3GPP TSG CT Meeting #28 **CP-050069**
1st – 3rd June 2005. Quebec, CANADA.

Source: **TSG CT WG1**

Title: **CRs to Rel-6 WI "TEI6" for TS 24.008**

Agenda item: **9.24**

Document for: **APPROVAL**

This document contains 8 **CR for Rel-6 WI "TEI6"**, that have been agreed by TSG CT WG1 meeting #38 and forwarded to TSG CT Plenary meeting #28 for approval.

TDoc #	Tdoc Title	Spec	CR #	Rev	CAT	C_Version	WI	Rel
C1-050779	Clarification on locking shift procedure	24.008	978	2	F	6.8.0	TEI6	Rel-6
C1-050548	MS initiated RAU for re-negotiation of MS configuration	24.008	975		F	6.8.0	TEI6	Rel-6
C1-050660	Extension of DTM to high multislot classes	24.008	989		C	6.8.0	TEI6	Rel-6
C1-050745	Corrections of designations and references of figures and tables	24.008	972	1	F	6.8.0	TEI6	Rel-6
C1-050747	Handling of duplicated RAU on the network side	24.008	973	1	F	6.8.0	TEI6	Rel-6
C1-050748	Cell Update triggered by low layers	24.008	974	1	F	6.8.0	TEI6	Rel-6
C1-050751	Mobile identity IE length when 'No identity'	24.008	984	1	F	6.8.0	TEI6	Rel-6
C1-050803	Attach type and Update type IEs	24.008	916	4	F	6.8.0	TEI6	Rel-6

3GPP TSG-CT1 Meeting #38
Cancun, Mexico, 25-29 April 2005

Tdoc C1-050548

CR-Form-v7.1

CHANGE REQUEST

⌘ **24.008** **CR** **975** ⌘ **rev** **-** ⌘ Current version: **6.8.0** ⌘

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

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

Title:	⌘	MS initiated RAU for re-negotiation of MS configuration
Source:	⌘	Infineon
Work item code:	⌘	TEI6
Date:	⌘	18/04/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

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

Use one of the following releases:

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

Reason for change:	⌘	It is unclear whether a RAU may be performed in order to re-negotiate the READY timer value. A re-negotiation may be necessary if a certain application requires a longer READY timer value in order to shorten the time for a network initiated DL of user data (e.g. Push to Talk).
Summary of change:	⌘	It is clarified, that the MS may trigger a RAU in order to re-negotiate the READY timer value.
Consequences if not approved:	⌘	Obscurity whether the MS may trigger a RAU in order to re-negotiate the READY timer value. Potential additional delay for DL data transfer.

Clauses affected:	⌘	4.7.5

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

Other comments: ⌘

4.7.5 Routing area updating procedure

This procedure is used for:

- normal routing area updating to update the registration of the actual routing area of an MS in the network. This procedure is used by GPRS MSs in MS operation mode C and by GPRS MSs in MS operation modes A or B that are IMSI attached for GPRS and non-GPRS services if the network operates in network operation mode II or III;

- combined routing area updating to update the registration of the actual routing and location area of an MS in the network. This procedure is used by GPRS MSs in MS operation modes A or B that are IMSI attached for GPRS and non-GPRS services provided that the network operates in network operation mode I;

- periodic routing area updating. This procedure is used by GPRS MSs in MS operation mode C and by GPRS MSs in MS operation modes A or B that are IMSI attached for GPRS or for GPRS and non-GPRS services independent of the network operation mode;

- IMSI attach for non-GPRS services when the MS is IMSI attached for GPRS services. This procedure is used by GPRS MSs in MS operation modes A or B, if the network operates in network operation mode I;

- in A/Gb mode, resuming GPRS services when the RR sublayer indicated a resumption failure after dedicated mode was left, see 3GPP TS 44.018 [84];

- in A/Gb mode, updating the network with the new MS Radio Access Capability IE when the content of the IE has changed;

- updating the network with the new DRX parameter IE when the content of the IE has changed;

NOTE 1: Such changes can be used e.g. when the MS activates a PDP context with service requirements that cannot be met with the current DRX parameter. As PDP context(s) are activated and deactivated, the GMM context will be updated with an appropriate DRX parameter;

- re-negotiation of the READY timer value;

- Iu mode to A/Gb mode and for A/Gb mode to Iu mode intersystem change, see subclause 4.7.1.7; or

- in Iu mode, to re-synchronize the PMM mode of MS and network after RRC connection release with cause "Directed signalling connection re-establishment", see subclause 4.7.2.5.

The routing area updating procedure shall also be used by a MS which is attached for GPRS services if a new PLMN is entered (see 3GPP TS 23.122 [14]).

Subclause 4.7.5.1 describes the routing area updating procedures for updating the routing area only. The combined routing area updating procedure used to update both the routing and location area is described in subclause 4.7.5.2.

The routing area updating procedure is always initiated by the MS. It is only invoked in state GMM-REGISTERED.

To limit the number of subsequently rejected routing area update attempts, a routing area updating attempt counter is introduced. The routing area updating attempt counter shall be incremented as specified in subclause 4.7.5.1.5. Depending on the value of the routing area updating attempt counter, specific actions shall be performed. The routing area updating attempt counter shall be reset when:

- a GPRS attach procedure is successfully completed; or

- a routing area updating procedure is successfully completed;

and additionally when the MS is in substate ATTEMPTING-TO-UPDATE:

- a new routing area is entered;

- expiry of timer T3302; or

- at request from registration function.

The mobile equipment shall contain a list of "forbidden location areas for roaming", as well as a list of "forbidden location areas for regional provision of service". The handling of these lists is described in subclause 4.4.1.

The Mobile Equipment shall contain a list of "equivalent PLMNs". The handling of this list is described in subclause 4.4.1.

In a shared network, the MS shall choose one of the PLMN identities as specified in 3GPP TS 23.122 [14]. The MS shall construct the Routing Area Identification of the cell from this chosen PLMN identity, and the LAC and the RAC received on the BCCH. If the constructed RAI is different from the stored RAI, the MS shall initiate the routing area updating procedure. The chosen PLMN identity shall be indicated to the RAN in the RRC INITIAL DIRECT TRANSFER message (see 3GPP TS 25.331 [23c]). Whenever a ROUTING AREA UPDATING REJECT message with the cause "PLMN not allowed" is received by the MS, the chosen PLMN identity shall be stored in the "forbidden PLMN list". Whenever a ROUTING AREA UPDATING REJECT message is received by the MS with the cause "Roaming not allowed in this location area", "Location Area not allowed", or "No suitable cells in Location Area", the constructed RAI which triggered the routing area updating procedure shall be stored in the suitable list.

In A/Gb mode, user data transmission in the MS shall be suspended during the routing area updating procedure; user data reception shall be possible. User data transmission in the network may be suspended during the routing area updating procedure.

In Iu mode, user data transmission and reception in the MS shall not be suspended during the routing area updating procedure. User data transmission in the network shall not be suspended during the routing area updating procedure.

In Iu mode, when a ROUTING AREA UPDATE REQUEST is received by the SGSN over a new PS signalling connection while there is an ongoing PS signalling connection (network is already in mode PMM-CONNECTED) for this UE, the network shall progress the routing area update procedure as normal and release the previous PS signalling connection when the routing area update procedure has been accepted by the network.

NOTE 2: The re-establishment of the radio bearers of active PDP contexts is done as described in subclause "Service Request procedure".

The network informs the MS about the support of specific features, such as LCS-MOLR, in the “Network feature support” Information Element. The information is either explicitly given by sending the “Network feature support” IE or implicitly by not sending it. The handling in the network is described in subclause 9.4.15.11. The MS may use the indication to inform the user about the availability of the appropriate services and it shall not request services that have not been indicated as available.

3GPP TSG-CT1 Meeting #38 **Tdoc C1-050660**
Cancun, Mexico, 25-29 April 2005

CR-Form-v7.1

CHANGE REQUEST

⌘ **24.008** **CR** **989** ⌘ **rev** **-** ⌘ Current version: **6.8.0** ⌘

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

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

Title:	⌘	Extension of DTM to high multislot classes
Source:	⌘	Siemens AG
Work item code:	⌘	TEI6
Date:	⌘	05/04/2005
Category:	⌘	**C**
Release:	⌘	Rel-6

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

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

Reason for change:	⌘	Extension of DTM beyond multislot class 11.
Summary of change:	⌘	Two new fields are included in the Classmark 3 and the MS RAC for the MS to signal to the network DTM for high multislot classes and, if so, which DTM multislot class.
Consequences if not approved:	⌘	Extension of DTM beyond multislot class 11 not possible.

Clauses affected:	⌘	10.5.1.7, 10.5.5.12a

	Y	N			
Other specs affected: ⌘	X		Other core specifications	⌘	43.055, 43.064, 44.060, 45.002
		X	Test specifications		
		X	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/specs/CR.htm.
Below is a brief summary:

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

10.5.1.7 Mobile Station Classmark 3

The purpose of the *Mobile Station Classmark 3* information element is to provide the network with information concerning aspects of the mobile station. The contents might affect the manner in which the network handles the operation of the mobile station. The Mobile Station Classmark information indicates general mobile station characteristics and it shall therefore, except for fields explicitly indicated, be independent of the frequency band of the channel it is sent on.

The *MS Classmark 3* is a type 4 information element with a maximum of 14 octets length.

The value part of a *MS Classmark 3* information element is coded as shown in figure 10.5.7/3GPP TS 24.008 and table 10.5.7/3GPP TS 24.008.

NOTE: The 14 octet limit is so that the CLASSMARK CHANGE message will fit in one layer 2 frame.

SEMANTIC RULE: a multiband mobile station shall provide information about all frequency bands it can support. A single band mobile station shall not indicate the band it supports in the *Multiband Supported, GSM 400 Bands Supported, GSM 700 Associated Radio Capability, GSM 850 Associated Radio Capability or GSM 1900 Associated Radio Capability* fields in the MS Classmark 3. Due to shared radio frequency channel numbers between GSM 1800 and GSM 1900, the mobile should indicate support for either GSM 1800 band OR GSM 1900 band.

SEMANTIC RULE: a mobile station shall include the MS Measurement Capability field if the *Multi Slot Class* field contains a value of 19 or greater (see 3GPP TS 45.002 [32]).

Typically, the number of spare bits at the end is the minimum to reach an octet boundary. The receiver may add any number of bits set to "0" at the end of the received string if needed for correct decoding.

<Classmark 3 Value part> ::=
< spare bit >
{ < Multiband supported : { 000 } >
< A5 bits >
| < Multiband supported : { 101 | 110 } >
< A5 bits >
< Associated Radio Capability 2 : bit(4) >
< Associated Radio Capability 1 : bit(4) >
| < Multiband supported : { 001 | 010 | 100 } >
< A5 bits >
< spare bit >(4)
< Associated Radio Capability 1 : bit(4) > }
{ 0 | 1 < R Support > }
{ 0 | 1 < HSCSD Multi Slot Capability > }
< UCS2 treatment: bit >
< Extended Measurement Capability : bit >
{ 0 | 1 < MS measurement capability > }
{ 0 | 1 < MS Positioning Method Capability > }
{ 0 | 1 < ECSD Multi Slot Capability > }
{ 0 | 1 < ECSD Struct > }
{ 0 | 1 < GSM 400 Bands Supported : { 01 | 10 | 11 } >
< GSM 400 Associated Radio Capability: bit(4) > }

{ 0 | 1 <GSM 850 Associated Radio Capability : bit(4) > }
{ 0 | 1 <GSM 1900 Associated Radio Capability : bit(4) > }
< UMTS FDD Radio Access Technology Capability : bit >
< UMTS 3.84 Mcps TDD Radio Access Technology Capability : bit >
< CDMA 2000 Radio Access Technology Capability : bit >

{ 0 | 1 < DTM GPRS Multi Slot Class : bit(2) >
< Single Slot DTM : bit >
{0 | 1< DTM EGPRS Multi Slot Class : bit(2) > } }
{ 0 | 1 < Single Band Support > } -- Release 4 starts here:
{ 0 | 1 <GSM 700 Associated Radio Capability : bit(4)>}

< UMTS 1.28 Mcps TDD Radio Access Technology Capability : bit >
< GERAN Feature Package 1 : bit >

{ 0 | 1 < Extended DTM GPRS Multi Slot Class : bit(2) >
< Extended DTM EGPRS Multi Slot Class : bit(2) > }

{ 0 | 1 < High Multislot Capability : bit(2) > } ---Release 5 starts here.

{ 0 | 1 < GERAN Iu Mode Capabilities > } -- *'1' also means support of GERAN Iu mode*
< GERAN Feature Package 2 : bit >

< GMSK Multislot Power Profile : bit (2) >
< 8-PSK Multislot Power Profile : bit (2) >

{ 0 | 1 < T-GSM 400 Bands Supported : { 01 | 10 | 11 } > *-- Release 6 starts here.*
< T-GSM 400 Associated Radio Capability: bit(4) > }

{ 0 | 1 < T-GSM 900 Associated Radio Capability: bit(4) > }
< Downlink Advanced Receiver Performance : bit (2)>

< DTM Enhancements Capability : bit >

{ 0 | 1 < DTM GPRS High Multi Slot Class : bit(3) >
< Offset required : bit>
{ 0 | 1 < DTM EGPRS High Multi Slot Class : bit(3) > } }

< spare bit > ;

< A5 bits > ::=
< A5/7 : bit > < A5/6 : bit > < A5/5 : bit > < A5/4 : bit > ;

```
<R Support>::=
    < R-GSM band Associated Radio Capability : bit(3) > ;

< HSCSD Multi Slot Capability > ::=
    < HSCSD Multi Slot Class : bit(5) >  ;

< MS Measurement capability > ::=
    < SMS_VALUE : bit (4) >
    < SM_VALUE : bit (4) > ;

< MS Positioning Method Capability > ::=
    < MS Positioning Method : bit(5) > ;

< ECSD Multi Slot Capability > ::=
    < ECSD Multi Slot Class : bit(5) > ;

 < ECSD Struct> : :=
    < Modulation Capability : bit >
    { 0 | 1 < EDGE RF Power Capability 1: bit(2) > }
    { 0 | 1 < EDGE RF Power Capability 2: bit(2) > }

< Single Band Support > ::=
    < GSM Band : bit (4) > ;

< GERAN Iu Mode Capabilities > ::=
    < Length : bit (4) >        -- length in bits of Iu mode only capabilities and spare bits
-- Additions in release 6
    < FLO Iu Capability : bit >
    <spare bits>** ;        -- expands to the indicated length
                            -- may be used for future enhancements
```

Figure 10.5.7/3GPP TS 24.008 *Mobile Station Classmark 3* information element

Table 10.5.7/3GPP TS 24.008: *Mobile Station Classmark 3* information element

Multiband Supported (3 bit field)

Band 1 supported
Bit 1
0 P-GSM not supported
1 P-GSM supported

Band 2 supported
Bit 2
0 E-GSM or R-GSM not supported
1 E-GSM or R-GSM supported

Band 3 supported
Bit 3
0 GSM 1800 not supported
1 GSM 1800 supported

The indication of support of P-GSM band or E-GSM or R-GSM band is mutually exclusive.

