a circuit connection

The GSM to UMTS handover is initiated as described in subclause 6.2.2. (This is represented by A-HO-REQUIRED in figure 24). Upon receipt of the A-HO-REQUIRED from BSS-A, MSC-A shall send a MAP-PREPARE-HANDOVER request to 3G_MSC-B including a complete A-HO-REQUEST message.

NOTE: MSC-A shall not send further MAP-PREPARE-HANDOVER requests while a MAP-PREPARE-HANDOVER response is pending or before any timeouts.

The MAP-PREPARE-HANDOVER request shall carry in the A-HO-REQUEST all information needed by 3G_MSC-B for allocating radio resources in RNS-B, see 3GPP TS 08.08 [5].

The MAP-PREPARE-HANDOVER request shall also carry the identity of the target RNS to which the call is to be handed over, see 3GPP TS 29.002 [12]. 3G_MSC-B will return the MAP-PREPARE-HANDOVER response after having retrieved a Handover Number from its associated VLR (exchange of the messages MAP-allocate-handover-number request and MAP-send-handover-report request). The Handover Number shall be used for routing the connection of the call from MSC-A to 3G_MSC-B. 3G_MSC-B inserts a transcoder as G711 is assumed between 2G MSC and 3G_MSC-B. If radio resources are available in RNS-B the MAP-PREPARE-HANDOVER response, sent to MSC-A from 3G_MSC-B will contain the complete A-HO-REQUEST-ACK message generated from the Iu-RELOCATION-REQUEST-ACK received from RNS-B, containing the radio resources definition to be sent by BSS-A to the UE/MS. If the radio resource allocation is not possible, the MAP-PREPARE-HANDOVER response containing an A-HO-FAILURE will be sent to MSC-A. 3G_MSC-B will do the same if a fault is detected on the identity of the cell where the call has to be handed over. 3G_MSC-B simply reports the events related to the dialogue. It is up to MSC-A to

decide the action to perform if it receives negative responses or the operation fails due to the expiry of the MAP-PREPARE-HANDOVER timer.

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

8.2.3.1 Description of subsequent GSM to UMTS handover procedure i): MSC-B to 3G_MSC-A

The procedure for successful GSM to UMTS handover from MSC-B back to 3G_MSC-A is shown in figure 26.

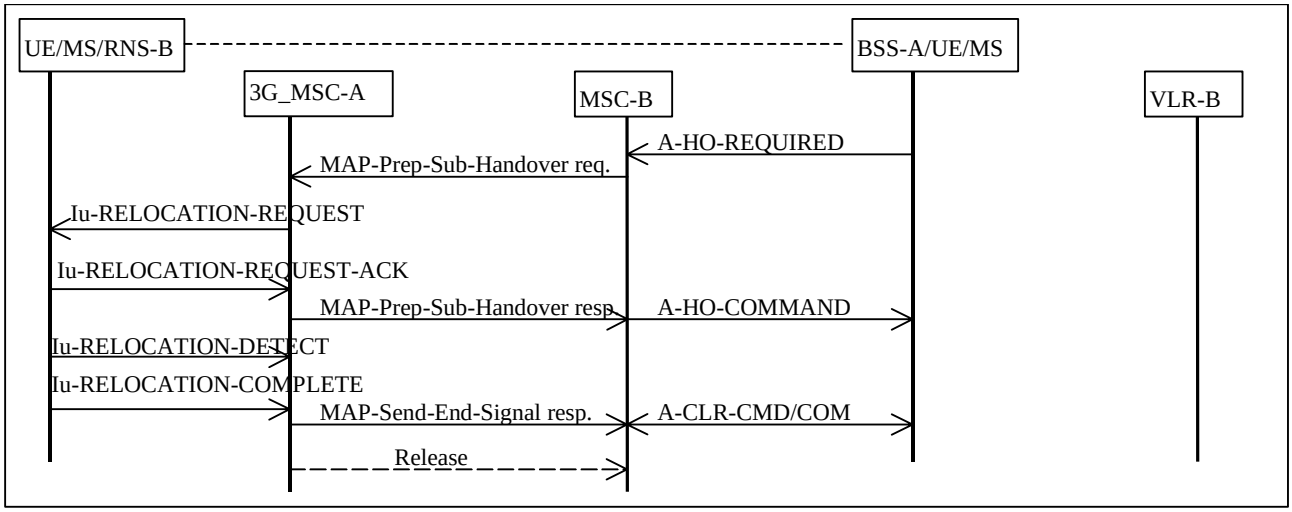

Figure 26: Subsequent GSM to UMTS handover procedure i): successful handover from MSC-B to 3G_MSC-A using a circuit connection

The procedure is as follows.

MSC-B sends the MAP-PREPARE-SUBSEQUENT-HANDOVER request to 3G_MSC-A indicating the new MSC number (3G_MSC-A number), indicating also the identity of the target RNS where the call has to be handed over and including a complete A-HO-REQUEST message. (NOTE: MSC-B shall not send further MAP-PREPARE-SUBSEQUENT-HANDOVER requests while a handover attempt is pending or before any timeouts). Since 3G_MSC-A is the call controlling MSC, this MSC needs no Handover Number for routing purposes; 3G_MSC-A can immediately initiate the search for free radio resources. 3G_MSC-A then inserts a transcoder between it's RNS and the connection to the other party.

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

8.2.3.2 Description of subsequent GSM to UMTS handover procedure ii): MSC-B to 3G_MSC-B'

The procedure for successful GSM to UMTS handover from MSC-B to 3G_MSC-B' is shown in figure 27.

The procedure consists of two parts:

- a subsequent handover from MSC-B back to MSC-A as described in subclause 7.3.1 (the same procedures apply if MSC-A is replaced by 3G_MSC-A); and

- a basic GSM to UMTS handover from MSC-A to 3G_MSC-B' as described in subclause 8.2.1.

MSC-B sends the MAP-PREPARE-SUBSEQUENT-HANDOVER request to MSC-A indicating a new MSC number (which is the identity of 3G_MSC-B'), indicating also the identity of the target RNS where the call has to be handed over and including a complete A-HO-REQUEST, MSC-A then starts a basic handover procedure towards 3G_MSC-B'.

3GPP TSG-CN1 Meeting #16
26 Feb. to 01 March 2001, Sophia France.

Tdoc N1-010427

CR-Form-v3

CHANGE REQUEST

⌘ **23.009** **CR** **025** ⌘ rev **-** ⌘ Current version: **3.5.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Directed Retry procedure allignment
Source:	⌘	TSG_CN WG1
Work item code:	⌘	GSM/UMTS Interworking
Date:	⌘	26/2/2001
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(essential 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:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	This CR proposes to align the Directed Retry procedure from UMTS to GSM between 23.009 v3.5.0 and 25.413 v3.4.0. In RAN WG3 vision, the RAB Assignment procedure shall report the outcome in the response message also in the case of Directed Retry (see 25.413 section 8.2.4). On the other hand, the Directed Retry procedure described in 23.009 v3.5.0, states: “However RNS-A may alternatively send the Iu-RELOCATION-REQUIRED message, indicating 'directed retry', without sending the Iu-RAB-ASSIGNMENT-RESPONSE message”.
Summary of change:	⌘	Removal of the possibility for the RNC of sending the Iu-RELOCATION-REQUIRED message without sending RAB-ASSIGNMENT-RESPONSE message.
Consequences if not approved:	⌘	Description of Directed Retry procedure will remain not aligned with 3GPP TS 25.413 v3.4.0.

Clauses affected:	⌘	14.3		
Other specs affected:	⌘	**X** Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	TS 29.010 CR 015 and CR 016
Other comments:	⌘			

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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.

14.3 UMTS to GSM handover

The directed retry procedure allows the network to select the optimum cell for the UE/MS. The process of directed retry involves the assignment of a UE/MS to a radio channel on a cell other than the serving cell. This process is triggered by the assignment procedures, as described in 3GPP TS 25.413 [1], and employs UMTS to GSM handover procedures as described in clauses 6.2.1 and 8.1. The successful procedure for a directed retry in case of an intra-3G_MSC UMTS to GSM handover is as shown in figure 40b and as described below.