When the 'Band 2 supported' bit indicates support of E-GSM or R-GSM, the presence of the <R Support> field, see below, indicates if the E-GSM or R-GSM band is supported.

In this version of the protocol, the sender indicates in this field either none, one or two of these 3 bands supported.

For single band mobile station or a mobile station supporting none of the GSM 900 bands(P-GSM, E-GSM and R-GSM) and GSM 1800 bands, all bits are set to 0.

A5/4
0 Encryption algorithm A5/4 not available
1 Encryption algorithm A5/4 available

A5/5
0 Encryption algorithm A5/5 not available
1 Encryption algorithm A5/5 available

A5/6
0 Encryption algorithm A5/6 not available
1 Encryption algorithm A5/6 available

A5/7
0 Encryption algorithm A5/7 not available
1 Encryption algorithm A5/7 available

Associated Radio capability 1 and 2 (4 bit fields)

If either of P-GSM or E-GSM or R-GSM is supported, the radio capability 1 field indicates the radio capability for P-GSM, E-GSM or R-GSM, and the radio capability 2 field indicates the radio capability for GSM 1800 if supported, and is spare otherwise.

If none of P-GSM or E-GSM or R-GSM are supported, the radio capability 1 field indicates the radio capability for GSM 1800, and the radio capability 2 field is spare.

The radio capability contains the binary coding of the power class associated with the band indicated in multiband support bits (see 3GPP TS 45.005 [33]).

(continued...)

Table 10.5.1.7/3GPP TS 24.008 (continued): *MS Classmark 3* information element

R-GSM band Associated Radio Capability (3 bit field)

In case where the R-GSM band is supported the R-GSM band associated radio capability field contains the binary coding of the power class associated (see 3GPP TS 45.005) (regardless of the number of GSM bands supported). A mobile station supporting the R-GSM band shall also when appropriate, (see 10.5.1.6) indicate its support in the 'FC' bit in the Mobile Station Classmark 2 information element.

NOTE: The coding of the power class for P-GSM, E-GSM, R-GSM and GSM 1800 in radio capability 1 and/or 2 is different to that used in the Mobile Station Classmark 1 and Mobile Station Classmark 2 information elements.

HSCSD Multi Slot Class (5 bit field)

In case the MS supports the use of multiple timeslots for HSCSD then the HSCSD Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32].

UCS2 treatment (1 bit field)

This information field indicates the likely treatment by the mobile station of UCS2 encoded character strings. If not included, the value 0 shall be assumed by the receiver.

0 the ME has a preference for the default alphabet (defined in 3GPP TS 23.038 [8b]) over UCS2.
1 the ME has no preference between the use of the default alphabet and the use of UCS2.

Extended Measurement Capability (1 bit field)

This bit indicates whether the mobile station supports 'Extended Measurements' or not

0 the MS does not support Extended Measurements
1 the MS supports Extended Measurements

SMS_VALUE (Switch-Measure-Switch) (4 bit field)
The SMS field indicates the time needed for the mobile station to switch from one radio channel to another, perform a neighbour cell power measurement, and the switch from that radio channel to another radio channel.
Bits

4 3 2 1	
0 0 0 0	1/4 timeslot (~144 microseconds)
0 0 0 1	2/4 timeslot (~288 microseconds)
0 0 1 0	3/4 timeslot (~433 microseconds)
. . .	
1 1 1 1	16/4 timeslot (~2307 microseconds)

SM_VALUE (Switch-Measure) (4 bit field)
The SM field indicates the time needed for the mobile station to switch from one radio channel to another and perform a neighbour cell power measurement.
Bits

4 3 2 1	
0 0 0 0	1/4 timeslot (~144 microseconds)
0 0 0 1	2/4 timeslot (~288 microseconds)
0 0 1 0	3/4 timeslot (~433 microseconds)
. . .	
1 1 1 1	16/4 timeslot (~2307 microseconds)

MS Positioning Method (5 bit field)
This field indicates the Positioning Method(s) supported by the mobile station for the provision of location services (LCS) via the CS domain in A-mode.
MS assisted E-OTD
Bit 5

0 MS assisted E-OTD not supported
1 MS assisted E-OTD supported

Table 10.5.1.7/3GPP TS 24.008 (continued): *MS Classmark 3* information element

MS based E-OTD
Bit 4
0 MS based E-OTD not supported
1 MS based E-OTD supported

MS assisted GPS
Bit 3
0 MS assisted GPS not supported
1 MS assisted GPS supported

MS based GPS
Bit 2
0 MS based GPS not supported
1 MS based GPS supported

MS Conventional GPS
Bit 1
0 conventional GPS not supported
1 conventional GPS supported

ECSD Multi Slot class (5 bit field)

In case the **ECSD** MS supports the use of multiple timeslots and the number of supported time slots is different from number of time slots supported for GMSK then the **ECSD** Multi Slot class field is included and is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32].

Modulation Capability

The Modulation Capability field indicates the modulation scheme the MS supports in addition to GMSK.
0 8-PSK supported for downlink reception only
1 8-PSK supported for uplink transmission and downlink reception

EDGE RF Power Capability 1 (2 bit field)
If 8-PSK modulation is supported for both uplink and downlink, the **EDGE RF Power Capability 1** field indicates the radio capability for 8-PSK modulation in GSM 400, GSM 700, GSM 850 or GSM 900.

EDGE RF Power Capability 2 (2 bit field)
If 8-PSK modulation is supported for both uplink and downlink, the **EDGE RF Power Capability 2** field indicates the radio capability for 8-PSK modulation in GSM 1800 or GSM 1900 if supported, and is not included otherwise.

The respective **EDGE RF Power Capability 1** and **EDGE RF Power Capability 2** fields contain the following coding of the 8-PSK modulation power class (see 3GPP TS 45.005 [33]):

Bits 2 1	
0 0	Reserved
0 1	Power class E1
1 0	Power class E2
1 1	Power class E3

Table 10.5.1.7/3GPP TS 24.008 (continued): *MS Classmark 3* information element

GSM 400 Bands Supported (2 bit field)
See the semantic rule for the sending of this field.
Bits

2	1	
0	1	GSM 480 supported, GSM 450 not supported
1	0	GSM 450 supported, GSM 480 not supported
1	1	GSM 450 supported, GSM 480 supported

GSM 400 Associated Radio Capability (4 bit field)
If either GSM 450 or GSM 480 or both is supported, the GSM 400 Associated Radio Capability field indicates the radio capability for GSM 450 and/or GSM 480.

The radio capability contains the binary coding of the power class associated with the band indicated in GSM 400 Bands Supported bits (see 3GPP TS 45.005 [33]).

NOTE: The coding of the power class for GSM 450 and GSM 480 in GSM 400 Associated Radio Capability is different to that used in the Mobile Station Classmark 1 and Mobile Station Classmark 2 information elements.

GSM 850 Associated Radio Capability (4 bit field)
See the semantic rule for the sending of this field.
This field indicates whether GSM 850 band is supported and its associated radio capability.

The radio capability contains the binary coding of the power class associated with the GSM 850 band (see 3GPP TS 45.005 [33]).

Note: the coding of the power class for GSM 850 in GSM 850 Associated Radio Capability is different to that used in the Mobile Station Classmark 1 and Mobile Station Classmark 2 information elements.

GSM 1900 Associated Radio Capability (4 bit field)
See the semantic rule for the sending of this field.
This field indicates whether GSM 1900 band is supported and its associated radio capability.

The radio capability contains the binary coding of the power class associated with the GSM 1900 band (see 3GPP TS 45.005 [33]).

Note: the coding of the power class for GSM 1900 in GSM 1900 Associated Radio Capability is different to that used in the Mobile Station Classmark 1 and Mobile Station Classmark 2 information elements.

Table 10.5.1.7/3GPP TS 24.008 (continued): *MS Classmark 3* information element

UMTS FDD Radio Access Technology Capability (1 bit field)
0 UMTS FDD not supported
1 UMTS FDD supported

UMTS 3.84 Mcps TDD Radio Access Technology Capability (1 bit field)
0 UMTS 3.84 Mcps TDD not supported
1 UMTS 3.84 Mcps TDD supported

CDMA 2000 Radio Access Technology Capability (1 bit field)
0 CDMA2000 not supported
1 CDMA2000 supported

DTM GPRS Multi Slot Class (2 bit field)
This field indicates the DTM GPRS multislot capabilities of the MS. It is coded as follows:
Bit
2 1
0 0 Unused. If received, the network shall interpret this as '01'
0 1 Multislot class 5 supported
1 0 Multislot class 9 supported
1 1 Multislot class 11 supported

If a multislot class type 1 MS indicates the support of a DTM GPRS multislot class for which three uplink timeslots can be assigned, the mobile station shall support Extended Dynamic Allocation.

This field shall contain one of the following values if the *DTM GPRS High Multi Slot Class* field is present:

- Multislot class 9 if DTM GPRS High Multi Slot Class is set to indicate Class 31/36 or Class 41;
- Multislot class 11 if DTM GPRS High Multi Slot Class is set to indicate Classes 32/37, 33/38 or Classes 42, 43, 44.

Single Slot DTM (1 bit field)
This field indicates whether the MS supports single slot DTM operation (see 3GPP TS 43.055 [87]). It is coded as follows:

0 Single Slot DTM not supported
1 Single Slot DTM supported

An MS indicating support for Extended DTM GPRS multislot class or Extended DTM EGPRS multislot class shall set this bit to '1'. The network may ignore the bit in this case.

DTM EGPRS Multi Slot Class (2 bit field)
This field indicates the DTM EGPRS multislot capabilities of the MS. This field shall be included only if the mobile station supports EGPRS DTM. This field is coded as the DTM GPRS Multi Slot Class field.

If a multislot class type 1 MS indicates the support of a DTM EGPRS multislot class for which three uplink timeslots can be assigned, the mobile station shall support Extended Dynamic Allocation.

This field shall contain one of the following values if the *DTM EGPRS High Multi Slot Class* field is present:

- Multislot class 9 if DTM EGPRS High Multi Slot Class is set to indicate Class 31/36 or Class 41;
- Multislot class 11 if DTM EGPRS High Multi Slot Class is set to indicate Classes 32/37, 33/38 or Classes 42, 43, 44.

Single Band Support
This field shall be sent if the mobile station supports UMTS and one and only one GSM band with the exception of R-GSM; this field shall not be sent otherwise

GSM Band (4 bit field)
Bits
4 3 2 1
0 0 0 0 E-GSM is supported
0 0 0 1 P-GSM is supported
0 0 1 0 GSM 1800 is supported
0 0 1 1 GSM 450 is supported
0 1 0 0 GSM 480 is supported
0 1 0 1 GSM 850 is supported
0 1 1 0 GSM 1900 is supported

0 1 1 1 GSM 700 is supported
All other values are reserved for future use.

NOTE: When this field is received, the associated RF power capability is found in Classmark 1 or 2.

GSM 700 Associated Radio Capability (4 bit field)

See the semantic rule for the sending of this field.
This field indicates whether GSM 700 band is supported and its associated radio capability.

The radio capability contains the binary coding of the power class associated with the GSM 700 band (see 3GPP TS 45.005 [33]).

NOTE: The coding of the power class for GSM 700 in GSM 700 Associated Radio Capability is different to that used in the Mobile Station Classmark 1 and Mobile Station Classmark 2 information elements.

UMTS 1.28 Mcps TDD Radio Access Technology Capability (1 bit field)
0 UMTS 1.28 Mcps TDD not supported
1 UMTS 1.28 Mcps TDD supported

GERAN Feature Package 1 (1 bit field)
This field indicates whether the MS supports the GERAN Feature Package 1 (see 3GPP TS 44.060). It is coded as follows:

0 GERAN feature package 1 not supported.
1 GERAN feature package 1 supported.

Extended DTM GPRS Multi Slot Class (2 bit field)
This field indicates the extended DTM GPRS multislot capabilities of the MS and shall be interpreted in conjunction with the DTM GPRS Multi Slot Class field. It is coded as follows, where 'DGMSC' denotes the DTM GPRS Multi Slot Class field:

DGMSC Bit 2 1	Bit 2 1	
0 0	0 0	Unused. If received, it shall be interpreted as '01 00'
0 0	0 1	Unused. If received, it shall be interpreted as '01 00'
0 0	1 0	Unused. If received, it shall be interpreted as '01 00'
0 0	1 1	Unused. If received, it shall be interpreted as '01 00'
0 1	0 0	Multislot class 5 supported
0 1	0 1	Multislot class 6 supported
0 1	1 0	Unused. If received, it shall be interpreted as '01 00'
0 1	1 1	Unused. If received, it shall be interpreted as '01 00'
1 0	0 0	Multislot class 9 supported
1 0	0 1	Multislot class 10 supported
1 0	1 0	Unused. If received, it shall be interpreted as '10 00'
1 0	1 1	Unused. If received, it shall be interpreted as '10 00'
1 1	0 0	Multislot class 11 supported
1 1	0 1	Unused. If received, it shall be interpreted as '11 00'
1 1	1 0	Unused. If received, it shall be interpreted as '11 00'
1 1	1 1	Unused. If received, it shall be interpreted as '11 00'

The presence of this field indicates that the MS supports combined fullrate and halfrate GPRS channels in the downlink.When this field is not present, the MS supports the multislot class indicated by the *DTM GPRS Multi Slot Class field*.

If this field is included, it shall contain one of the following values if the *DTM GPRS High Multi Slot Class* field is present:

- Multislot class 10 if DTM GPRS High Multi Slot Class is set to indicate Class 31/36 or Class 41;
- Multislot class 11 if DTM GPRS High Multi Slot Class is set to indicate Classes 32/37, 33/38 or Classes 42, 43, 44.

Extended DTM EGPRS Multi Slot Class (2 bit field)
This field is not considered when the DTM EGPRS Multi Slot Class field is not included. This field indicates the extended DTM EGPRS multislot capabilities of the MS and shall be interpreted in conjunction with the DTM EGPRS Multi Slot Class field. This field is coded as the Extended DTM GPRS Multi Slot Class field. The presence of this field indicates that the MS supports combined fullrate and halfrate GPRS channels in the downlink. When this field is not present, the MS supports the multislot class indicated by the *DTM EGPRS Multi Slot Class* field.

If this field is included, it shall contain one of the following values if the *DTM EGPRS High Multi Slot Class* field is present:

- Multislot class 10 if DTM EGPRS High Multi Slot Class is set to indicate Class 31/36 or Class 41;
- Multislot class 11 if DTM EGPRS High Multi Slot Class is set to indicate Classes 32/37, 33/38 or Classes 42, 43, 44.

High Multislot Capability (2 bit field)
This field indicates the support of multislot classes 30 to 45, see 3GPP TS 45.002.
The High Multislot Capability is individually combined with each multislot class field sent by the MS (the possible multislot class fields are: ~~HSCSD multislot class, ECSD multislot class,~~ GPRS multislot class, EGPRS multislot class~~, DTM GPRS multislot class, DTM EGPRS multislot class, extended DTM GPRS multislot class and extended DTM EGPRS multislot class~~) to extend the related multislot class with the rule described in the MS Radio Access Capability IE.

GERAN Iu Mode Capabilities
This field indicates if the mobile station supports GERAN Iu mode. Furthermore, it indicates the GERAN Iu mode capabilities of the mobile station. The field shall be included if the mobile station supports GERAN Iu mode. If the field is not present, the mobile station does not support GERAN Iu mode.

NOTE: The coding of the power class for T-GSM 410 and T-GSM 380 in T-GSM 400 Associated Radio Capability is different to that used in the Mobile Station Classmark 1 and Mobile Station Classmark 2 information elements.

T-GSM 900 Associated Radio Capability (4 bit field)
See the semantic rule for the sending of this field.
This field indicates whether T-GSM 900 band is supported and its associated radio capability.

The radio capability contains the binary coding of the power class associated with the T-GSM 900 band (see 3GPP TS 45.005 [33]).

Note: the coding of the power class for T-GSM 900 in T-GSM 900 Associated Radio Capability is different to that used in the Mobile Station Classmark 1 and Mobile Station Classmark 2 information elements.

respectively if the *Offset required* field indicates that the Timing Advance offset t_0 is required; in all other cases those codepoints shall be interpreted as indicating DTM EGPRS multislot class 31, 32 or 33 respectively.

****** next modifies subclause ******

10.5.5.12a MS Radio Access capability

The purpose of the *MS RA capability* information element is to provide the radio part of the network with information concerning radio aspects of the mobile station. The contents might affect the manner in which the network handles the operation of the mobile station.

The *MS RA capability* is a type 4 information element, with a maximum length of 52 octets.

The value part of a *MS RA capability* information element is coded a shown table 10.5.146/3GPP TS 24.008.

For the indication of the radio access capabilities the following conditions shall apply:

- Among the three Access Type Technologies GSM 900-P, GSM 900-E and GSM 900-R only one shall be present.
- Due to shared radio frequency channel numbers between GSM 1800 and GSM 1900, the mobile station should provide the relevant radio access capability for either GSM 1800 band OR GSM 1900 band, not both.
- The MS shall indicate its supported Access Technology Types during a single MM procedure.
- If the alternative coding by using the Additional access technologies struct is chosen by the mobile station, the mobile station shall indicate its radio access capability for the serving BCCH frequency band in the first included Access capabilities struct, if this information element is not sent in response to an Access Technologies Request from the network or if none of the requested Access Technology Types is supported by the MS. Otherwise, the mobile station shall include the radio access capabilities for the frequency bands it supports in the order of priority requested by the network (see 3GPP TS 44.060).
- The first Access Technology Type shall not be set to "1111".

For error handling the following shall apply:

– If a received Access Technology Type is unknown to the receiver, it shall ignore all the corresponding fields.

– If within a known Access Technology Type a receiver recognizes an unknown field it shall ignore it.

– For more details about error handling of MS radio access capability see 3GPP TS 48.018 [86].

Table 10.5.146/3GPP TS 24.008: *Mobile Station Radio Access Capability* Information Element

<**MS RA capability value part** : < MS RA capability value part struct >>
<spare bits>**; -- *may be used for future enhancements*

<MS RA capability value part struct >::= --*recursive structure allows any number of Access technologies*
{ { < **Access Technology Type**: bit (4) > exclude 1111
< **Access capabilities** : <Access capabilities struct> > }

| { < **Access Technology Type**: bit (4) == 1111 > -- *structure adding Access technologies with same capabilities*
< **Length** : bit (7) > -- *length in bits of list of Additional access technologies and spare bits*
{ 1 < **Additional access technologies**: < Additional access technologies struct > > } ** 0
<spare bits>** } }

{ 0 | 1 <MS RA capability value part struct> } ;

< Additional access technologies struct > ::=
< **Access Technology Type** : bit (4) >
< **GMSK Power Class** : bit (3) >
< **8PSK Power Class** : bit (2) > ;

< Access capabilities struct > ::=
< **Length** : bit (7) > -- length in bits of Content and spare bits
<Access capabilities : <Content>>
<spare bits>** ; -- expands to the indicated length
-- may be used for future enhancements

< Content > ::=
< **RF Power Capability** : bit (3) >
{ 0 | 1 <**A5 bits** : <A5 bits> > } -- *zero means that the same values apply for parameters as in the immediately preceding Access capabilities field within this IE*
< **ES IND** : bit >
< **PS** : bit >
< **VGCS** : bit >
< **VBS** : bit >
{ 0 | 1 < **Multislot capability** : Multislot capability struct > } -- *zero means that the same values for multislot parameters as given in an earlier Access capabilities field within this IE apply also here*
-- *Additions in release 99*
{ 0 | 1 < **8PSK Power Capability** : bit(2) >} -- *'1' also means 8PSK modulation capability in uplink.*
< **COMPACT Interference Measurement Capability : bit >**
< **Revision Level Indicator** : bit >
< **UMTS FDD Radio Access Technology Capability** : bit > -- *3G RAT*
< **UMTS 3.84 Mcps TDD Radio Access Technology Capability** : bit > -- *3G RAT*
< **CDMA 2000 Radio Access Technology Capability** : bit > -- *3G RAT*
-- *Additions in release 4*
< **UMTS 1.28 Mcps TDD Radio Access Technology Capability**: bit > -- *3G RAT*
< **GERAN Feature Package 1** : bit >
{ 0 | 1 < **Extended DTM GPRS Multi Slot Class** : bit(2) >
< **Extended DTM EGPRS Multi Slot Class** : bit(2) > }
< Modulation based multislot class support : bit >
-- *Additions in release 5*
{ 0 | 1 < **High Multislot Capability** : bit(2) > }
{ 0 | 1 < **GERAN Iu Mode Capabilities** > } -- *'1' also means support of GERAN Iu mode*
< **GMSK Multislot Power Profile** : bit (2) >
< **8-PSK Multislot Power Profile** : bit (2) >
-- *Additions in release 6*
< **Multiple TBF Capability** : bit >
< **Downlink Advanced Receiver Performance** : bit(2) >
< **Extended RLC/MAC Control Message Segmentation Capability** : bit >
< **DTM Enhancements Capability** : bit >
{ 0 | 1 < **DTM GPRS High Multi Slot Class** : bit(3) >

```
        { 0 | 1 < DTM EGPRS High Multi Slot Class : bit(3) > } };
    -- error: struct too short, assume features do not exist
    -- error: struct too long, ignore data and jump to next Access technology
```

Table 10.5.146/3GPP TS 24.008 (continued): *Mobile Station Radio Access Capability* IE

< Multislot capability struct > ::=
{ 0 | 1 < **HSCSD multislot class** : bit (5) > }
{ 0 | 1 < **GPRS multislot class** : bit (5) > < **GPRS Extended Dynamic Allocation Capability** : bit > }
{ 0 | 1 < **SMS_VALUE** : bit (4) > < **SM_VALUE** : bit (4) > }
-- *Additions in release 99*
{ 0 | 1 < **ECSD multislot class** : bit (5) > }
{ 0 | 1 < **EGPRS multislot class** : bit (5) > < **EGPRS Extended Dynamic Allocation –Capability** : bit > }
{0 | 1 < **DTM GPRS Multi Slot Class**: bit(2)>
<Single Slot DTM : bit>
{0 | 1 <**DTM EGPRS Multi Slot Class** : bit(2)> } } ;
-- error: struct too short, assume features do not exist

< **GERAN Iu Mode Capabilities** > ::=
< **Length** : bit (4) > -- *length in bits of Iu mode-only capabilities and spare bits*
-- *Additions in release 6*
< **FLO Iu Capability** : bit >
<spare bits>** ; -- *expands to the indicated length*
-- *may be used for future enhancements*

<A5 bits> ::= < A5/1 : bit> <A5/2 : bit> <A5/3 : bit> <A5/4 : bit> <A5/5 : bit> <A5/6 : bit> <A5/7 : bit>; -- bits for circuit mode ciphering algorithms. These fields are not used by the network and may be excluded by the MS.

Access Technology Type
This field indicates the access technology type to be associated with the following access capabilities.

Bits
4 3 2 1
0 0 0 0 GSM P
0 0 0 1 GSM E --*note that GSM E covers GSM P*
0 0 1 0 GSM R --*note that GSM R covers GSM E and GSM P*
0 0 1 1 GSM 1800
0 1 0 0 GSM 1900
0 1 0 1 GSM 450
0 1 1 0 GSM 480
0 1 1 1 GSM 850
1 0 0 0 GSM 700
1 0 0 1 GSM T 380
1 0 1 0 GSM T 410
1 0 1 1 GSM T 900
1 1 1 1 Indicates the presence of a list of Additional access technologies
All other values are treated as unknown by the receiver.

A MS which does not support any GSM access technology type shall set this field to '0000'.

RF Power Capability, GMSK Power Class (3 bit field)
This field contains the binary coding of the power class used for GMSK associated with the indicated Access Technology Type (see 3GPP TS 45.005).

A MS which does not support any GSM access technology type shall set this field to '000'.

8PSK Power Capability (2 bit field)
If 8-PSK modulation is supported for uplink, this field indicates the radio capability for 8-PSK modulation. The following coding is used (see 3GPP TS 45.005 [33]):
Bits 2 1
0 0 Reserved
0 1 Power class E1
1 0 Power class E2
1 1 Power class E3

8PSK Power Class (2 bit field)
This field indicates the radio capability for 8-PSK modulation. The following coding is used (see 3GPP TS 45.005):
Bits 2 1
0 0 8PSK modulation not supported for uplink
0 1 Power class E1
1 0 Power class E2

1 1 Power class E3

Additional access technologies struct
This structure contains the GMSK Power Class and 8PSK Power Class for an additional Access Technology. All other capabilities for this indicated Access Technology are the same as the capabilities indicated by the preceding Access capabilities struct.

A5/1
0 encryption algorithm A5/1 not available
1 encryption algorithm A5/1 available
A5/2
0 encryption algorithm A5/2 not available
1 encryption algorithm A5/2 available
A5/3
0 encryption algorithm A5/3 not available
1 encryption algorithm A5/3 available
A5/4
0 encryption algorithm A5/4 not available
1 encryption algorithm A5/4 available
A5/5
0 encryption algorithm A5/5 not available
1 encryption algorithm A5/5 available
A5/6
0 encryption algorithm A5/6 not available
1 encryption algorithm A5/6 available
A5/7
0 encryption algorithm A5/7 not available
1 encryption algorithm A5/7 available

ES IND – (Controlled early Classmark Sending)
0 "controlled early Classmark Sending" option is not implemented
1 "controlled early Classmark Sending" option is implemented

Table 10.5.146/3GPP TS 24.008 (concluded): *Mobile Station Radio Access Capability* IE

PS – (Pseudo Synchronisation)
0 PS capability not present
1 PS capability present

VGCS – (Voice Group Call Service)
0 no VGCS capability or no notifications wanted
1 VGCS capability and notifications wanted.

VBS – (Voice Broadcast Service)
0 no VBS capability or no notifications wanted
1 VBS capability and notifications wanted

HSCSD Multi Slot Class
The Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32]. This field is not used by the network and may be excluded by the MS.
Range 1 to 18, all other values are reserved.

GPRS Multi Slot Class
The GPRS Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32].

ECSD Multi Slot Class
The presence of this field indicates ECSD capability. Whether the MS is capable of 8-PSK modulation in uplink is indicated by the presence of 8-PSK Power Capability field. The Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32]. This field is not used by the network and may be excluded by the MS.
Range 1 to 18, all other values are reserved.

EGPRS Multi Slot Class
The presence of this field indicates EGPRS capability. Whether the MS is capable of 8-PSK modulation in uplink is indicated by the presence of 8-PSK Power Capability field. The EGPRS Multi Slot Class field is coded as the binary representation of the multislot class defined in 3GPP TS 45.002 [32].

GPRS Extended Dynamic Allocation Capability
0 Extended Dynamic Allocation Capability for GPRS is not implemented
1 Extended Dynamic Allocation Capability for GPRS is implemented

If a multislot class type 1 MS indicates in the GPRS Multi Slot Class field the support of a multislot class for which three or more uplink timeslots can be assigned, Extended Dynamic Allocation for GPRS shall be implemented in the mobile station.