If during the assignment phase, as represented by the Iu-RAB-ASSIGNMENT-REQUEST message, a UMTS to GSM handover becomes necessary, due to either radio conditions or congestion, then the UE/MS may be handed over to a GSM cell. When the decision has been made to handover the UE/MS the RNS-A shall ~~may~~ send an Iu-RAB-ASSIGNMENT-RESPONSE message, indicating 'directed retry', before sending the Iu-RELOCATION-REQUIRED message to 3G_MSC-A, indicating 'directed retry'. ~~However RNS-A may alternatively send the Iu-RELOCATION-REQUIRED message, indicating 'directed retry', without sending the Iu-RAB-ASSIGNMENT-RESPONSE message.~~ Other cause values may be used instead of "Directed Retry" in the Iu-RELOCATION-REQUIRED message, this will allow the 3G_MSC to take different actions dependent on the received cause. Upon receipt of the Iu-RELOCATION-REQUIRED message from RNS-A, then 3G_MSC-A shall initiate the UMTS to GSM handover as described in clauses 6.2.1 and 8.1. No resources shall be cleared in the 3G_MSC-A or RNS-A for this connection.

After receipt of the A-HANDOVER-COMPLETE message from BSS-B the assignment procedure shall be considered to be complete and the resources on RNS-A shall be cleared.

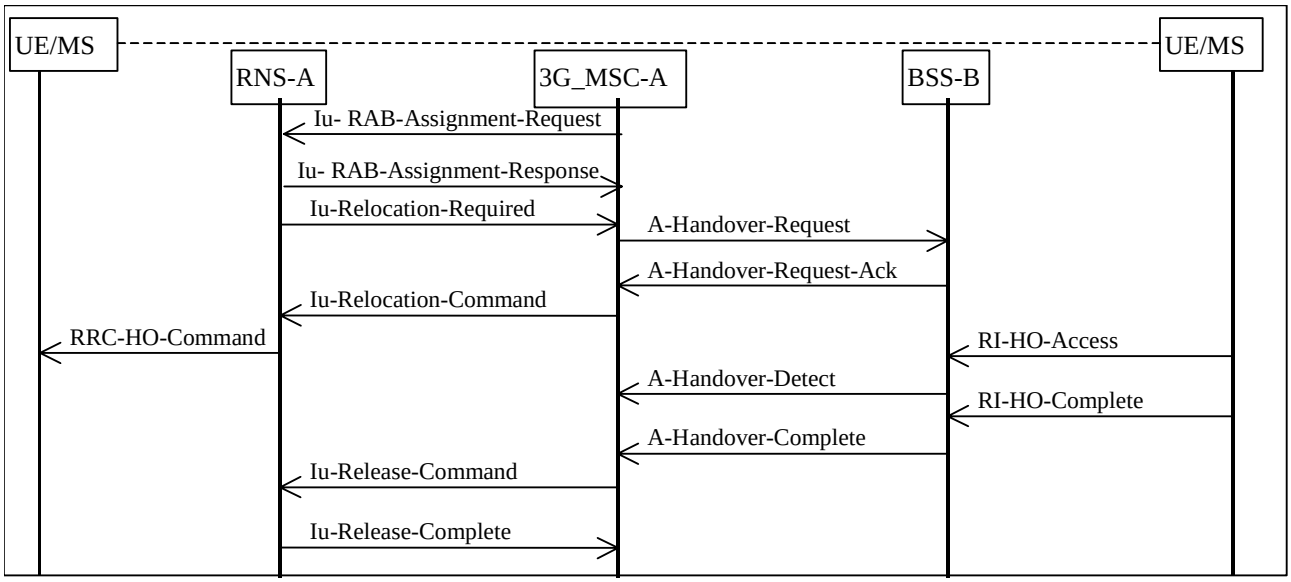

Figure 40b: Example of a Directed Retry Intra-3G_MSC UMTS to GSM Handover Procedure

If a failure occurs during the handover attempt, for example Iu-RELOCATION FAILURE returned from RNS-A or A-HANDOVER-FAILURE from BSS-B then 3G_MSC-A will terminate the UMTS to GSM handover to BSS-B. Under these conditions 3G_MSC-A may optionally take one of a number of actions:

i) send an Iu-RELOCATION-PREPARATION FAILURE to RNS-A, if an Iu-RELOCATION-COMMAND has not already been sent;

ii) retry the assignment procedure to RNS-A, if the failure message was returned from RNS-A. This option is additional to those for normal handover;

iii) Clear the complete call.

The procedures for Inter-3G_MSC UMTS to GSM handover are also applicable to the directed retry process. If an Inter-3G_MSC UMTS to GSM handover is necessary then the assignment process should be considered to have completed successfully upon receipt of the A-HO-COMPLETE included in the MAP-SEND-END-SIGNAL request.

3GPP TSG-CN1 Meeting #16
Sophia Antipolis, France, 26 Feb – 1 Mar, 2001

Tdoc N1-010439
(Revision of N1-010360)

CR-Form-v3

CHANGE REQUEST

⌘ **24.008** **CR** **370** ⌘ rev **-** ⌘ Current version: **3.6.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network **X**

Title:	⌘	Mapping of upper layer event to establishment cause
Source:	⌘	TSG_CN WG1
Work item code:	⌘	GSM/UMTS Interworking
Date:	⌘	2001-02-28
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(essential 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:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	The establishment cause is used by UTRAN to (1) judge whether the RRC connection request should be accepted or rejected in high load situations and (2) to select the initial radio configuration. It is important that it is defined which cause the MS shall use in different situations. If not, then the causes can not be used at all by UTRAN.
Summary of change:	⌘	Tables containing mapping of different upper layer events to establishment causes used at request of RRC connection establishment.
Consequences if not approved:	⌘	Different R99 MSs might use different causes in different situations and then the establishment causes can not be used at all by UTRAN.

Clauses affected:	⌘	Annex L
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

Annex L (~~inform~~normative): ~~Allocation of responsibilities between STCs~~Establishment cause (Iu mode only)

This annex is normative.

L.1 Mapping of NAS procedure to RRC establishment cause(Iu mode only)

When MM requests the establishment of a RR connection, the RRC establishment cause used by the MS shall be selected according to the CS NAS procedure as specified in Table L.1.1.

Table L.1.1/3GPP TS 24.008: Mapping of CS NAS procedure to establishment cause

CS NAS procedure	RRC Establishment cause(according 3GPP TS 25.331)
Originating CS speech call	Originating Conversational Call
Originating CS data call	Originating Conversational Call
CS Emergency call	Emergency call
Call re-establishment	Call re-establishment
Location update	Registration
IMSI Detach	Detach
MO SMS via CS domain	Originating Low Priority Signalling
Supplementary Services	Originating High Priority Signalling
Answer to circuit switched paging	Set equal to the value of the paging cause used in the reception of paging in the RRC layer
Location services	Originating High Priority Signalling

When GMM requests the establishment of a PS signalling connection, the RRC establishment cause used by the MS shall be selected according to the PS NAS procedure as specified in Table L.1.2.

Table L.1.2/3GPP TS 24.008: Mapping of PS NAS procedure to establishment cause

PS NAS procedure	RRC Establishment cause(according 3GPP TS 25.331)
GPRS Attach	Registration
Routing area Update	Registration
GPRS Detach	Detach
Request to re-establish RABs	FFS
Session Management procedures	FFS
MO SMS via PS domain	Originating Low Priority Signalling
Answer to packet paging	Set equal to the value of the paging cause used in the reception of paging in the RRC layer

NOTE: The RRC establishment cause may be used by the network to prioritise the connection establishment request from the MS at high load situations in the network.

3GPP TSG-CN1 Meeting #16
Sophia Antipolis, France, 26 Feb – 1 Mar, 2001

Tdoc N1-010440
(Revision of N1-010361)

CR-Form-v3

CHANGE REQUEST

⌘ **24.008** **CR** **379** ⌘ rev **1** ⌘ Current version: **4.1.1** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network **X**

Title:	⌘	Mapping of upper layer event to establishment cause
Source:	⌘	TSG_CN WG1
Work item code:	⌘	GSM/UMTS Interworking
Date:	⌘	2001-02-28
Category:	⌘	**A**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
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2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The establishment cause is used by UTRAN to (1) judge whether the RRC connection request should be accepted or rejected in high load situations and (2) to select the initial radio configuration. It is important that it is defined which cause the MS shall use in different situations. If not, then the causes can not be used at all by UTRAN.
Summary of change:	⌘	Tables containing mapping of different upper layer events to establishment causes used at request of RRC connection establishment.
Consequences if not approved:	⌘	Different R99 MSs might use different causes in different situations and then the establishment causes can not be used at all by UTRAN.

Clauses affected:	⌘	Annex L		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

Annex L (~~inform~~normative):
~~Allocation of responsibilities between STCs~~ Establishment cause (Iu mode only)

This annex is normative.

L.1 Mapping of NAS procedure to RRC establishment cause(Iu mode only)

When MM requests the establishment of a RR connection, the RRC establishment cause used by the MS shall be selected according to the CS NAS procedure as specified in Table L.1.1.