EGPRS Extended Dynamic Allocation Capability
0 Extended Dynamic Allocation Capability for EGPRS is not implemented
1 Extended Dynamic Allocation Capability for EGPRS is implemented

If a multislot class type 1 MS indicates in the EGPRS Multi Slot Class field the support of a multislot class for which three or more uplink timeslots can be assigned, Extended Dynamic Allocation for EGPRS shall be implemented in the mobile station.

SMS_VALUE (Switch-Measure-Switch) (4 bit field)
The SMS field indicates the time needed for the mobile station to switch from one radio channel to another, perform a neighbor cell power measurement, and the switch from that radio channel to another radio channel. This field is not used by the network and may be excluded by the MS.
Bits
4 3 2 1
0 0 0 0 1/4 timeslot (~144 microseconds)
0 0 0 1 2/4 timeslot (~288 microseconds)
0 0 1 0 3/4 timeslot (~433 microseconds)
. . .
1 1 1 1 16/4 timeslot (~2307 microseconds)

(SM_VALUE) Switch-Measure (4 bit field)
The SM field indicates the time needed for the mobile station to switch from one radio channel to another and perform a neighbour cell power measurement. This field is not used by the network and may be excluded by the MS.
Bits
4 3 2 1

0 0 0 0	1/4 timeslot (~144 microseconds)
0 0 0 1	2/4 timeslot (~288 microseconds)
0 0 1 0	3/4 timeslot (~433 microseconds)
. . .	
1 1 1 1	16/4 timeslot (~2307 microseconds)

DTM GPRS Multi Slot Class (2 bit field)
This field indicates the DTM GPRS multislot capabilities of the MS. It is coded as follows:

Bits 2 1	
0 0	Unused. If received, the network shall interpret this as '01'
0 1	Multislot class 5 supported
1 0	Multislot class 9 supported
1 1	Multislot class 11 supported

This field shall contain one of the following values if the *DTM GPRS High Multi Slot Class* field is present:

- Multislot class 9 if DTM GPRS High Multi Slot Class is set to indicate Class 31/36 or Class 41;
- Multislot class 11 if DTM GPRS High Multi Slot Class is set to indicate Classes 32/37, 33/38 or Classes 42, 43, 44.

Single Slot DTM (1 bit field)
This field indicates whether the MS supports single slot DTM operation (see 3GPP TS 43.055 [87]).

Bit	
0	Single Slot DTM not supported
1	Single Slot DTM supported

An MS indicating support for Extended DTM GPRS multislot class or Extended DTM EGPRS multislot class shall set this bit to '1'. The network may ignore the bit in this case.

DTM EGPRS Multi Slot Class (2 bit field)
This field indicates the DTM EGPRS multislot capabilities of the MS. This field shall be included only if the mobile station supports EGPRS DTM. This field is coded as the DTM GPRS multislot Class field.

This field shall contain one of the following values if the *DTM EGPRS High Multi Slot Class* field is present:

- Multislot class 9 if DTM EGPRS High Multi Slot Class is set to indicate Class 31/36 or Class 41;
- Multislot class 11 if DTM EGPRS High Multi Slot Class is set to indicate Classes 32/37, 33/38 or Classes 42, 43, 44.

COMPACT Interference Measurement Capability (1 bit field)

0	COMPACT Interference Measurement Capability is not implemented
1	COMPACT Interference Measurement Capability is implemented

Revision Level Indicator (1 bit field)

Bit	
0	The ME is Release '98 or older
1	The ME is Release '99 onwards

UMTS FDD Radio Access Technology Capability (1 bit field)

Bit	
0	UMTS FDD not supported
1	UMTS FDD supported

UMTS 3.84 Mcps TDD Radio Access Technology Capability (1 bit field)

Bit	
0	UMTS 3.84 Mcps TDD not supported
1	UMTS 3.84 Mcps TDD supported

CDMA 2000 Radio Access Technology Capability (1 bit field)

Bit	
0	CDMA 2000 not supported
1	CDMA 2000 supported

UMTS 1.28 Mcps TDD Radio Access Technology Capability (1 bit field)
Bit

0 UMTS 1.28 Mcps TDD not supported
1 UMTS 1.28 Mcps TDD supported

GERAN Feature Package 1 (1 bit field)
This field indicates whether the MS supports the GERAN Feature Package 1 (see 3GPP TS 44.060). It is coded as follows:

0 GERAN feature package 1 not supported.
1 GERAN feature package 1 supported.

Extended DTM GPRS Multi Slot Class (2 bit field)
This field indicates the extended DTM GPRS capabilities of the MS and shall be interpreted in conjunction with the DTM GPRS Multi Slot Class field. It is coded as follows, where 'DGMSC' denotes the DTM GPRS multislot class field:

DGMSC Bit	2 1	**Bit 2 1**	
	0 0	**0 0**	Unused. If received, it shall be interpreted as '01 00'
	0 0	**0 1**	Unused. If received, it shall be interpreted as '01 00'
	0 0	**1 0**	Unused. If received, it shall be interpreted as '01 00'
	0 0	**1 1**	Unused. If received, it shall be interpreted as '01 00'
	0 1	**0 0**	Multislot class 5 supported
	0 1	**0 1**	Multislot class 6 supported
	0 1	**1 0**	Unused. If received, it shall be interpreted as '01 00'
	0 1	**1 1**	Unused. If received, it shall be interpreted as '01 00'
	1 0	**0 0**	Multislot class 9 supported
	1 0	**0 1**	Multislot class 10 supported
	1 0	**1 0**	Unused. If received, it shall be interpreted as '10 00'
	1 0	**1 1**	Unused. If received, it shall be interpreted as '10 00'
	1 1	**0 0**	Multislot class 11 supported
	1 1	**0 1**	Unused. If received, it shall be interpreted as '11 00'
	1 1	**1 0**	Unused. If received, it shall be interpreted as '11 00'
	1 1	**1 1**	Unused. If received, it shall be interpreted as '11 00'

The presence of this field indicates that the MS supports combined fullrate and halfrate GPRS channels in the downlink. When this field is not present, the MS supports the multislot class indicated by the *DTM GPRS Multi Slot Class* field.

If this field is included, it shall contain one of the following values if the *DTM GPRS High Multi Slot Class* field is present:

- Multislot class 10 if DTM GPRS High Multi Slot Class is set to indicate Class 31/36 or Class 41;
- Multislot class 11 if DTM GPRS High Multi Slot Class is set to indicate Classes 32/37, 33/38 or Classes 42, 43, 44.

Extended DTM EGPRS Multislot Class (2 bit field)
This field is not considered when the DTM EGPRS Multislot Class field is not included. This field indicates the extended DTM EGPRS multislot capabilities of the MS and shall be interpreted in conjunction with the DTM EGPRS Multislot Class field. This field is coded as the Extended DTM GPRS Multislot Class field. The presence of this field indicates that the MS supports combined fullrate and halfrate GPRS channels in the downlink. When this field is not present, the MS supports the multislot class indicated by the DTM EGPRS Multi Slot Class field.

If this field is included, it shall contain one of the following values if the *DTM EGPRS High Multi Slot Class* field is present:

- Multislot class 10 if DTM EGPRS High Multi Slot Class is set to indicate Class 31/36 or Class 41;
- Multislot class 11 if DTM EGPRS High Multi Slot Class is set to indicate Classes 32/37, 33/38 or Classes 42, 43, 44.

Modulation based multislot class support (1 bit field)
Bit
0 "Modulation based multislot class" not supported
1 "Modulation based multislot class" supported

High Multislot Capability (2 bit field)
The High Multislot Capability is individually combined with each multislot class field sent by the MS (the possible multislot class fields are: ~~HSCSD multislot class, ECSD multislot class,~~ GPRS multislot class, EGPRS multislot class~~, DTM GPRS multislot class, DTM EGPRS multislot class, extended DTM GPRS multislot class and extended DTM EGPRS multislot class~~) to extend the related multislot class to multislot classes 30 to 45, see 3GPP TS 45.002.

For each multislot class, the following mapping is done:

Bits 2 1	coded multislot class field	actual multislot class
0 0	8	30
0 0	10, 23, 28, 29	39
0 0	11, 20, 25	32
0 0	12, 21, 22, 26, 27	33
0 0	Any other	Multislot Class field value
0 1	8	35
0 1	10, 19, 24	36
0 1	11, 23, 28, 29	45
0 1	12, 21, 22, 26, 27	38
0 1	Any other	Multislot Class field value
1 0	8	40
1 0	10, 19, 24	41
1 0	11, 20, 25	42
1 0	12, 23, 28, 29	44
1 0	Any other	Multislot Class field value
1 1	12, 21, 22, 26, 27	43
1 1	11, 20, 25	37
1 1	10, 19, 24	31
1 1	9, 23, 28, 29	34
1 1	Any other	Multislot Class field value

GERAN Iu Mode Capabilities

This field indicates if the mobile station supports GERAN Iu mode. Furthermore, it indicates the GERAN Iu mode capabilities of the mobile station. The field shall be included if the mobile station supports GERAN Iu mode. If the field is not present, the mobile station does not support GERAN Iu mode.

DTM GPRS High Multi Slot Class (3 bit field)
This field indicates the DTM GPRS multislot capabilities of the MS. It is coded as follows:

Bit 3 2 1	
0 0 0	Unused. If received, the network shall interpret this as '0 0 1'
0 0 1	Multislot class 31 or 36 supported
0 1 0	Multislot class 32 or 37 supported
0 1 1	Multislot class 33 or 38 supported
1 0 0	Multislot class 41 supported
1 0 1	Multislot class 42 supported
1 1 0	Multislot class 43 supported
1 1 1	Multislot class 44 supported

The presence of this field indicates that the MS supports the DTM extension to high multislot classes. When this field is not present, the MS supports the DTM multislot class indicated by the *DTM GPRS Multi Slot Class field*.

The values '0 0 1', '0 1 0' and '0 1 1' shall be interpreted as indicating DTM GPRS multislot class 36, 37 or 38 respectively in case the MS indicates support for one of the GPRS multislot classes 35 to 39; in all other cases those codepoints shall be interpreted as indicating DTM GPRS multislot class 31, 32 or 33 respectively.

This field shall be ignored if the High Multislot Capability field is not present.

DTM EGPRS High Multi Slot Class (3 bit field)
This field indicates the DTM EGPRS multislot capabilities of the MS. This field may be included only if the mobile station supports EGPRS DTM. This field is coded as the DTM GPRS High Multi Slot Class field. When this field is not present, the MS supports the DTM multislot class indicated by the *DTM EGPRS Multi Slot Class field*.

CR-Form-v7.1

CHANGE REQUEST

⌘ **24.008** **CR** **972** ⌘ **rev** **1** ⌘ Current version: **6.8.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Corrections of designations and references of figures and tables
Source:	⌘	Motorola
Work item code:	⌘	TEI6
Date:	⌘	27/04/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

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

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

Reason for change: ⌘ Revision of C1-050516.
Duplicate numbering of figures: figure 10.5.135 is defined in both clause 10.5.2.0 and in clause 10.5.6.2; figure 10.5.134 is defined in both clause 10.5.5.19 and in clause 10.5.6.1.
Text in 10.5.5.19 references the figure 10.5.123 and table 10.5.140 in error.
Four-digit style of numbering figures and tables inconsistent with the remainder of the document, which uses 3 digit style. There is also some editorial inconsistency regarding the capitalization and italicization of the names of the IE throughout section 10.

What has and what has not been fixed:

Rel 5	Rel 6	Fixed in Rel 6
4-digit Figs/Tables	4 digit Figs/Tables	No
-	4 digit Figs/Tables	Yes
Duplicate/wrong reference	Duplicate/wrong reference	Yes
-	Duplicate/wrong reference	Yes

Summary of change: ⌘ Renumber of figures and correct references.

Consequences if not approved: ⌘ Unnecessary difficulties in referencing from within and from outside the document, for complete functionality.

Clauses affected: ⌘ 10.5.1.4, 10.5.5.19, 10.5.5.24, 10.5.5.25, 10.5.6.1, 10.5.6.2, 10.5.6.13, 10.5.6.14, 10.5.6.15, 10.5.6.16, 10.5.7.3

		Y	N			
Other specs affected:	⌘		X	Other core specifications	⌘	
			X	Test specifications		
			X	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/specs/CR.htm. Below is a brief summary:

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

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

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

========== First Modification ==========

10.5.1.4 Mobile Identity

The purpose of the *Mobile Identity* information element is to provide either the international mobile subscriber identity, IMSI, the temporary mobile subscriber identity, TMSI/P-TMSI, the international mobile equipment identity, IMEI, the international mobile equipment identity together with the software version number, IMEISV, or the temporary mobile group identity (TMGI), associated with the optional MBMS Session Identity.

The IMSI shall not exceed 15 digits, the TMSI/P-TMSI is 4 octets long, and the IMEI is composed of 15 digits, the IMEISV is 16 digits (see 3GPP TS 23.003 [10]). The TMGI is at maximum 6 octets long and is defined in subclause 10.5.6.13. The MBMS Session Identity, if included, is 1 octet long (see 3GPP TS 48.018 [86]).

For packet paging the network shall select the mobile identity type with the following priority:

1- P-TMSI: The P-TMSI shall be used if it is available.

2- IMSI: The IMSI shall be used in cases where no P-TMSI is available.

For MBMS (pre-)notification (see 3GPP TS 44.018 [84] and 3GPP TS 44.060 [76]) the network shall select the mobile identity type "TMGI and optional MBMS Session Identity".

NOTE 1: The type of identity "TMGI and optional MBMS Session Identity" is only used by the MBMS (pre-)notification procedure in of A/Gb mode.

For all other transactions except emergency call establishment, emergency call re-establishment, mobile terminated call establishment, the identification procedure, the GMM identification procedure, the GMM authentication and ciphering procedure and the ciphering mode setting procedure, the mobile station and the network shall select the mobile identity type with the following priority:

1- TMSI: The TMSI shall be used if it is available.

2- IMSI: The IMSI shall be used in cases where no TMSI is available.

For mobile terminated call establishment the mobile station shall select the same mobile identity type as received from the network in the PAGING REQUEST message.

For emergency call establishment and re-establishment the mobile station shall select the mobile identity type with the following priority:

1- TMSI: The TMSI shall be used if it is available and if the location update status is UPDATED, and the stored LAI is equal to the one received on the BCCH from the current serving cell.

2- IMSI: The IMSI shall be used in cases where no TMSI is available or TMSI is available but either the update status is different from UPDATED, or the stored LAI is different from the one received on the BCCH from the current serving cell.

3- IMEI: The IMEI shall be used in cases where no SIM/USIM is available or the SIM/USIM is considered as not valid by the mobile station or no IMSI or TMSI is available.

In the identification procedure and in the GMM identification procedure the mobile station shall select the mobile identity type which was requested by the network, if available. If the requested identity is not available, then the mobile station shall indicate the identity type "No Identity".

In the ciphering mode setting procedure and in the GMM authentication and ciphering procedure the mobile shall select the IMEISV.

The *Mobile Identity* information element is coded as shown in figure 10.5.4/3GPP TS 24.008 and table 10.5.4/3GPP TS 24.008.

The *Mobile Identity* is a type 4 information element with a minimum length of 3 octet and 11 octets length maximal. Further restriction on the length may be applied, e.g. number plans.

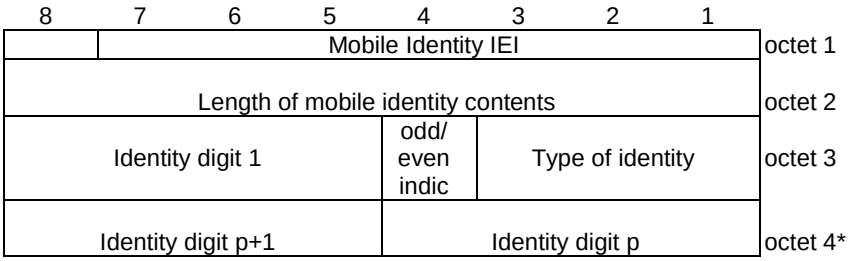

Figure 10.5.4/3GPP TS 24.008 *Mobile Identity* information element

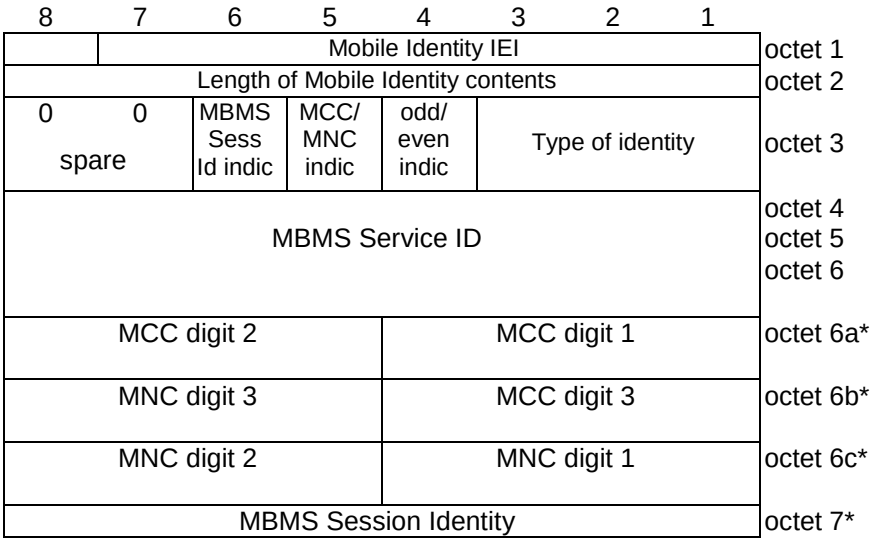

Figure 10.5.4a/3GPP TS 24.008: *Mobile Identity* information element for type of identity "TMGI and optional MBMS Session Identity"

Table 10.5.4/3GPP TS 24.008: *Mobile Identity* information element

Type of identity (octet 3)
Bits

3	**2**	**1**	
0	0	1	IMSI
0	1	0	IMEI
0	1	1	IMEISV
1	0	0	TMSI/P-TMSI
1	0	1	TMGI and optional MBMS Session Identity
0	0	0	No Identity (note 1)

All other values are reserved.

Odd/even indication (octet 3)
Bit

4	
0	even number of identity digits and also when the TMSI/P-TMSI or TMGI and optional MBMS Session Identity is used
1	odd number of identity digits

Identity digits (octet 3 etc)

For the IMSI, IMEI and IMEISV this field is coded using BCD coding. If the number of identity digits is even then bits 5 to 8 of the last octet shall be filled with an end mark coded as "1111".

For Type of identity "No Identity", the Identity digit bits shall be encoded with all 0s and the Length of mobile identity contents parameter shall be set to 1.

If the mobile identity is the TMSI/P-TMSI then bits 5 to 8 of octet 3 are coded as "1111" and bit 8 of octet4 is the most significant bit and bit 1 of the last octet the least significant bit. The coding of the TMSI/P-TMSI is left open for each administration.

For type of identity "TMGI and optional MBMS Session Identity" the coding of octet 3 etc is as follows:

MCC/MNC indication (octet 3)
Bit

5	
0	MCC/MNC is not present
1	MCC/MNC is present

MBMS Session Identity indication (octet 3)
Bit

6	
0	MBMS Session Identity is not present
1	MBMS Session Identity is present

MBMS Service ID (octet 4, 5 and 6)

The contents of the MBMS Service ID field are coded as octets 3 to 5 of the *Temporary Mobile Group Identity* IE. Bit 8 of octet 3 is the most significant bit and bit 1 of octet 5 the least significant bit. The coding of the MBMS Service ID is the responsibility of each administration. Coding using full hexadecimal representation may be used. The MBMS Service ID consists of 3 octets.

MCC, Mobile country code (octet 6a, octet 6b bits 1 to 4)

The MCC field is coded as in ITU-T Rec. E.212, Annex A.

MNC, Mobile network code (octet 6b bits 5 to 8, octet 6c) The coding of this field is the responsibility of each administration but BCD coding shall be used. The MNC shall consist of 2 or 3 digits. If a network operator decides to use only two digits in the MNC, bits 5 to 8 of octet 7 shall be coded as "1111". The contents of the MCC and MNC digits are coded as octets 6 to 8 of the *Temporary Mobile Group Identity* IE in Figure 10.5.~~6.13~~154/3GPP TS 24.008. **MBMS Session Identity** (octet 7) The MBMS Session Identity field is encoded as the value part of the MBMS Session Identity IE as specified in 3GPP TS 48.018 [86].
NOTE 1: This can be used in the case when a fill paging message without any valid identity has to be sent on the paging subchannel and when the requested identity is not available at the mobile station during the identity request procedure.

========== Second Modification ==========

10.5.5.19 A&C reference number

The purpose of the *A&C reference number* information element is to indicate to the network in the AUTHENTICATION AND CIPHERING RESPONSE message which AUTHENTICATION AND CIPHERING REQUEST message the MS is replying to.

The *A&C reference number* is a type 1 information element.

The *A&C reference number* information element is coded as shown in figure 10.5.~~123~~134/3GPP TS 24.008 and table 10.5.~~140~~152/3GPP TS 24.008.

8	7	6	5	4	3	2	1	
A&C reference number IEI				A&C reference number value				octet 1

Figure 10.5.134/3GPP TS 24.008: A&C reference number information element

Table 10.5.152/3GPP TS 24.008: A&C reference number information element

A&C reference number value (octet 1) Unformatted 4 bit field

========== Third Modification ==========

10.5.5.24 Inter RAT information container

The purpose of the *Inter RAT information container* information element is to supply the network with Iu mode related information that needs to be transferred at PS inter-system handover to Iu mode (see 3GPP TS 43.129 [113]).

The *Inter RAT information container* information element is coded as shown in figure 10.5.~~5.24~~150/3GPP TS 24.008.

The *Inter RAT information container* information element is a type 4 information element with a minimum length of 3 octets and a maximum length of 40 octets.

The Inter RAT information container contains:

- predefined configuration status information;

- mobile station security information to be used after handover to Iu mode, which includes the START-PS value that is stored by the MS at handover from Iu mode to A/Gb mode (see 3GPP TS 31.102 [5a]); and/or
- the specific Iu mode radio capabilities of the mobile station, i.e. UE RAC (see 3GPP TS 25.331 [23c]).

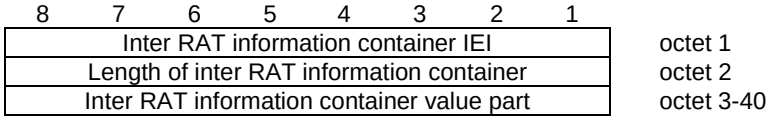

Figure 10.5.~~5.24~~150/3GPP TS 24.008: *Inter RAT information container* information element

The value part of the *Inter RAT information container* information element is the INTER RAT HANDOVER INFO as defined in 3GPP TS 25.331 [23c]. If this field includes padding bits, they are defined in 3GPP TS 25.331 [23c].

10.5.5.25 Requested MS information

The purpose of the *Requested MS information* information element is to indicate whether certain feature-related information is requested from the MS by the network. If this IE is not included then no information is requested.

The *Requested MS information* information element is coded as shown in figure 10.5.5.~~25~~151/3GPP TS 24.008 and table 10.5.~~5.25~~166/3GPP TS 24.008.

The *Requested MS information* is a type 1 information element.

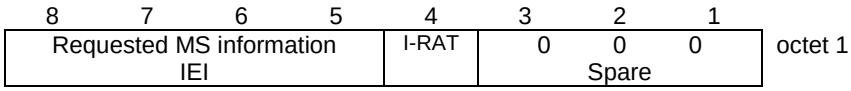

Figure 10.5.~~5.25~~151/3GPP TS 24.008: *Requested MS information* information element

Table 10.5.~~5.25~~166/3GPP TS 24.008: *Requested MS information* information element

Requested MS information value (octet 1, bit 1 to 4)	
I-RAT (1 bit field)	
Bit **4**	
0	Inter RAT information container IE not requested
1	Inter RAT information container IE requested

========== Fourth Modification ==========

10.5.6.1 Access ~~Point~~ point ~~N~~name

The purpose of the ~~*access*~~ *Access point name* information element is to identify the packet data network to which the GPRS user wishes to connect and to notify the access point of the packet data network that wishes to connect to the MS.

The *Access ~~Point~~ point ~~Name~~ name* is a label or a full*y* qualified domain name according to DNS naming conventions (see 3GPP TS 23.003 [10]).

The ~~*access*~~ *Access point name* is a type 4 information element with a minimum length of 3 octets and a maximum length of 102 octets.

The ~~*access*~~ *Access point name* information element is coded as shown in figure 10.5.~~134~~152/3GPP TS 24.008~~ and table 10.5.152/3GPP TS 24.008~~.

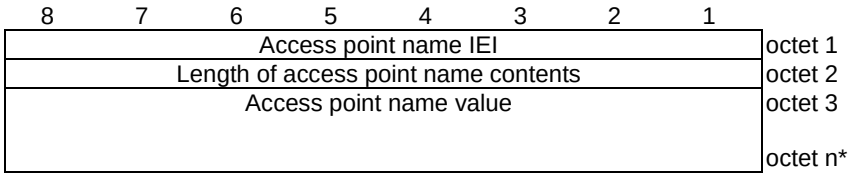

Figure 10.5.~~134~~152/3GPP TS 24.008: *Access point name* information element

The value part is defined in 3GPP TS 23.003 [10].

10.5.6.2 Network service access point identifier

The purpose of the ~~*network*~~ *Network service access point identifier* information element is to identify the service access point that is used for the GPRS data transfer at layer 3.

The ~~*network*~~ *Network service access point identifier* is a type 3 information element with a length of 2 octets.

The value part of a ~~*network*~~ *Network service access point identifier* information element is coded as shown in figure 10.5.~~135~~153/3GPP TS 24.008 and table 10.5.167~~53~~/3GPP TS 24.008.

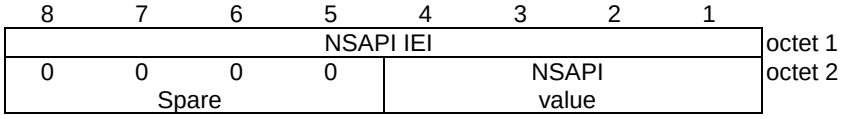

Figure 10.5.~~135~~153/3GPP TS 24.008: *Network service access point identifier* information element

Table 10.5.~~153~~167/3GPP TS 24.008: *Network service access point identifier* information element

NSAPI value (octet 2)

Bits 4	3	2	1	
0	0	0	0	reserved
0	0	0	1	reserved
0	0	1	0	reserved
0	0	1	1	reserved
0	1	0	0	reserved
0	1	0	1	NSAPI 5
0	1	1	0	NSAPI 6
0	1	1	1	NSAPI 7
1	0	0	0	NSAPI 8
1	0	0	1	NSAPI 9
1	0	1	0	NSAPI 10
1	0	1	1	NSAPI 11
1	1	0	0	NSAPI 12
1	1	0	1	NSAPI 13
1	1	1	0	NSAPI 14
1	1	1	1	NSAPI 15

========== Fifth Modification ==========

10.5.6.13 Temporary Mobile Group Identity (TMGI)

The purpose of the *TMGI* element is for group paging in MBMS.

The *TMGI* information element is a type 4 information element with a minimum length of 5 octets and a maximum length of 8 octets. If octet 6 is included, then octets 7 and 8 shall also be included.

The content of the *TMGI* element is shown in Figure 10.5.~~6.13~~154/3GPP TS 24.008 and table 10.5.168/3GPP TS 24.008.