Table L.1.1/3GPP TS 24.008: Mapping of CS NAS procedure to establishment cause

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CS Emergency call	Emergency call
Call re-establishment	Call re-establishment
Location update	Registration
IMSI Detach	Detach
MO SMS via CS domain	Originating Low Priority Signalling
Supplementary Services	Originating High Priority Signalling
Answer to circuit switched paging	Set equal to the value of the paging cause used in the reception of paging in the RRC layer
Location services	Originating High Priority Signalling

When GMM requests the establishment of a PS signalling connection, the RRC establishment cause used by the MS shall be selected according to the PS NAS procedure as specified in Table L.1.2.

Table L.1.2/3GPP TS 24.008: Mapping of PS NAS procedure to establishment cause

PS NAS procedure	**RRC Establishment cause(according 3GPP TS 25.331)**
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Routing area Update	Registration
GPRS Detach	Detach
Request to re-establish RABs	FFS
Session Management procedures	FFS
MO SMS via PS domain	Originating Low Priority Signalling
Answer to packet paging	Set equal to the value of the paging cause used in the reception of paging in the RRC layer

NOTE: The RRC establishment cause may be used by the network to prioritise the connection establishment request from the MS at high load situations in the network.

3GPP TSG-CN1 Meeting #16
Sophia Antipolis, France, 26 Feb – 1 Mar, 2001

Tdoc N1-010464
(Revision of N1-010362)

CR-Form-v3

CHANGE REQUEST

⌘ **24.008** **CR** **371** ⌘ rev **1** ⌘ Current version: **3.6.0** ⌘

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

Proposed change affects: ⌘ (U)SIM [ ] ME/UE [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Resume at Intersystem change from GSM to UMTS
Source:	⌘	TSG_CN WG1
Work item code:	⌘	GSM/UMTS Interworking
Date:	⌘	2001-02-28
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
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Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	If an MS in MS operation mode B is handovered during a CS call from a GSM cell to a UMTS cell; or an MS in MS operation mode A capable of DTM is handovered during a CS call from a GSM cell not supporting DTM to a UMTS cell, then due to the "Selective RAU" the MS will not send an RAU directly when entering the UMTS cell. The MS will wait until it has pending uplink data or signalling.
Summary of change:	⌘	This CR proposes that if an MS in MS operation mode B is handovered during a CS call from a GSM cell to a UMTS cell; or an MS in MS operation mode A capable of DTM is handovered during a CS call from a GSM cell not supporting DTM to a UMTS cell, then the MS shall perform an RA Update procedure when the handover procedure is completed.
Consequences if not approved:	⌘	Some MSs will be suspended in the SGSN for GPRS services in downlink after an HO during a CS connection from GSM to UMTS until the MS has uplink data or signalling to send.

Clauses affected:	⌘	2.2.2, 4.7.1.7
Other specs affected:	⌘	[ ] Other core specifications ⌘ [ ] Test specifications [ ] O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[83] 3GPP TS 04.18: "Mobile radio interface layer 3 specification, Radio Resource Control Protocol"

[84] 3GPP TS 03.55: "Dual Transfer Mode; Stage 2"

2.2.2 Vocabulary

The following terms are used in this Technical Specification:

- A **GSM security context** is established and stored in the MS and the network as a result of a successful execution of a GSM authentication challenge. The GSM security context consists of the GSM ciphering key and the ciphering key sequence number.
- A **UMTS security context** is established and stored in the MS and the network as a result of a successful execution of a UMTS authentication challenge. The UMTS security context consists of the UMTS ciphering key, the UMTS integrity key, the GSM ciphering key and the cipher key sequence number.
- **idle mode:** In this mode, the mobile station is not allocated any dedicated channel; it listens to the CCCH and the BCCH;
- **group receive mode:** (only applicable for mobile stations supporting VGCS listening or VBS listening) In this mode, the mobile station is not allocated a dedicated channel with the network; it listens to the downlink of a voice broadcast channel or voice group call channel allocated to the cell. Occasionally, the mobile station has to listen to the BCCH of the serving cell as defined in TS 03.22 and 05.08;
- **dedicated mode:** In this mode, the mobile station is allocated at least two dedicated channels, only one of them being a SACCH;
- **group transmit mode:** (only applicable for mobile stations supporting VGCS talking) In this mode, one mobile station of a voice group call is allocated two dedicated channels, one of them being a SACCH. These channels can be allocated to one mobile station at a time but to different mobile stations during the voice group call;
- **packet idle mode**: (only applicable for mobile stations supporting GPRS) In this mode, mobile station is not allocated any radio resource on a packet data physical channel; it listens to the PBCCH and PCCCH or, if those are not provided by the network, to the BCCH and the CCCH, see GSM 04.60.
- **packet transfer mode**: (only applicable for mobile stations supporting GPRS) In this mode, the mobile station is allocated radio resource on one or more packet data physical channels for the transfer of LLC PDUs.
- **main DCCH:** In Dedicated mode and group transmit mode, only two channels are used as DCCH, one being a SACCH, the other being a SDCCH or a FACCH; the SDCCH or FACCH is called here "the main DCCH";
- A channel is **activated** if it can be used for transmission, in particular for signalling, at least with UI frames. On the SACCH, whenever activated, it must be ensured that a contiguous stream of layer 2 frames is sent;

- A TCH is **connected** if circuit mode user data can be transferred. A TCH cannot be connected if it is not activated. A TCH which is activated but not connected is used only for signalling, i.e. as a DCCH;

- The data link of SAPI 0 on the main DCCH is called the **main signalling link**. Any message specified to be sent on the main signalling link is sent in acknowledged mode except when otherwise specified;

- The term **"to establish"** a link is a short form for **"to establish the multiframe mode"** on that data link. It is possible to send UI frames on a data link even if it is not established as soon as the corresponding channel is activated. Except when otherwise indicated, a data link layer establishment is done without an information field.

- **"channel set"** is used to identify TCHs that carry related user information flows, e.g., in a multislot configuration used to support circuit switched connection(s), which therefore need to be handled together.

- A **temporary block flow** (TBF) is a physical connection used by the two RR peer entities to support the uni-directional transfer of LLC PDUs on packet data physical channels, see GSM 04.60.

- **RLC/MAC block:** A RLC/MAC block is the protocol data unit exchanged between RLC/MAC entities, see GSM 04.60.

- A **GMM context** is established when a GPRS attach procedure is successfully completed.

- **Network operation mode**

  The three different network operation modes I, II, and III are defined in 3GPP TS 23.060 [74].

The network operation mode shall be indicated as system information. For proper operation, the network operation mode should be the same in each cell of one routing area.

- **GPRS MS operation mode**

  The three different GPRS MS operation modes A, B, and C are defined in 3GPP TS 23.060 [74].

- **RR connection:** A RR connection is a dedicated physical circuit switched domain connection used by the two RR or RRC peer entities to support the upper layers' exchange of information flows.

- **PS signalling connection** is a peer to peer UMTS connection between MS and CN packet domain node.

- **Inter-System change** is a change of radio access between different radio access technologies such as GSM and UMTS.

- **GPRS:** Packet Services for GSM and UMTS system.

- The label **(GSM only)** indicates this section or paragraph applies only to GSM system. For multi system case this is determined by the current serving radio access network.

- The label **(UMTS only)** indicates this section or paragraph applies only to UMTS system. For multi system case this is determined by the current serving radio access network.

- **In GSM,...** Indicates this paragraph applies only to GSM System. For multi system case this is determined by the current serving radio access network.

- **In UMTS,...** Indicates this paragraph applies only to UMTS System. For multi system case this is determined by the current serving radio access network.

- **SIM,** Subscriber Identity Module (see 3GPP TS 02.17). This specification makes no distinction between SIM and USIM.

- **MS,** Mobile Station. This specification makes no distinction between MS and UE.

- **Cell Notification** is an (optimised) variant of the Cell Update Procedure which uses the LLC NULL frame for cell change notification which does not trigger the restart of the READY timer

- DTM: dual transfer mode, see 3GPP TS 04.18[83] and 3GPP TS 03.55 [84].

***** Next Modification *****

4.7.1.7 Intersystem change between GSM and UMTS

For the UMTS to GSM and GSM to UMTS intersystem change the following cases can be distinguished:

a) Intersystem change between cells belonging to different RA's
The procedures executed by the MS depends on the network mode of operation in the old and new RA. If a change of the network operation mode has occurred in the new RA, then the MS shall behave as specified in section 4.7.1.6. If no change of the network operation mode has occurred in the new RA, then the MS shall initiate the normal or combined RA update procedure depending on the network operation mode in the current RA.

b) Intersystem change between cells belonging to the same RA:

If the READY timer is running in the MS in GSM or the MS is in PMM-CONNECTED mode in UMTS, then the MS shall perform a normal or combined RA update procedure depending on the network mode of operation in the current RA.