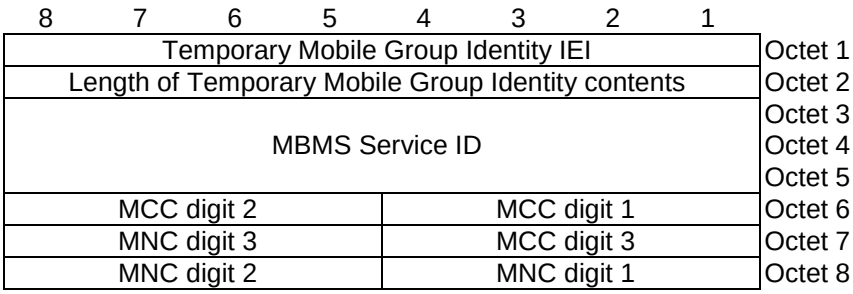

Figure 10.5.~~6.13~~154/3GPP TS 24.008: *TMGI* information element

Table 10.5.~~6.13~~168/3GPP TS 24.008: *TMGI* information element

MBMS Service ID (octet 3, 4 and 5) In the MBMS Service ID field bit 8 of octet 3 is the most significant bit and bit 1 of octet 5 the least significant bit. The coding of the MBMS Service ID is the responsibility of each administration. Coding using full hexadecimal representation may be used. The MBMS Service ID consists of 3 octets. MCC, Mobile country code (octet 6, octet 7 bits 1 to 4) The MCC field is coded as in ITU-T Rec. E.212, Annex A. MNC, Mobile network code (octet 7 bits 5 to 8, octet 8) The coding of this field is the responsibility of each administration but BCD coding shall be used. The MNC shall consist of 2 or 3 digits. If a network operator decides to use only two digits in the MNC, bits 5 to 8 of octet 7 shall be coded as "1111".

10.5.6.14 MBMS bearer capabilities

The purpose of the *MBMS bearer capabilities* information element is to indicate the maximum bit rate for downlink supported by the MS for an MBMS context.

NOTE: The information element indicates the static physical capabilities of the MS, independent of the radio access (UTRAN or GERAN), the radio conditions, or other CS or PS services possibly activated by the MS.

The *MBMS bearer capabilities* is a type 4 information element with a maximum length of 4 octets.

The *MBMS bearer capabilities* information element is coded as shown in figure 10.5.~~6.14~~155/3GPP TS 24.008 and table 10.5.169/3GPP TS 24.008.

8	7	6	5	4	3	2	1	
MBMS bearer capabilities IEI								Octet 1
Length of MBMS bearer capabilities IE								Octet 2
Maximum bit rate for downlink								Octet 3
Maximum bit rate for downlink (extended)								Octet 4

Figure 10.5.~~6.14~~155/3GPP TS 24.008: *MBMS bearer capabilities* information element

Table 10.5.~~6.14~~169/3GPP TR 24.008: *MBMS bearer capabilities* information element

Maximum bit rate for downlink, octet 3 (see 3GPP TS 23.107 [81])

The coding is identical to that of the maximum bit rate for downlink, octet 9, in the *Quality of service* information element (see subclause 10.5.6.5).

If the sending entity wants to indicate a maximum bit rate for downlink higher than 8640 kbps, it shall set octet 3 to ”11111110”, i.e. 8640 kbps, and shall encode the value for the maximum bit rate in octet 4.

Maximum bit rate for downlink (extended), octet 4

The coding is identical to that of the maximum bit rate for downlink (extended), octet 15, in the *Quality of service* information element (see subclause 10.5.6.5).

10.5.6.15 MBMS protocol configuration options

The purpose of the *MBMS protocol configuration options* information element is to:

- transfer protocol options associated with the bearer level of an MBMS context activation, and
- transfer additional MBMS bearer related (protocol) data (e.g. configuration parameters, error codes or messages/events).

The *MBMS protocol configuration options* is a type 4 information element with a minimum length of 3 octets and a maximum length of 253 octets.

The *MBMS protocol configuration options* information element is coded as shown in figure 10.5.~~6.15~~156/3GPP TS 24.008 and table 10.5.~~6.15~~170/3GPP TS 24.008.

8	7	6	5	4	3	2	1	
MBMS protocol configuration options IEI								octet 1
Length of MBMS protocol configuration options contents								octet 2
0	0	0	0	0	0	0	0	octet 3
Spare								

Figure 10.5.~~6.15~~156/3GPP TS 24.008: *MBMS protocol configuration options* information element

Table 10.5.~~6.15~~170/3GPP TR 24.008: *MBMS protocol configuration options* information element

Bits 1 to 8 of octet 3 are spare and shall be coded as "0".

NOTE: The reason for defining the information element is to have a transparent mechanism in the SGSN available from the introduction of MBMS. This will ensure that MS – GGSN communication is possible if new MBMS bearer service related parameters are defined.

10.5.6.16 Enhanced network service access point identifier

The purpose of the ~~*enhanced*~~ *Enhanced network service access point identifier* information element is to identify the service access point that is used at layer 3.

The ~~*enhanced*~~ *Enhanced network service access point identifier* is a type 3 information element with a length of 2 octets.

The value part of an ~~*enhanced*~~ *Enhanced network service access point identifier* information element is coded as shown in figure 10.5.~~6.16~~157/3GPP TS 24.008 and table 10.5.~~6.16~~171/3GPP TS 24.008.

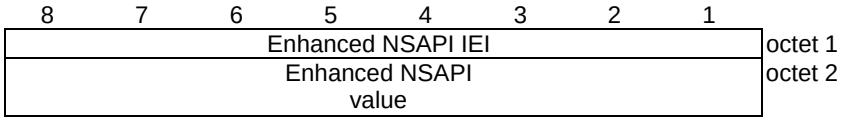

Figure 10.5.~~6.16~~157/3GPP TS 24.008: *Enhanced network service access point identifier* information element

Table 10.5.~~6.16~~171/3GPP TS 24.008: *Enhanced network service access point identifier* information element

Enhanced NSAPI value (octet 2, bits 1 to 7)	
Bits **8 7 6 5 4 3 2 1**	
0 0 0 0 0 0 0 0	Reserved
through	
0 1 1 1 1 1 1 1	Reserved
1 0 0 0 0 0 0 0	NSAPI 128 for Multimedia Broadcast/Multicast Service (MBMS)
through	
1 1 1 1 1 1 1 1	NSAPI 255 for Multimedia Broadcast/Multicast Service (MBMS)

========== Sixth Modification ==========

10.5.7.3 GPRS Timer

The purpose of the *GPRS timer* information element is to specify GPRS specific timer values, e.g. for the READY timer.

The *GPRS timer* is a type 3 information element with 2 octets length.

The *GPRS timer* information element is coded as shown in figure 10.5.146/3GPP TS 24.008 and table 10.5.~~162~~172/3GPP TS 24.008.

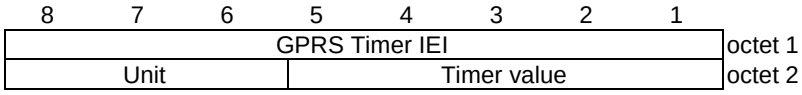

Figure 10.5.146/3GPP TS 24.008: *GPRS Timer* information element

Table 10.5.~~162~~172/3GPP TS 24.008: *GPRS Timer* information element

Timer value (octet 2)

Bits 5 to 1 represent the binary coded timer value.

Bits 6 to 8 defines the timer value unit for the GPRS timer as follows:
Bits
8 7 6
0 0 0 value is incremented in multiples of 2 seconds
0 0 1 value is incremented in multiples of 1 minute
0 1 0 value is incremented in multiples of decihours
1 1 1 value indicates that the timer is deactivated.

Other values shall be interpreted as multiples of 1 minute in this version of the protocol.

3GPP TSG-CT1 Meeting #38
Cancun, Mexico, 25-29 April 2005

Tdoc C1-050747
revised from Tdoc C1-050531

CR-Form-v7.1

CHANGE REQUEST

⌘ **24.008** **CR** **973** ⌘ **rev** **1** ⌘ Current version: **6.8.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Handling of duplicated RAU on the network side
Source:	⌘	NEC
Work item code:	⌘	TEI6
Date:	⌘	15/04/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

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

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

Reason for change:	⌘	Under certain circumstances the network receives duplicated RAU messages for instance following lower layers errors and repetitions, or abnormal RR/RRC connection set-up times or because of RA borderline situations. TS 24.008 specifies the behaviour on the network side on receipt of duplicated (GPRS) ATTACH REQUEST (see TS 24.008 sub-clause 4.7.3.1.6). The behaviour implements a work around procedure that minimises requests from the MS being rejected. It is proposed to extends such procedure to the ROUTING AREA UPDATE REQUEST case. This change is backward compatible and inter-operable with older releases MS implementations.
Summary of change:	⌘	A description on how the network shall handle duplicated ROUTING AREA UPDATE REQUEST messages is added. The change is based on the procedure already present for the (GPRS) ATTACH REQUEST. In addition the (GPRS) ATTACH REQUEST abnormal case description is corrected to reflect the fact that the (GPRS) ATTACH COMPLETE is not systematically sent back to the network.
Consequences if not approved:	⌘	The TS 24.008 does not specify how the network shall behave on receipt of duplicated ROUTING AREA UPDATE REQUEST. In absence of specification, the network may chose to abort and unnecessary reject the whole procedure leading the MS to enter into a recovery state and thus delaying service

availability to the user.

Clauses affected:	⌘	4.7.3.1.6; 4.7.5.1.6			
Other specs affected:	⌘	Y	N		
			X	Other core specifications	⌘
			X	Test specifications	
			X	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/specs/CR.htm. Below is a brief summary:

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

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

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

********** FIRST CHANGE **********

4.7.3.1.6 Abnormal cases on the network side

The following abnormal cases can be identified:

a) Lower layer failure

If a low layer failure occurs before the message ATTACH COMPLETE has been received from the MS and a new P-TMSI (or a new P-TMSI and a new P-TMSI signature) has been assigned, the network shall consider both the old and new P-TMSI each with its corresponding P-TMSI-signature as valid until the old P-TMSI can be considered as invalid by the network (see subclause 4.7.1.5) and shall not resent the message ATTACH ACCEPT. During this period the network may:

- use the identification procedure followed by a P-TMSI reallocation procedure if the old P-TMSI is used by the MS in a subsequent message.

b) Protocol error

If the ATTACH REQUEST message is received with a protocol error, the network shall return an ATTACH REJECT message with one of the following reject causes:

#96: Mandatory information element error;

#99: Information element non-existent or not implemented;

#100: Conditional IE error;

#111: Protocol error, unspecified.

c) T3350 time-out

On the first expiry of the timer, the network shall retransmit the ATTACH ACCEPT message and shall reset and restart timer T3350.

This retransmission is repeated four times, i.e. on the fifth expiry of timer T3350, the GPRS attach procedure shall be aborted. If a new P-TMSI or a new P-TMSI together with a new P-TMSI signature were allocated in the ATTACH ACCEPT message, the network shall consider both the old and new P-TMSI each together with the corresponding P-TMSI signatures as valid until the old P-TMSI can be considered as invalid by the network (see subclause 4.7.1.5). During this period the network acts as specified for case a.

d.1) ATTACH REQUEST received after the ATTACH ACCEPT message has been sent and before the ATTACH COMPLETE message is received

- If one or more of the information elements in the ATTACH REQUEST message differ from the ones received within the previous ATTACH REQUEST message, the previously initiated GPRS attach procedure shall be aborted if the ATTACH COMPLETE message has not been received ~~shall be aborted~~ and the new GPRS attach procedure shall be progressed, or

- If the information elements do not differ~~If no information element differ~~, then the ATTACH ACCEPT message shall be resent and the timer T3350 shall be restarted if an ATTACH COMPLETE message is expected. In that case, the retransmission counter related to T3350 is not incremented.

d.2) More than one ATTACH REQUEST received and no ATTACH ACCEPT or ATTACH REJECT message has been sent

- If one or more of the information elements in the ATTACH REQUEST message differs from the ones received within the previous ATTACH REQUEST message, the previously initiated GPRS attach procedure shall be aborted and the new GPRS attach procedure shall be progressed;

- If the information elements do not differ, then the network shall continue with the previous attach procedure and shall not treat any further this ATTACH REQUEST message.

e) ATTACH REQUEST received in state GMM-REGISTERED

If an ATTACH REQUEST message is received in state GMM-REGISTERED the network may initiate the GMM common procedures; if it turned out that the ATTACH REQUEST message was send by an MS that has already been attached, the GMM context, PDP contexts and MBMS contexts, if any, are deleted and the new ATTACH REQUEST is progressed.

f) ROUTING AREA UPDATE REQUEST message received before ATTACH COMPLETE message.

Timer T3350 shall be stopped. The allocated P-TMSI shall be considered as valid and the routing area updating procedure shall be progressed as described in subclause 4.7.5.

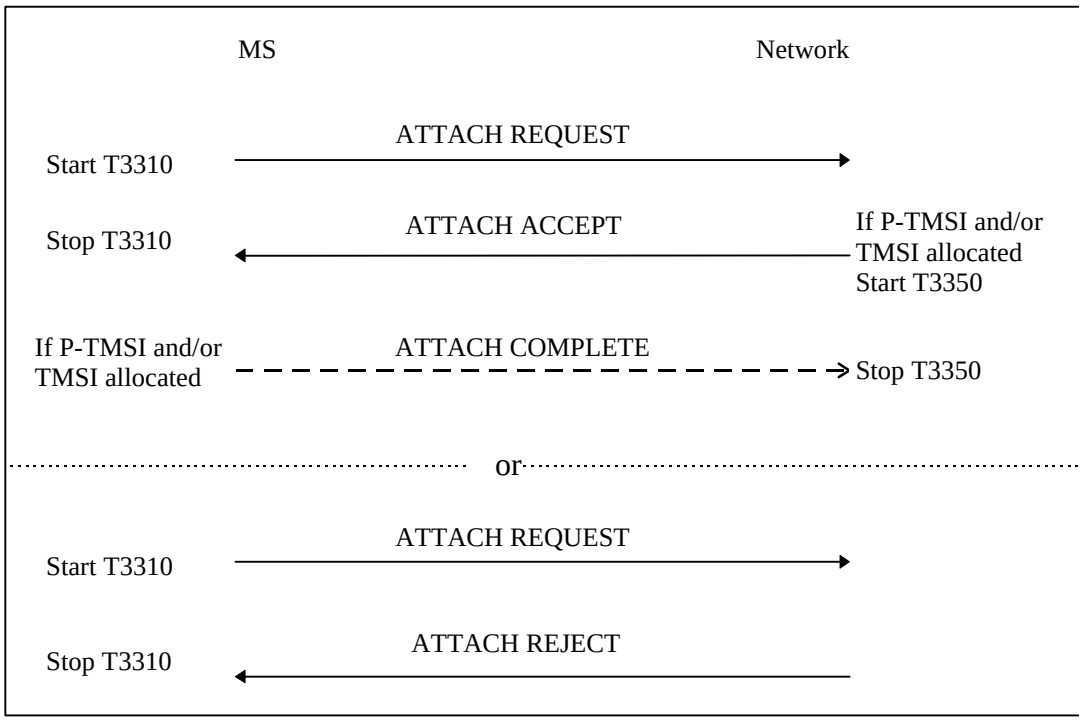

Figure 4.7.3/1 3GPP TS 24.008: GPRS attach procedure and combined GPRS attach procedure

********** NEXT CHANGE **********

4.7.5.1.6 Abnormal cases on the network side

The following abnormal cases can be identified:

a) If a lower layer failure occurs before the message ROUTING AREA UPDATE COMPLETE has been received from the MS and a P-TMSI and/or PTMSI signature has been assigned, the network shall abort the procedure and shall consider both, the old and new P-TMSI and the corresponding P-TMSI signatures as valid until the old P-TMSI can be considered as invalid by the network (see subclause 4.7.1.5). During this period the network may use the identification procedure followed by a P-TMSI reallocation procedure if the old P-TMSI is used by the MS in a subsequent message.