If the READY timer is not running in the MS in GSM or the MS is in PMM-IDLE mode in UMTS, then the MS shall not perform a RA update procedure (as long as the MS stays within the same RA) until up-link user data or signalling information needs to be sent from the MS to the network.

- If the MS is in the same access network, GSM or UMTS, as when it last sent user data or signalling messages, the procedures defined for that access system shall be followed. This shall be sending of an LLC PDU in a GSM cell or initiating the SERVICE REQUEST procedure in a UMTS cell.

- If the MS is in a different access network, GSM or UMTS, as when it last sent user data or signalling messages, the normal or combined RA update procedure shall be performed depending on the network operation mode in the current RA, before the sending of user data or signalling messages. If the signalling message is a DETACH REQUEST containing cause "power off", the RA update procedure need not to be performed.

- If the periodic routing area update timer expires the MS shall initiate the periodic RA update procedure.

If the READY timer is not running in the network in GSM or the network is in PMM-IDLE mode in UMTS, then the network shall page the MS if down-link user data or signalling information needs to be sent from the network to the MS. This shall include both GSM and UMTS cells.

- If the MS receives the paging indication in the same access network, GSM or UMTS, as when it last sent user data or signalling information, the MS shall send any LLC PDU in a GSM cell or shall initiate the SERVICE REQUEST procedure indicating service type "paging response" in a UMTS cell.

- If the MS receives the paging indication in a different access network, GSM or UMTS, as when it last sent user data or signalling information, the normal or combined RA update procedure shall be performed depending on the network operation mode in the current RA.

c) Intersystem handover from GSM to UMTS during a CS connection:

After the successful completion of the handover from an GSM cell to an UMTS cell, an MS which has performed the GPRS suspension procedure in Gb mode (see TS 04.18) (i.e. an MS in MS operation mode B or an DTM MS in a GSM cell that does not support DTM) shall perform a normal RA update procedure in the UMTS cell in order to resume the GPRS services in the network, before sending any other signalling messages or user data.

3GPP TSG-CN1 Meeting #16 ***Tdoc N1-010465***
Sophia Antipolis, France, 26 Feb – 1 Mar, 2001 **(Revision of N1-010363)**

CR-Form-v3

CHANGE REQUEST

⌘ **24.008** **CR** **380** ⌘ rev **1** ⌘ Current version: **4.1.1** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network **X**

Title:	⌘	Resume at Intersystem change from GSM to UMTS
Source:	⌘	TSG_CN WG1
Work item code:	⌘	GSM/UMTS Interworking
Date:	⌘	2001-02-28
Category:	⌘	**A**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential 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:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	If an MS in MS operation mode B is handovered during a CS call from a GSM cell to a UMTS cell; or an MS in MS operation mode A capable of DTM is handovered during a CS call from a GSM cell not supporting DTM to a UMTS cell, then due to the "Selective RAU" the MS will not send an RAU directly when entering the UMTS cell. The MS will wait until it has pending uplink data or signalling.
Summary of change:	⌘	This CR proposes that if an MS in MS operation mode B is handovered during a CS call from a GSM cell to a UMTS cell; or an MS in MS operation mode A capable of DTM is handovered during a CS call from a GSM cell not supporting DTM to a UMTS cell, then the MS shall perform an RA Update procedure when the handover procedure is completed.
Consequences if not approved:	⌘	Some MSs will be suspended in the SGSN for GPRS services in downlink after an HO during a CS connection from GSM to UMTS until the MS has uplink data or signalling to send.

Clauses affected:	⌘	2.2.2, 4.7.1.7
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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2 Normative references

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[83] 3GPP TS 44.018: "Mobile radio interface layer 3 specification, Radio Resource Control Protocol"

[84] 3GPP TS 03.55: "Dual Transfer Mode; Stage 2"

2.2.2 Vocabulary

The following terms are used in this Technical Specification:

- A **GSM security context** is established and stored in the MS and the network as a result of a successful execution of a GSM authentication challenge. The GSM security context consists of the GSM ciphering key and the ciphering key sequence number.
- A **UMTS security context** is established and stored in the MS and the network as a result of a successful execution of a UMTS authentication challenge. The UMTS security context consists of the UMTS ciphering key, the UMTS integrity key, the GSM ciphering key and the cipher key sequence number.
- **idle mode:** In this mode, the mobile station is not allocated any dedicated channel; it listens to the CCCH and the BCCH;
- **group receive mode:** (only applicable for mobile stations supporting VGCS listening or VBS listening) In this mode, the mobile station is not allocated a dedicated channel with the network; it listens to the downlink of a voice broadcast channel or voice group call channel allocated to the cell. Occasionally, the mobile station has to listen to the BCCH of the serving cell as defined in TS 03.22 and 05.08;
- **dedicated mode:** In this mode, the mobile station is allocated at least two dedicated channels, only one of them being a SACCH;
- **group transmit mode:** (only applicable for mobile stations supporting VGCS talking) In this mode, one mobile station of a voice group call is allocated two dedicated channels, one of them being a SACCH. These channels can be allocated to one mobile station at a time but to different mobile stations during the voice group call;
- **packet idle mode**: (only applicable for mobile stations supporting GPRS) In this mode, mobile station is not allocated any radio resource on a packet data physical channel; it listens to the PBCCH and PCCCH or, if those are not provided by the network, to the BCCH and the CCCH, see GSM 04.60.
- **packet transfer mode**: (only applicable for mobile stations supporting GPRS) In this mode, the mobile station is allocated radio resource on one or more packet data physical channels for the transfer of LLC PDUs.
- **main DCCH:** In Dedicated mode and group transmit mode, only two channels are used as DCCH, one being a SACCH, the other being a SDCCH or a FACCH; the SDCCH or FACCH is called here "the main DCCH";
- A channel is **activated** if it can be used for transmission, in particular for signalling, at least with UI frames. On the SACCH, whenever activated, it must be ensured that a contiguous stream of layer 2 frames is sent;

- A TCH is **connected** if circuit mode user data can be transferred. A TCH cannot be connected if it is not activated. A TCH which is activated but not connected is used only for signalling, i.e. as a DCCH;

- The data link of SAPI 0 on the main DCCH is called the **main signalling link**. Any message specified to be sent on the main signalling link is sent in acknowledged mode except when otherwise specified;

- The term **"to establish"** a link is a short form for **"to establish the multiframe mode"** on that data link. It is possible to send UI frames on a data link even if it is not established as soon as the corresponding channel is activated. Except when otherwise indicated, a data link layer establishment is done without an information field.

- **"channel set"** is used to identify TCHs that carry related user information flows, e.g., in a multislot configuration used to support circuit switched connection(s), which therefore need to be handled together.

- A **temporary block flow** (TBF) is a physical connection used by the two RR peer entities to support the uni-directional transfer of LLC PDUs on packet data physical channels, see GSM 04.60.

- **RLC/MAC block:** A RLC/MAC block is the protocol data unit exchanged between RLC/MAC entities, see GSM 04.60.

- A **GMM context** is established when a GPRS attach procedure is successfully completed.

- **Network operation mode**

  The three different network operation modes I, II, and III are defined in 3GPP TS 23.060 [74].

The network operation mode shall be indicated as system information. For proper operation, the network operation mode should be the same in each cell of one routing area.

- **GPRS MS operation mode**

  The three different GPRS MS operation modes A, B, and C are defined in 3GPP TS 23.060 [74].

- **RR connection:** A RR connection is a dedicated physical circuit switched domain connection used by the two RR or RRC peer entities to support the upper layers' exchange of information flows.

- **PS signalling connection** is a peer to peer UMTS connection between MS and CN packet domain node.

- **Inter-System change** is a change of radio access between different radio access technologies such as GSM and UMTS.

- **GPRS:** Packet Services for GSM and UMTS system.

- The label **(GSM only)** indicates this section or paragraph applies only to GSM system. For multi system case this is determined by the current serving radio access network.

- The label **(UMTS only)** indicates this section or paragraph applies only to UMTS system. For multi system case this is determined by the current serving radio access network.

- **In GSM,...** Indicates this paragraph applies only to GSM System. For multi system case this is determined by the current serving radio access network.

- **In UMTS,...** Indicates this paragraph applies only to UMTS System. For multi system case this is determined by the current serving radio access network.

- **SIM,** Subscriber Identity Module (see 3GPP TS 02.17). This specification makes no distinction between SIM and USIM.

- **MS,** Mobile Station. This specification makes no distinction between MS and UE.

- **Cell Notification** is an (optimised) variant of the Cell Update Procedure which uses the LLC NULL frame for cell change notification which does not trigger the restart of the READY timer

- DTM: dual transfer mode, see 3GPP TS 44.018[83] and 3GPP TS 03.55 [84]

***** Next Modification *****

4.7.1.7 Intersystem change between GSM and UMTS

For the UMTS to GSM and GSM to UMTS intersystem change the following cases can be distinguished:

a) Intersystem change between cells belonging to different RA's
The procedures executed by the MS depends on the network mode of operation in the old and new RA. If a change of the network operation mode has occurred in the new RA, then the MS shall behave as specified in section 4.7.1.6. If no change of the network operation mode has occurred in the new RA, then the MS shall initiate the normal or combined RA update procedure depending on the network operation mode in the current RA.

b) Intersystem change between cells belonging to the same RA:

If the READY timer is running in the MS in GSM or the MS is in PMM-CONNECTED mode in UMTS, then the MS shall perform a normal or combined RA update procedure depending on the network mode of operation in the current RA.

If the READY timer is not running in the MS in GSM or the MS is in PMM-IDLE mode in UMTS, then the MS shall not perform a RA update procedure (as long as the MS stays within the same RA) until up-link user data or signalling information needs to be sent from the MS to the network.

- If the MS is in the same access network, GSM or UMTS, as when it last sent user data or signalling messages, the procedures defined for that access system shall be followed. This shall be sending of an LLC PDU in a GSM cell or initiating the SERVICE REQUEST procedure in a UMTS cell.

- If the MS is in a different access network, GSM or UMTS, as when it last sent user data or signalling messages, the normal or combined RA update procedure shall be performed depending on the network operation mode in the current RA, before the sending of user data or signalling messages. If the signalling message is a DETACH REQUEST containing cause "power off", the RA update procedure need not to be performed.

- If the periodic routing area update timer expires the MS shall initiate the periodic RA update procedure.

If the READY timer is not running in the network in GSM or the network is in PMM-IDLE mode in UMTS, then the network shall page the MS if down-link user data or signalling information needs to be sent from the network to the MS. This shall include both GSM and UMTS cells.

- If the MS receives the paging indication in the same access network, GSM or UMTS, as when it last sent user data or signalling information, the MS shall send any LLC PDU in a GSM cell or shall initiate the SERVICE REQUEST procedure indicating service type "paging response" in a UMTS cell.

- If the MS receives the paging indication in a different access network, GSM or UMTS, as when it last sent user data or signalling information, the normal or combined RA update procedure shall be performed depending on the network operation mode in the current RA.

c) Intersystem handover from GSM to UMTS during a CS connection:

After the successful completion of the handover from an GSM cell to an UMTS cell, an MS which has performed the GPRS suspension procedure in Gb mode (see TS 44.018) (i.e. an MS in MS operation mode B or an DTM MS in a GSM cell that does not support DTM) shall perform a normal RA update procedure in the UMTS cell in order to resume the GPRS services in the network, before sending any other signalling messages or user data.

3GPP TSG-CN1 Meeting #16
Sophia Antipolis, France, 26 Feb – 1 Mar, 2001

Tdoc N1-010466
(Revision of N1-010366)

CR-Form-v3

CHANGE REQUEST

⌘ **24.008** **CR** **372** ⌘ rev **1** ⌘ Current version: **3.6.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network **X**

Title:	⌘	Collision case of CN initiated paging and MS initiated MM specific procedures
Source:	⌘	TSG_CN WG1
Work item code:	⌘	GSM/UMTS Interworking
Date:	⌘	2001-02-28
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(essential 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:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change: ⌘ In UMTS it is not clarified how the MS shall proceed when a collision case of an MS initiated MM procedure and a core network initiated paging for CS services occurs.

(In GSM this case can not happen as the MS stops monitoring the PCCH and starts the SDCCH. The MS is not expected to receive any page on SDCCH.)

The 'loss' of CS page will be catched with network repetition if necessary.

At CN1 #15 a similar clarification was agreed for GPRS in Tdoc N1 –010174 for collision cases for CN initaited paging and MS initaited GMM specific procedures.

Summary of change: ⌘ This CR clarifies in UMTS that the MS shall ignore the paging and progress the MM inititiated procedure and the network shall proceed the MM procedure.

Consequences if not approved: ⌘

Clauses affected: ⌘ 4.5.1.3.3

Other specs affected: ⌘
☐ Other core specifications ⌘
☐ Test specifications
☐ O&M Specifications

Other comments: ⌘

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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.

4.5.1.3.3 Paging response in UMTS (UMTS only)

The network may initiate the paging procedure for CS services when the MS is IMSI attached for CS services. To initiate the procedure, the MM entity requests the RR sublayer to initiate paging (see 3GPP TS 25.331 and 3GPP TS 25.413) for CS services.

At reception of a paging message, the RR sublayer in the MS shall deliver a paging indication to the MM sublayer if the paging was initiated by the MM entity in the network (see 3GPP TS 25.331). The MS shall respond with the PAGING RESPONSE message defined in GSM 04.18, chapter 9.1.25. For reasons of backward compatibility the paging response shall use the RR protocol discriminator.

If the MS receives a paging request for CS services during an ongoing MM procedure, and the MS has already requested the establishment of a radio connection, the MS shall ignore the paging request and the MS and the network shall continue the MM procedure.

3GPP TSG-CN1 Meeting #16
Sophia Antipolis, France, 26 Feb – 1 Mar, 2001

Tdoc N1-010467
(Revision of N1-010367)

CR-Form-v3

CHANGE REQUEST

⌘ **24.008** **CR** **381** ⌘ rev **1** ⌘ Current version: **4.1.1** ⌘

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

Proposed change affects: ⌘ (U)SIM [ ] ME/UE [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Collision case of CN initiated paging and MS initiated MM specific procedures
Source:	⌘	TSG_CN WG1
Work item code:	⌘	GSM/UMTS Interworking
Date:	⌘	2001-02-28
Category:	⌘	**A**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential 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:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	In UMTS it is not clarified how the MS shall proceed when a collision case of an MS initiated MM procedure and a core network initiated paging for CS services occurs. (In GSM this case can not happen as the MS stops monitoring the PCCH and starts the SDCCH. The MS is not expected to receive any page on SDCCH.) The 'loss' of CS page will be catched with network repetition if necessary. At CN1 #15 a similar clarification was agreed for GPRS in Tdoc N1 –010174 for collision cases for CN initaited paging and MS initaited GMM specific procedures.
Summary of change:	⌘	This CR clarifies in UMTS that the MS shall ignore the paging and progress the MM inititiated procedure and the network shall proceed the MM procedure.
Consequences if not approved:	⌘	

Clauses affected:	⌘	4.5.1.3.3
Other specs affected:	⌘	[ ] Other core specifications [ ] Test specifications [ ] O&M Specifications
Other comments:	⌘	

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Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

4.5.1.3.3 Paging response in UMTS (UMTS only)

The network may initiate the paging procedure for CS services when the MS is IMSI attached for CS services. To initiate the procedure, the MM entity requests the RR sublayer to initiate paging (see TS 25.331 and TS 25.413) for CS services.

At reception of a paging message, the RR sublayer in the MS shall deliver a paging indication to the MM sublayer if the paging was initiated by the MM entity in the network (see TS 25.331). The MS shall respond with the PAGING RESPONSE message defined in GSM 04.18, chapter 9.1.25. For reasons of backward compatibility the paging response shall use the RR protocol discriminator.

If the MS receives a paging request for CS services during an ongoing MM procedure, and the MS has already requested the establishment of a radio connection, the MS shall ignore the paging request and the MS and the network shall continue the MM procedure.

3GPP TSG-CN1 Meeting #15
15-19 January 2001, Beijing, China

Tdoc N1-010472
Revision of N1-010429
Revision of N1-010170
Revision of N1-010059

CR-Form-v3

CHANGE REQUEST

⌘ **23.122** **CR** **014** ⌘ rev **3** ⌘ Current version: **3.5.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Clarification of the PLMN selection for UMTS regarding high quality signal
Source:	⌘	TSG_CN WG1
Work item code:	⌘	GSM/UMTS interworking
Date:	⌘	28/02/01
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(essential 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:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change: ⌘

The PLMN selection procedure uses a signal quality level "High quality signal" for automatic and manual selection. In automatic mode, if the RPLMN, the HPLMN and no preferred PLMN stored in the SIM can be found, the MS shall first select randomly among the PLMN/AS having signal quality above this "high signal quality" limit. Then, if no PLMN/AS above the limit can be found, the MS shall select among PLMN/AS having signal quality lower than the limit in decreasing signal quality. The same apply to the list displayed to the user in manual mode.