NOTE: Optionally, paging with IMSI may be used if paging with old and new P-TMSI fails. Paging with IMSI causes the MS to re-attach as described in subclause 4.7.9.1.

b) Protocol error

If the ROUTING AREA UPDATE REQUEST message has been received with a protocol error, the network shall return a ROUTING AREA UPDATE REJECT message with one of the following reject causes:

#96: Mandatory information element error;

#99: Information element non-existent or not implemented;

#100: Conditional IE error;

#111: Protocol error, unspecified.

c) T3350 time-out

On the first expiry of the timer, the network shall retransmit the ROUTING AREA UPDATE ACCEPT message and shall reset and restart timer T3350. The retransmission is performed four times, i.e. on the fifth expiry of timer T3350, the routing area updating procedure is aborted. Both, the old and the new P-TMSI and the corresponding P-TMSI signatures shall be considered as valid until the old P-TMSI can be considered as invalid by the network(see subclause 4.7.1.5). During this period the network acts as described for case a above.

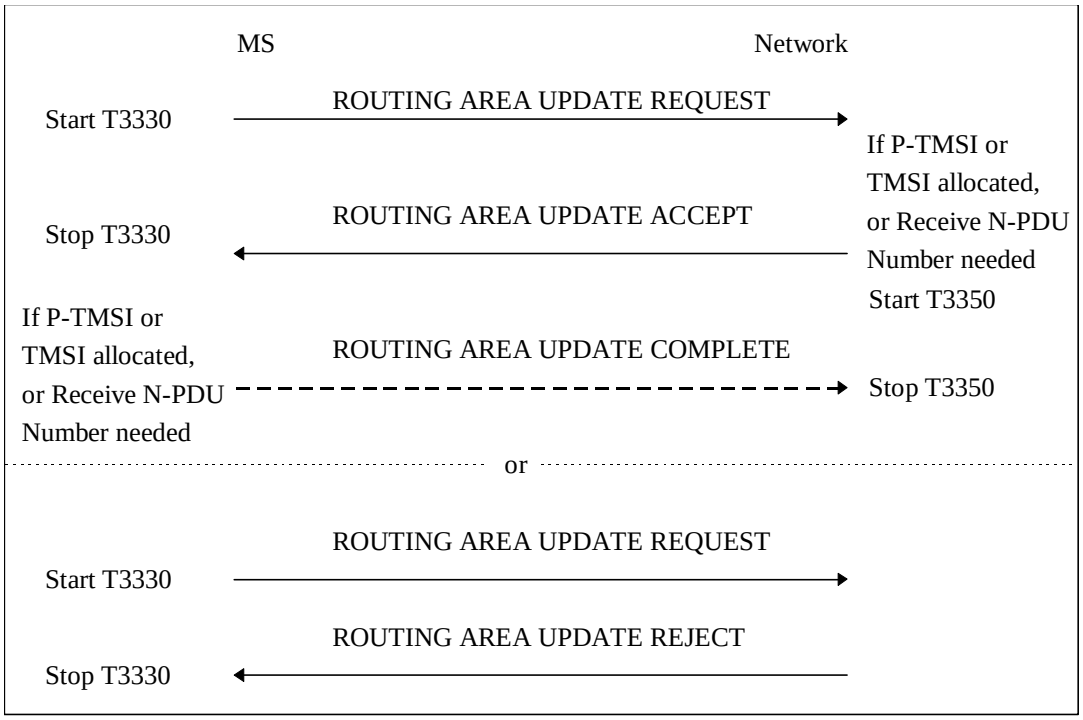

Figure 4.7.5/1 3GPP TS 24.008: Routing and combined routing area updating procedure

d.1) ROUTING AREA UPDATE REQUEST received after the ROUTING AREA UPDATE ACCEPT message has been sent and before the ROUTING AREA UPDATE COMPLETE message is received

- If one or more of the information elements in the ROUTING AREA UPDATE REQUEST message differ from the ones received within the previous ROUTING AREA UPDATE REQUEST message, the previously initiated routing area updating procedure shall be aborted if the ROUTING AREA UPDATE COMPLETE message has not been received and the new routing area updating procedure shall be progressed, or

- If the information elements do not differ, then the ROUTING AREA UPDATE ACCEPT message shall be resent and the timer T3350 shall be restarted if an ROUTING AREA UPDATE COMPLETE message is expected. In that case, the retransmission counter related to T3350 is not incremented.

d.2) More than one ROUTING AREA UPDATE REQUEST received and no ROUTING AREA UPDATE ACCEPT or ROUTING AREA UPDATE REJECT message has been sent

- If one or more of the information elements in the ROUTING AREA UPDATE REQUEST message differs from the ones received within the previous ROUTING AREA UPDATE REQUEST message, the previously initiated routing area updating procedure shall be aborted and the new routing area updating procedure shall be progressed;

- If the information elements do not differ, then the network shall continue with the previous routing area updating procedure and shall not treat any further this ROUTING AREA UPDATE REQUEST message.

********** END OF THE CHANGES *******

3GPP TSG-CT1 Meeting #38
Cancun, Mexico, 25-29 April 2005

Tdoc C1-050748

CR-Form-v7.1

CHANGE REQUEST

⌘ **24.008** **CR** **974** ⌘ **rev** **1** ⌘ Current version: **6.8.0** ⌘

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

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

Title:	⌘	Cell Update triggered by low layers
Source:	⌘	Infineon
Work item code:	⌘	TEI6
Date:	⌘	17/04/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

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

Use one of the following releases:

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

Reason for change:	⌘	In case of certain RLC/MAC procedures it is necessary to perform a Cell Update in order to trigger the resumption of the DL data transfer.
Summary of change:	⌘	It is explicitly stated that a cell update may be triggered by lower layers.
Consequences if not approved:	⌘	Missing MS behavior if a cell update is requested by lower layers.

Clauses affected:	⌘	4.7.2.6

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

Other comments: ⌘

4.7.2 GPRS Mobility management timers and UMTS PS signalling connection control

4.7.2.1 READY timer behaviour

4.7.2.1.1 READY timer behaviour (A/Gb mode only)

The READY timer, T3314 is used in the MS and in the network per each assigned P-TMSI to control the cell updating procedure.

When the READY timer is running or has been deactivated the MS shall perform cell update each time a new cell is selected (see 3GPP TS 43.022 [82]). If a routing area border is crossed, a routing area updating procedure shall be performed instead of a cell update.

When the READY timer has expired the MS shall:

- perform the routing area updating procedure when a routing area border is crossed;
- not perform a cell update when a new cell is selected.

All other GMM procedures are not affected by the READY timer.

The READY timer is started:

- in the MS when the GMM entity receives an indication from lower layers that an LLC frame other than LLC NULL frame has been transmitted on the radio interface; and
- in the network when the GMM entity receives an indication from lower layers that an LLC frame other than LLC NULL frame has been successfully received by the network.

Within GMM signalling procedures the network includes a "force to standby" information element, in order to indicate whether or not the READY timer shall be stopped when returning to the GMM-REGISTERED state. If the "force to standby" information element is received within more than one message during a ongoing GMM specific procedure, the last one received shall apply. If the READY timer is deactivated and the network indicates "force to standby" with the "force to standby" information element, this shall not cause a modification of the READY timer.

The READY timer is not affected by state transitions to and from the GMM-REGISTERED.SUSPENDED sub-state.

The value of the READY timer may be negotiated between the MS and the network using the GPRS attach or GPRS routing area updating procedure.

- If the MS wishes to indicate its preference for a READY timer value it shall include the preferred values into the ATTACH REQUEST and/or ROUTING AREA UPDATE REQUEST messages. The preferred values may be smaller, equal to or greater than the default values or may be equal to the value requesting the READY Timer function to be deactivated.
- Regardless of whether or not a timer value has been received by the network in the ATTACH REQUEST or ROUTING AREA UPDATE REQUEST messages, the network may include a timer value for the READY timer (different or not from the default value) into the ATTACH ACCEPT or ROUTING AREA UPDATE ACCEPT messages, respectively. If the READY Timer value was included, it shall be applied for the GMM context by the network and by the MS.
- When the MS proposes a READY Timer value and the Network does not include any READY Timer Value in its answer, then the value proposed by the MS shall be applied for the GMM context by the Network and by the MS.
- When neither the MS nor the Network proposes a READY Timer value into the ATTACH ACCEPT or ROUTING AREA UPDATE ACCEPT message, then the default value shall be used.

If the negotiated READY timer value indicates that the ready timer function is deactivated, the READY timer shall always run without expiry. If the negotiated READY timer value indicates that the ready timer function is deactivated, and within the same procedure the network indicates "force to standby" with the "force to standby" information

element, the READY timer shall always run without expiry. If the negotiated READY timer value is set to zero, READY timer shall be stopped immediately.

To account for the LLC frame uplink transmission delay, the READY timer value should be slightly shorter in the network than in the MS. This is a network implementation issue.

If a new READY timer value is negotiated, the MS shall upon the reception of the ATTACH ACCEPT or ROUTING AREA UPDATE ACCEPT message perform a initial cell update (either by transmitting a LLC frame or, if required, a ATTACH COMPLETE or ROUTING AREA UPDATE COMPLETE message), in order to apply the new READY timer value immediately. If both the network and the MS supports the Cell Notification, the initial cell update shall use any LLC frame except the LLC NULL frame. If the new READY timer value is set to zero or if the network indicates "force to standby" with the "force to standby" IE, the initial cell update should not be done.

4.7.2.1.2 Handling of READY timer in Iu mode (Iu mode only)

The READY timer is not applicable for Iu mode.

An MS may indicate a READY timer value to the network in the ATTACH REQUEST and the ROUTING AREA UPDATE REQUEST messages.

If a READY timer value is received by an MS capable of both Iu mode and A/Gb mode in the ATTACH ACCEPT or the ROUTING AREA UPDATE ACCEPT messages, then the received value shall be stored by the MS in order to be used at an intersystem change from Iu mode to A/Gb mode.

4.7.2.2 Periodic routing area updating

Periodic routing area updating is used to periodically notify the availability of the MS to the network. The procedure is controlled in the MS by the periodic RA update timer, T3312. The value of timer T3312 is sent by the network to the MS in the messages ATTACH ACCEPT and ROUTING AREA UPDATE ACCEPT. The value of the timer T3312 shall be unique within a RA.

If the T3312 received by the MS contains an indication that the timer is deactivated or the timer value is zero, then the periodic routing area update timer is deactivated and the MS shall not perform periodic routing area updating.

In A/Gb mode, the timer T3312 is reset and started with its initial value, when the READY timer is stopped or expires. The timer T3312 is stopped and shall be set to its initial value for the next start when the READY timer is started. If after a READY timer negotiation the READY timer value is set to zero, timer T3312 is reset and started with its initial value. If the initial READY timer value is zero, the timer T3312 is reset and started with its initial value, when the ROUTING AREA UPDATE REQUEST message is transmitted.

In Iu mode, the timer T3312 is reset and started with its initial value, when the MS goes from PMM-CONNECTED to PMM-IDLE mode. The timer T3312 is stopped when the MS enters PMM-CONNECTED mode.

When timer T3312 expires, the periodic routing area updating procedure shall be started and the timer shall be set to its initial value for the next start.

If the MS is in other state than GMM-REGISTERED.NORMAL-SERVICE when the timer expires the periodic routing area updating procedure is delayed until the MS returns to GMM-REGISTERED.NORMAL-SERVICE.

In A/Gb mode, if the MS in MS operation mode B is in the state GMM-REGISTERED.SUSPENDED when the timer expires the periodic routing area updating procedure is delayed until the state is left.

The network supervises the periodic routing area updating procedure by means of the Mobile Reachable timer. The Mobile Reachable timer shall be longer than the periodic RA update timer. When the Mobile Reachable timer expires, typically the network stops sending paging messages to the mobile and may take other appropriate actions.

In A/Gb mode, the Mobile Reachable timer is reset and started with its initial value, when the READY timer is stopped or expires. The Mobile Reachable timer is stopped and shall be set to its initial value for the next start when the READY timer is started.

In A/Gb mode, if after a READY timer negotiation the READY timer value is set to zero the Mobile Reachable timer is reset and started with its initial value. If the initial READY timer value is zero, the Mobile Reachable is reset and started with its initial value, when the ROUTING AREA UPDATE REQUEST message is received.

In Iu mode, the Mobile Reachable timer is reset and started with its initial value, when the MS goes from PMM-CONNECTED to PMM-IDLE mode. The Mobile Reachable timer is stopped when the MS enters PMM-CONNECTED mode.

If the MS is both IMSI attached for GPRS and non-GPRS services, and if the MS lost coverage of the registered PLMN and timer T3312 expires, then:

a) if the MS returns to coverage in a cell that supports GPRS and that indicates that the network is in network operation mode I, then the MS shall either perform the combined routing area update procedure indicating "combined RA/LA updating with IMSI attach"; or

b) if the MS returns to coverage in a cell in the same RA that supports GPRS and that indicates that the network is in network operation mode II or III, then the MS shall perform the periodic routing area updating procedure indicating "Periodic updating"; or

c) if the MS was both IMSI attached for GPRS and non-GPRS services in network operation mode I and the MS returns to coverage in a cell in the same LA that does not support GPRS, then the MS shall perform the periodic location updating procedure. In addition, the MS shall perform a combined routing area update procedure indicating "combined RA/LA updating with IMSI attach" when the MS enters a cell that supports GPRS and that indicates that the network is in network operation mode I; or

d) if the MS returns to coverage in a new RA the description given in subclause 4.7.5 applies.