N1 sent a liaison to RAN2 to ask for a definition of the "high quality signal" level for UMTS. In the response liaison R2-002473 (received as N1-010012), RAN2 states that:

"This issue was discussed at R2/R4 Ad Hoc meeting 13 Nov 2000, where the following conclusions were agreed:

1. Search scheme and criteria for classifying a UTRA PLMN as having "high quality signal" have been defined. See attached CR to TS 25.304. The criteria might be modified, if later found necessary.
   At automatic or manual network selection, only UTRA PLMN/cells fulfilling these criteria are reported to higher layers.
   Actual values on "high quality signal" limits are to be decided by TSG-RAN WG4.

2. Ranking of UTRA PLMNs and e.g. GSM PLMNs based on signal quality comparisons is not feasible at network selection, since the characteristics of the radio access technologies are quite different.
   Consequently, UTRA PLMNs not classified as having "high quality signal" are not reported to higher layers at network selection.

	” In light of the recent 3GPP ad hoc on PLMN selection and idle mode, held in Helsinki, on 7 – 8 February 2001, RAN WG4 have given consideration to the definition of the threshold for what is termed ‘high quality cell’. In liaison-R4-010427 (received as N1-010012), RAN4 states that: “The conclusion of RAN WG4 is that the threshold for FDD shall be CPICH RSCP = -95 dBm. The threshold for TDD shall be PCCPCH RSCP = -84 dBm. Furthermore, for PLMNs with CPICH RSCP or PCCPCH RSCP below the threshold, the ranking shall be performed according to the CPICH RSCP or PCCPCH RSCP.”
Summary of change: ⌘	This CR clarifies the step v “other PLMN/access technology combinations in order of decreasing signal quality”.
Consequences if not approved: ⌘	Specification of PLMN selection not complete.

Clauses affected:	⌘	4.4.3.1.1, 4.4.3.1.2, 4.4.3.2.1		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

1.2 Definitions and abbreviations

For the purposes of the present document the abbreviations given in 3GPP TS 01.04 and 3GPP TS 21.905 apply.

(A/Gb mode only): Indicates this clause or subclause applies only to GSM system. For multi system case this is determined by the current serving radio access network.

(Iu mode only): Indicates this clause or subclause applies only to UMTS system. For multi system case this is determined by the current serving radio access network.

Acceptable Cell: This is a cell that the MS may camp on to make emergency calls. It must satisfy criteria which is defined for A/Gb mode in 3GPP TS 03.22 and for Iu mode in 3GPP TS 25.304.

Access Technology: The access technology associated with a PLMN. The MS uses this information to determine what type of radio carrier to search for when attempting to select a specific PLMN (e.g., GSM, UMTS or GSM COMPACT). A PLMN may support more than one access technology.

Allowable PLMN: This is a PLMN which is not in the list of forbidden PLMNs in the MS.

Available PLMN: This is a PLMN where the MS has found a cell that satisfies conditions (ii) and (iv) of subclause 3.2.1 in 3GPP TS 03.22. For Iu mode the criteria is specified in 3GPP TS 25.304.

Camped on a cell: The MS (ME if there is no SIM) has completed the cell selection/reselection process and has chosen a cell from which it plans to receive all available services. Note that the services may be limited, and that the PLMN may not be aware of the existence of the MS (ME) within the chosen cell.

Current serving cell: This is the cell on which the MS is camped.

CTS MS: An MS capable of CTS services is a CTS MS.

GPRS MS: An MS capable of GPRS services is a GPRS MS.

High quality signal: The high quality signal limit is used in the PLMN selection procedure. It is defined in the appropriate AS specification: GSM TS 03.22 for the GSM radio access technology, 3G TS 25.304 for the UMTS radio access technology (FDD or TDD mode).

Home PLMN: This is a PLMN where the MCC and MNC of the PLMN identity match the MCC and MNC of the IMSI. Matching criteria are defined in Annex A.

In A/Gb mode,...: Indicates this paragraph applies only to GSM System. For multi system case this is determined by the current serving radio access network.

In Iu mode,...: Indicates this paragraph applies only to UMTS System. For multi system case this is determined by the current serving radio access network.

Localised Service Area (LSA): A localised service area consists of a cell or a number of cells. The cells constituting a LSA may not necessarily provide contiguous coverage.

Location Registration (LR): An MS which is IMSI attached to non-GPRS services only performs location registration by the Location Updating procedure. A GPRS MS which is IMSI attached to GPRS services or to GPRS and non-GPRS services performs location registration by the Routing Area Update procedure only when in a network of network operation mode I. Both procedures are performed independently by the GPRS MS when it is IMSI attached to GPRS and non-GPRS services in a network of network operation mode II or III (see 3GPP TS 23.060).

MS: Mobile Station. This specification makes no distinction between MS and UE.

Network Type: The network type associated with HPLMN or a PLMN on the PLMN selector (see GSM 11.11). The MS uses this information to determine what type of radio carrier to search for when attempting to select a specific PLMN. A PLMN may support more than one network type.

Registered PLMN (RPLMN): This is the PLMN on which certain LR outcomes have occurred (see table 1).

Registration: This is the process of camping on a cell of the PLMN and doing any necessary LRs.

Registration Area: A registration area is an area in which mobile stations may roam without a need to perform location registration. The registration area corresponds to location area (LA) for performing location updating procedure and it corresponds to routing area for performing the routing area update procedure.

The PLMN to which a cell belongs (PLMN identity) is given in the system information transmitted on the BCCH (MCC + MNC part of LAI).

Selected PLMN: This is the PLMN that has been selected according to subclause 3.1, either manually or automatically.

SIM: Subscriber Identity Module (see 3GPP TS 02.17). This specification makes no distinction between SIM and USIM.

SoLSA exclusive access: Cells on which normal camping is allowed only for MS with Localised Service Area (LSA) subscription.

Suitable Cell: This is a cell on which an MS may camp. It must satisfy criteria which is defined for A/Gb mode in 3GPP TS 03.22 and for Iu mode in 3GPP TS 25.304.

Visited PLMN of home country: This is a PLMN, different from the home PLMN, where the MCC part of the PLMN identity is the same as the MCC of the IMSI.

********* *Next modified section* *********

4.4.3.1.1 Automatic Network Selection Mode Procedure

The MS selects and attempts registration on other PLMNs, if available and allowable, in the following order:

i) HPLMN (if not previously selected);

ii) each PLMN in the "User Controlled PLMN Selector with Access Technology" data field in the SIM (in priority order);

iii) each PLMN in the "Operator Controlled PLMN Selector with Access Technology" data field in the SIM (in priority order);

iv) other PLMN/access technology combinations with received high quality signal in random order;

v) other PLMN/access technology combinations in order of decreasing signal quality.

When following the above procedure the following requirements apply:

a) In A/Gb mode or GSM COMPACT, an MS with voice capability shall ignore PLMNs for which the MS has identified at least one cell that do not offer voice service. (In A/Gb mode, this is indicated by the CELL_BAR_QUALIFY_2 parameter).

b) In A/Gb mode or GSM COMPACT, an MS with voice capability , or an MS not supporting packet services shall not search for CPBCCH carriers.

c) In ii and iii, the MS should limit its search for the PLMN to the access technology or access technologies associated with the PLMN in the appropriate PLMN Selector with Access Technology list (User Controlled or Operator Controlled selector list). An MS using a SIM without access technology information storage (i.e. the "User Controlled PLMN Selector with Access Technology" and the "Operator Controlled PLMN Selector with Access Technology" data fields are not present) shall instead use the "PLMN Selector" data field, for each PLMN in the "PLMN Selector" data field, the MS shall search for all access technologies it is capable of and shall assume GSM access technology as the highest priority radio access technology.

d) In iv and v, the MS shall search for all access technologies it is capable of, before deciding which PLMN to select.

e) In ii, and iii, a packet only MS which supports GSM COMPACT, but using a SIM without access technology information storage (i.e. the "User Controlled PLMN Selector with Access Technology" and the "Operator Controlled PLMN Selector with Access Technology" data fields are not present) shall instead use the "PLMN Selector" data field, for each PLMN in the "PLMN Selector" data field, the MS shall search for all access technologies it is capable of and shall assume GSM COMPACT access technology as the lowest priority radio access technology.

f) In i, the MS shall search for all access technologies it is capable of. The MS shall start its search using the access technologies stored in the "HPLMN Selector with Access Technology" data field on the SIM in priority order as defined in section 4.4.3 (i.e. the PLMN/access technology combinations are listed in priority order, if an entry includes more than one access technology then no priority is defined for the preferred access technology and the priority is an implementation issue).

g) ~~g)~~ In i, an MS using a SIM without access technology information storage (i.e. the "HPLMN Selector with Access Technology" data field is not present) shall search for all access technologies it is capable of and shall assume GSM access technology as the highest priority radio access technology. A packet only MS which supports GSM COMPACT using a SIM without access technology information storage shall also assume GSM COMPACT access technology as the lowest priority radio access technology.

h) In v, the MS shall order the PLMN/access technology combinations in order of decreasing signal quality within each access technology. The order between PLMN/access technology combinations with different access technologies is an MS implementation issue.

NOTE: Requirements a) and b) apply also to requirement d), so a GSM voice capable MS should not search for GSM COMPACT PLMNs, even if capable of GSM COMPACT.

NOTE: Requirements a) and b) apply also to requirement f), so a GSM voice capable MS should not search for GSM COMPACT PLMNs, even if this is the only access technology on the "HPLMN Selector with Access Technology" data field on the SIM. Also PLMNs not offering voice services should be ignored by voice capable GSM mobiles.

If successful registration is achieved, the MS indicates the selected PLMN.

If registration cannot be achieved because no PLMNs are available and allowable, the MS indicates "no service" to the user, waits until a new PLMN is available and allowable and then repeats the procedure.

If there were one or more PLMNs which were available and allowable, but an LR failure made registration on those PLMNs unsuccessful or an entry in a forbidden LAI list prevented a registration attempt, the MS selects the first such PLMN again and enters a limited service state.

4.4.3.1.2 Manual Network Selection Mode Procedure

The MS indicates whether there are any PLMNs, which are available using all supported access technologies. This includes "Forbidden PLMNs" and PLMNs which only offer services not supported by the MS. An MS which supports GSM COMPACT shall also indicate GSM COMPACT PLMNs (which use PBCCH).

If displayed, PLMNs meeting the criteria above are presented in the following order:

i)- HPLMN;

ii)- PLMNs contained in the " User Controlled PLMN Selector with Access Technology " data field in the SIM (in priority order);

iii)- PLMNs contained in the "Operator Controlled PLMN Selector with Access Technology" data field in the SIM (in priority order);

iv)- other PLMN/access technology combinations with received high quality signal in random order;

v)- other PLMN/access technology combinations in order of decreasing signal quality.

In ii and iii, an MS using a SIM without access technology information storage (i.e. the “User Controlled PLMN Selector with Access Technology” and the “Operator Controlled PLMN Selector with Access Technology” data fields are not present) shall instead present the PLMNs contained in the “PLMN Selector” data field in the SIM (in priority order).

In v, requirement h) in section 4.4.3.1.1 applies.

In A/Gb mode or GSM COMPACT, if a PLMN does not support voice services then this shall be indicated to the user.

The user may select his desired PLMN and the MS then initiates registration on this PLMN using the access technology chosen by the user for that PLMN or using the highest priority available access technology for that PLMN, if the associated access technologies have a priority order. (This may take place at any time during the presentation of PLMNs). For such a registration, the MS shall ignore the contents of the forbidden LAI and PLMN lists.

NOTE: It is an MS implementation option whether to indicate access technologies to the user. If the MS does display access technologies, then the access technology used should be the access technology chosen by the user for that PLMN. If the MS does not display access technologies, then the access technology chosen for a particular PLMN should be the highest priority available access technology for that PLMN, if the associated access technologies have a priority order.

If the user does not select a PLMN, the selected PLMN shall be the one that was selected before the PLMN selection procedure started. If no such PLMN was selected or that PLMN is no longer available, then the MS shall attempt to camp on any acceptable cell and enter the limited service state.

4.4.3.2 User reselection

At any time the user may request the MS to initiate reselection and registration onto an available PLMN, according to the following procedures, dependent upon the operating mode.

4.4.3.2.1 Automatic Network Selection Mode

The MS selects and attempts registration on PLMNs, if available and allowable, in all of its bands of operation in accordance with the following order:

i) HPLMN;

ii) PLMNs contained in the " User Controlled PLMN Selector with Access Technology" data field in the SIM (in priority order) excluding the previously selected PLMN;

iii) PLMNs contained in the "Operator Controlled PLMN Selector with Access Technology" data field in the SIM (in priority order) excluding the previously selected PLMN;

iv) other PLMN/access technology combinations with the received high quality signal in random order excluding the previously selected PLMN;

v) other PLMN/access technology combinations, excluding the previously selected PLMN in order of decreasing signal quality or, alternatively, the previously selected PLMN may be chosen ignoring its signal quality;

vi) The previously selected PLMN.

The previously selected PLMN is the PLMN which the MS has selected prior to the start of the user reselection procedure.

NOTE: If the previously selected PLMN is chosen, and registration has not been attempted on any other PLMNs, then the MS is already registered on the PLMN, and so registration is not necessary.

When following the above procedure the requirements a), b), c), e), f), g), h) in section 4.4.3.1.1 apply: Requirement d) shall apply as shown below:

d) In iv, v, and vi, the MS shall search for all access technologies it is capable of before deciding which PLMN to select.

4.4.3.2.2 Manual Network Selection Mode

The Manual Network Selection Mode Procedure of subclause 4.4.3.1.2 is followed.

3GPP TSG-CN1 Meeting #16 ***Tdoc N1-010486***
26 Feb. to 01 March 2001, Sophia France. **Revision of N1-010327**

CR-Form-v3

CHANGE REQUEST

⌘ **24.007** **CR** **034** ⌘ rev ⌘ Current version: **3.6.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network **X**

Title:	⌘	Transfer of the N(SD) duplication avoidance protocol from GSM 04.18
Source:	⌘	TSG_CN WG1
Work item code:	⌘	GSM/UMTS interworking ***Date:*** ⌘ 12/02/01
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(essential 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:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change: ⌘ The N(SD) duplication avoidance protocol applies to both UTRAN and GSM access. However today this protocol is specified in GSM 04.18 which is a GSM specification. This protocol should be described in a specification common for UTRAN and GSM access.

Also this protocol is between the MS and the MSC and is therefore a core network protocol and should be described in the core network specifications.

N1 sent a liaison (N1-001312) to GERAN WG2 to ask if the description could be moved from the GSM 04.18. GERAN WG2 replied in LS GP-010413 and the following text is quoted from this reply:

"On the issue, duplication avoidance protocol, TSG GERAN agrees that it is a core network function and it should be moved to the CN1 specifications. TSG GERAN has identified section 3.1.4.3 in 04.18 as the section to be moved to the CN1 specifications and will remove the section from 04.18 when the addition in CN1 specifications has been confirmed."

Summary of change: ⌘ This CR copy/pastes the section 3.1.4.3 from GSM 04.18 v8.7.0 to a new section 11.2.3.2.3. This CR also contains some editorial clarifications in the pasted text and in sections 11.2.3.2.1 and 11.2.3.2.2 . (different Word revision colors have been used to differentiate the original text pasted from GSM 04.18 and the subsequent changes that have been made)

Consequences if not approved: ⌘ The N(SD) duplication avoidance protocol is not decribed in the specification set for the case of a single mode UTRAN mobile.

Clauses affected: ⌘ 11.2.3.2.1, 11.2.3.2.2, 11.2.3.2.3 (new section)

Other specs ⌘ ☐ Other core specifications ⌘

affected:	☐ Test specifications ☐ O&M Specifications	
Other comments: ⌘		

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

11.2.3.2 Message type octet

11.2.3.2.1 Message type octet (when accessing Release 98 and older networks only)

The message type octet is the second in a standard L3 message.

When a standard L3 message is expected, and a message is received that is less than 16 bit long, that message shall be ignored.

When the radio connection started with a core network node of a Release 98 or older network, the message type IE is coded as shown in figure 11.10a.

Bit 8 is encoded as "0"; value "1" is reserved for possible future use as an extension bit. A protocol entity expecting a standard L3 message, and receiving a message containing bit 8 of octet 2 encoded as "1" shall diagnose a " message not defined for the PD" error and treat the message accordingly.

In messages of MM, CC, SS, GCC, BCC , TC (Test Control, see GSM 04.14 and TS 34.109) and LCS protocol sent using the transmission functionality provided by the RR layer to upper layers, and sent from the mobile station to the network , bit 7 of octet 2 is used ~~by the RR protocol~~ for send sequence number, see section 11.2.3.2.3.

In all other standard layer 3 messages bit 7 is set to a default value. A protocol entity expecting a standard L3 message, and not using the transmission functionality provided by the RR layer, and receiving a message containing bit 7 of octet 2 encoded different to the default value shall diagnose a "message not defined for the PD" error and treat the message accordingly.

The default value for bit 7 is 0 except for the SM protocol where the default value is 1.

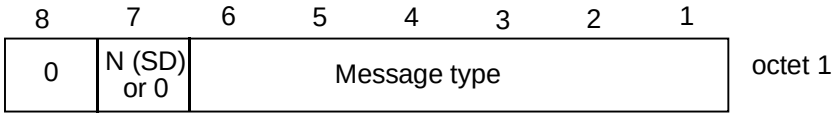

Figure 11.10a: Message type IE

Bit 1 to 6 of octet 2 of standard L3 messages contain the message type.

The message type determines the function of a message within a protocol in a given direction and for a given lower layer SAP. The meaning of the message type is therefore dependent on the protocol (the same value may have different meanings in different protocols), the direction (the same value may have different meanings in the same protocol, when sent from the Mobile Station to the network and when sent from the network to the Mobile Station) and the lower layer SAP (the same value may have different meanings, e.g., whether the message was sent on the SACCH or on the main DCCH).

Each protocol defines a list of allowed message types for each relevant SAP. A message received analysed as a standard L3 message, and with a message type not in the corresponding list leads to the diagnosis "message not defined for the PD". Some message types may correspond to a function not implemented by the receiver. They are then said to be non implemented by the receiver.

The reaction of a protocol entity expecting a standard L3 message and receiving a message with message type not defined for the PD or not implemented by the receiver and the reception conditions is defined in the relevant protocol specification. As a general rule, a protocol specification should not force the receiver to analyse the message further.

11.2.3.2.2 Message type octet (when accessing Release 99 and newer networks)

The message type octet is the second in a standard L3 message.

When a standard L3 message is expected, and a message is received that is less than 16 bit long, that message shall be ignored.

When the radio connection started with a core network node of a Release 99 network, the message type IE is coded as shown in figure 11.10b and 11.10c.

In messages of MM, CC, SS, GCC, BCC, TC (Test Control, see GSM 04.14 and TS 34.109) and ~~RRLP~~ LCS protocol sent using the transmission functionality provided by the RR and/or access stratum layer to upper layers, and sent from the mobile station to the network , bits 7 and 8 of octet 2 are used for send sequence number, see ~~GSM 04.18~~ section 11.2.3.2.3.

In all other standard layer 3 messages bits 7 and 8 are set to a default value. A protocol entity expecting a standard L3 message, and not using the transmission functionality provided by the RR and/or ~~RRC~~ access stratum layer, and receiving a message containing bit 7 or bit 8 of octet 2 encoded different to the default value shall diagnose a "message not defined for the PD" error and treat the message accordingly.

The default value for bit 8 is 0. The default value for bit 7 is 0 except for the SM protocol which has a default value of 1.

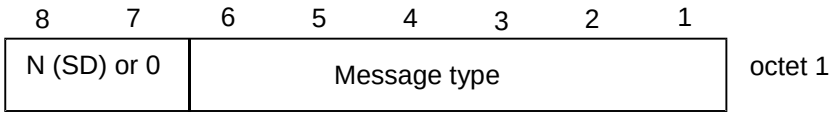

Figure 11.10b: Message type IE (MM, CC, SS, GCC, BCC, TC and ~~RRLP~~LCS)

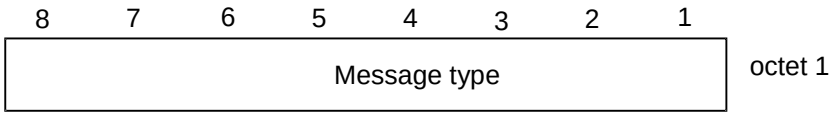

Figure 11.10c: Message type IE (protocol other than MM, CC, SS, GCC, BCC, TC and ~~RRLP~~LCS)

Bit 1 to 6 of octet 2 of standard L3 messages contain the message type.

The message type determines the function of a message within a protocol in a given direction and for a given lower layer SAP. The meaning of the message type is therefore dependent on the protocol (the same value may have different meanings in different protocols), the direction (the same value may have different meanings in the same protocol, when sent from the Mobile Station to the network and when sent from the network to the Mobile Station) and the lower layer SAP (the same value may have different meanings, e.g., whether the message was sent on the SACCH or on the main DCCH).

Each protocol defines a list of allowed message types for each relevant SAP. A message received analysed as a standard L3 message, and with a message type not in the corresponding list leads to the diagnosis "message not defined for the PD". Some message types may correspond to a function not implemented by the receiver. They are then said to be non implemented by the receiver.

The reaction of a protocol entity expecting a standard L3 message and receiving a message with message type not defined for the PD or not implemented by the receiver and the reception conditions is defined in the relevant protocol specification. As a general rule, a protocol specification should not force the receiver to analyse the message further.

11.2.3.2.3 Sequenced message transfer operation

Upper layer messages sent using the RR sub-layer transport service from the mobile station to the network can be duplicated by the data link layer in at least the following cases:

- in A/Gb mode, when a channel change of dedicated channels is required (assignment or handover procedure) and the last layer 2 frame has not been acknowledged by the peer data link layer before the mobile station leaves the old channel.
- in Iu mode, when an RLC re-establishment occurs (e.g. due to relocation) and the RLC layer has not acknowledged the last one or more RLC PDUs before RLC re-establishment
- ~~a channel change from UMTS to GSM is performed and the UMTS layer 2 protocol has not acknowleged the layer 2 frames carrying one or more upper layer messages.~~ an inter-system change from Iu mode to A/Gb mode is performed and the RLC layer has not acknowledged the last one or more RLC PDUs.

- an inter-system change from A/Gb mode to Iu mode is performed and the the last layer 2 frame in A/Gb mode has not been acknowledged by the peer data link layer before the mobile station leaves the old channel.

In these cases, the mobile station does not know whether the network has received the messages correctly. Therefore, the mobile station has to send the messages again when the channel change is completed. ~~after the new dedicated channel is established (see 3GPP TS 04.06).~~

The network must be able to detect the duplicated received messages. Therefore, each concerned upper layer messages must be marked with a send sequence number.

To allow for different termination points in the infrastructure of the messages of different PDs, the sequence numbering is specific to each PD. For historical reasons, an exception is that messages sent with the CC, SS and MM PDs share the same sequence numbering. In the following, the phrase **upper layer message flow** refers to a flow of messages sharing the same sequence numbering. The different upper layer flows are MM+CC+SS, GCC, BCC, TC (Test Control, see GSM 04.14 and TS 34.109) ,~~RRLP~~LCS ~~and GTTP~~. The GMM, SM and SMS protocols do not use layer 3 sequence numbering.

11.2.3.2.3.1 Variables and sequence numbers

11.2.3.2.3.1.1 Send state variable V(SD)

~~The RR (GSM case) and/or RRC (UMTS case) sublayer of the~~ The mobile station shall have one associated send state variable V(SD) ("Send Duplicated") for each upper layer message flow. The send state variable denotes the sequence number of the next in sequence numbered message in the flow to be transmitted. The value of the corresponding send state variable shall be incremented by one with each numbered message transmission. When the RR ~~or RRC~~ connection starts with a core network of release '98 or earlier arithmetic operations on V(SD) are performed modulo 2. When the RR ~~or RRC~~ connection starts with a core network of Release '99 or later, arithmetic operations on V(SD) are performed modulo 4. The mobile station shall keep using the same modulo (2 or 4) for the duration of the RR connection.

11.2.3.2.3.1.2 Send sequence number N(SD)

At the time when such a message to be numbered is designated for transmission, the value of N(SD) for the message to be transferred is set equal to the value of the send state variable V(SD). ~~See 3GPP TS 24.007.~~

11.2.3.2.3.2 Procedures for the initiation, transfer execution and termination of the sequenced message transfer operation

11.2.3.2.3.2.1 Initiation

The sequenced message transfer operation is initiated by establishing a RR connection. The send state variables V(SD) are set to 0.

11.2.3.2.3.2.2 Transfer Execution

A release '98 or earlier core network must compare the send sequence numbers of pairs of subsequent messages in the same upper layer messages flow. In case the send sequence numbers of two subsequent messages in a flow are not identical, no duplication has occurred. In case the send sequence numbers are identical, the network must ignore the second one of the received messages.

A release '99 or later core network shall discard any message whose N(SD) is not greater by one (modulo 4) than the N(SD) of the last accepted message.

11.2.3.2.3.2.3 Termination

The sequenced message transfer operation is terminated by the RR connection release procedure.

~~Handover from GSM to UMTS or from UMTS to GSM~~ Inter system change from A/Gb mode to Iu mode or from Iu mode to A/Gb mode shall not terminate the sequenced message transfer. UMTS SRNC relocation shall not terminate the sequenced message transfer.