If the MS is both IMSI attached for GPRS and non-GPRS services in a network that operates in network operation mode I, and if the MS has camped on a cell that does not support GPRS, and timer T3312 expires, then the MS shall start an MM location updating procedure. In addition, the MS shall perform a combined routing area update procedure indicating "combined RA/LA updating with IMSI attach" when the MS enters a cell that supports GPRS and indicates that the network is in operation mode I.

If timer T3312 expires during an ongoing CS connection, then a MS operating in MS operation mode B shall treat the expiry of T3312 when the MM state MM-IDLE is entered, analogous to the descriptions for the cases when the timer expires out of coverage or in a cell that does not support GPRS.

In A/Gb mode, timer T3312 shall not be stopped when a GPRS MS enters state GMM-REGISTERED.SUSPENDED.

4.7.2.3 PMM-IDLE mode and PMM-CONNECTED mode (Iu mode only)

An MS shall enter PMM-CONNECTED mode when a PS signalling connection for packet switched domain is established between the MS and the network. The MS shall not perform periodic routing area update in PMM-CONNECTED mode.

An MS shall enter PMM-IDLE mode when the PS signalling connection for packet switched domain between the MS and the network has been released. The MS shall perform periodic routing area update in PMM-IDLE mode.

4.7.2.4 Handling of *Force to standby* in Iu mode (Iu mode only)

Force to standby is not applicable for Iu mode.

The network shall always indicate *Force to standby not indicated* in the *Force to standby* information element.

The *Force to standby* information element shall be ignored by the MS.

4.7.2.5 RA Update procedure for Signalling Connection Re-establishment (Iu mode only)

When the MS receives an indication from the lower layers that the RRC connection has been released with cause "Directed signalling connection re-establishment", see 3GPP TS 25.331 [23c] and 3GPP TS 44.118 [111], then the MS shall enter PMM-IDLE mode and initiate immediately a normal routing area update procedure (the use of normal or combined procedure depends on the network operation mode in the current serving cell) regardless whether the routing area has been changed since the last update or not. This routing area update procedure shall also be performed or continued if the MS has performed an inter-system change towards GSM, irrespective whether the READY timer is running or the MS is in PMM-IDLE or PMM-CONNECTED mode.

4.7.2.6 Cell Update triggered by low layers

A Cell Update may be requested by the low layers, see 3GPP TS 44.060. In this case the Cell Update shall be performed even if the READY timer is not running. If both the network and the MS support the Cell Notification, then the MS shall use the LLC NULL frame to perform the Cell Update.

3GPP TSG-CT1 Meeting #38
Cancun, Mexico, 25-29 April 2005

Tdoc C1-050751
Revision of C1-050593

CR-Form-v7.1

CHANGE REQUEST

⌘ **24.008** **CR** **984** ⌘ **rev** **1** ⌘ Current version: **6.8.0** ⌘

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

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

Title:	⌘	Mobile identity IE length when 'No identity'
Source:	⌘	Ericsson
Work item code:	⌘	TEI6
Date:	⌘	15/04/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

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

Use one of the following releases:

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

Reason for change:	⌘	The CR 971 (NP-040203) introduced the possibility for the mobile station to answer with Mobile identity IE indicating Identity type 'No identity' when the network request by the IDENTITY REQUEST an identity that the mobile station does not have available. This new possibility was introduced for both the identification and the GMM identification procedure. The Mobile identity IE to be included in the IDENTITY RESPONSE message has a diferent minimum length according to whether the identification or the GMM identification procedure is performed (See 9.2.11 and 9.4.13). However, the sub-clause 10.5.1.4 Mobile identity specifies that if 'No identity' is used the length shall be set to 1. This is only true in case of use of the identification procedure.
Summary of change:	⌘	The sub-clause 10.5.1.4 Mobile Identity is clarified to fulfill the case when the GMM identification is used.
Consequences if not approved:	⌘	The MS would continue not being able to send the Identity type 'No identity' to the network in case of GMM identification procedure as the length of the Mobile identity IE will not be compliant with the IDENTITY RESPONSE message definition. This results in undesirable effects; the octet boundaries of the Mobile identity IE will not be respected leading to an imperative part error, so the GMM identfication procedure fails always.

Clauses affected:	⌘	10.5.1.4

[Y] [N]

Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	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/specs/CR.htm. Below is a brief summary:

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

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

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

1st Change

10.5.1.4 Mobile Identity

The purpose of the *Mobile Identity* information element is to provide either the international mobile subscriber identity, IMSI, the temporary mobile subscriber identity, TMSI/P-TMSI, the international mobile equipment identity, IMEI, the international mobile equipment identity together with the software version number, IMEISV, or the temporary mobile group identity (TMGI), associated with the optional MBMS Session Identity.

The IMSI shall not exceed 15 digits, the TMSI/P-TMSI is 4 octets long, and the IMEI is composed of 15 digits, the IMEISV is 16 digits (see 3GPP TS 23.003 [10]). The TMGI is at maximum 6 octets long and is defined in subclause 10.5.6.13. The MBMS Session Identity, if included, is 1 octet long (see 3GPP TS 48.018 [86]).

For packet paging the network shall select the mobile identity type with the following priority:

1- P-TMSI: The P-TMSI shall be used if it is available.

2- IMSI: The IMSI shall be used in cases where no P-TMSI is available.

For MBMS (pre-)notification (see 3GPP TS 44.018 [84] and 3GPP TS 44.060 [76]) the network shall select the mobile identity type "TMGI and optional MBMS Session Identity".

NOTE 1: The type of identity "TMGI and optional MBMS Session Identity" is only used by the MBMS (pre-)notification procedure in of A/Gb mode.

For all other transactions except emergency call establishment, emergency call re-establishment, mobile terminated call establishment, the identification procedure, the GMM identification procedure, the GMM authentication and ciphering procedure and the ciphering mode setting procedure, the mobile station and the network shall select the mobile identity type with the following priority:

1- TMSI: The TMSI shall be used if it is available.

2- IMSI: The IMSI shall be used in cases where no TMSI is available.

For mobile terminated call establishment the mobile station shall select the same mobile identity type as received from the network in the PAGING REQUEST message.

For emergency call establishment and re-establishment the mobile station shall select the mobile identity type with the following priority:

1- TMSI: The TMSI shall be used if it is available and if the location update status is UPDATED, and the stored LAI is equal to the one received on the BCCH from the current serving cell.

2- IMSI: The IMSI shall be used in cases where no TMSI is available or TMSI is available but either the update status is different from UPDATED, or the stored LAI is different from the one received on the BCCH from the current serving cell.

3- IMEI: The IMEI shall be used in cases where no SIM/USIM is available or the SIM/USIM is considered as not valid by the mobile station or no IMSI or TMSI is available.

In the identification procedure and in the GMM identification procedure the mobile station shall select the mobile identity type which was requested by the network, if available. If the requested identity is not available, then the mobile station shall indicate the identity type "No Identity".

In the ciphering mode setting procedure and in the GMM authentication and ciphering procedure the mobile shall select the IMEISV.

The *Mobile Identity* information element is coded as shown in figure 10.5.4/3GPP TS 24.008 and table 10.5.4/3GPP TS 24.008.

The *Mobile Identity* is a type 4 information element with a minimum length of 3 octet and 11 octets length maximal. Further restriction on the length may be applied, e.g. number plans.

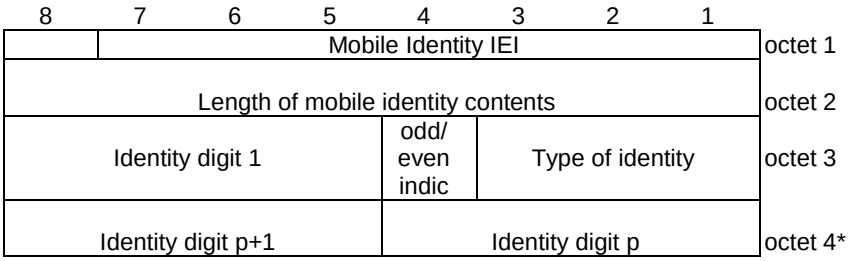

Figure 10.5.4/3GPP TS 24.008 *Mobile Identity* information element

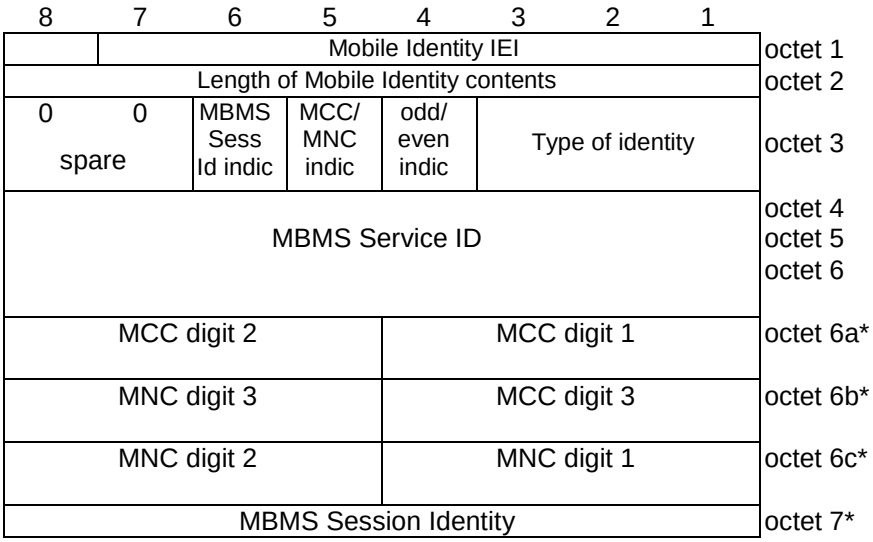

Figure 10.5.4a/3GPP TS 24.008: *Mobile Identity* information element for type of identity "TMGI and optional MBMS Session Identity"

Table 10.5.4/3GPP TS 24.008: *Mobile Identity* information element

Type of identity (octet 3)
Bits

3	**2**	**1**	
0	0	1	IMSI
0	1	0	IMEI
0	1	1	IMEISV
1	0	0	TMSI/P-TMSI
1	0	1	TMGI and optional MBMS Session Identity
0	0	0	No Identity (note 1)

All other values are reserved.

Odd/even indication (octet 3)
Bit

4	
0	even number of identity digits and also when the TMSI/P-TMSI or TMGI and optional MBMS Session Identity is used
1	odd number of identity digits

Identity digits (octet 3 etc)

For the IMSI, IMEI and IMEISV this field is coded using BCD coding. If the number of identity digits is even then bits 5 to 8 of the last octet shall be filled with an end mark coded as "1111".

For Type of identity "No Identity", the Identity digit bits shall be encoded with all 0s and the Length of mobile identity contents parameter shall be set to one of the following values:
- "1" if the identification procedure is used (see subclause 9.2.11);
- "3" if the GMM identification procedure is used (see subclause 9.4.13).

If the mobile identity is the TMSI/P-TMSI then bits 5 to 8 of octet 3 are coded as "1111" and bit 8 of octet4 is the most significant bit and bit 1 of the last octet the least significant bit. The coding of the TMSI/P-TMSI is left open for each administration.

For type of identity "TMGI and optional MBMS Session Identity" the coding of octet 3 etc is as follows:

MCC/MNC indication (octet 3)
Bit

5	
0	MCC/MNC is not present
1	MCC/MNC is present

MBMS Session Identity indication (octet 3)
Bit

6	
0	MBMS Session Identity is not present
1	MBMS Session Identity is present

MBMS Service ID (octet 4, 5 and 6)

The contents of the MBMS Service ID field are coded as octets 3 to 5 of the *Temporary Mobile Group Identity* IE. Bit 8 of octet 3 is the most significant bit and bit 1 of octet 5 the least significant bit. The coding of the MBMS Service ID is the responsibility of each administration. Coding using full hexadecimal representation may be used. The MBMS Service ID consists of 3 octets.

MCC, Mobile country code (octet 6a, octet 6b bits 1 to 4)

The MCC field is coded as in ITU-T Rec. E.212, Annex A.

MNC, Mobile network code (octet 6b bits 5 to 8, octet 6c)

The coding of this field is the responsibility of each administration but BCD coding shall be used. The MNC shall consist of 2 or 3 digits. If a network operator decides to use only two digits in the MNC, bits 5 to 8 of octet 7 shall be coded as "1111".

The contents of the MCC and MNC digits are coded as octets 6 to 8 of the *Temporary Mobile Group Identity* IE in Figure 10.5.6.13/3GPP TS 24.008.

MBMS Session Identity (octet 7)

The MBMS Session Identity field is encoded as the value part of the MBMS Session Identity IE as specified in 3GPP TS 48.018 [86].

NOTE 1: This can be used in the case when a fill paging message without any valid identity has to be sent on the paging subchannel and when the requested identity is not available at the mobile station during the identity request procedure.

3GPP TSG-CT1 Meeting #38
Cancun, Mexico, 25-29 April 2005

Tdoc C1-050779

CR-Form-v7.1

CHANGE REQUEST

⌘ **24.008** **CR** **978** ⌘ **rev** **2** ⌘ Current version: **6.8.0** ⌘

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

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

Title:	⌘	Clarification on locking shift procedure
Source:	⌘	NTT DoCoMo, Ericsson
Work item code:	⌘	TEI6
Date:	⌘	18/04/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

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

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

Reason for change:	⌘	In the last CN1#37 meeting, a discussion was held on how to handle 'comprehension required' IEs when locking shift or non-locking shift procedure is applied. It was found that some legacy mobiles apply the rules defined in codeset 0 to handle IEs encoded as comprehension required, while others apply the rules defined within the shifted codesets. Although it was agreed in the meeting that there should only be one standard mobile behavior, a solution that would not affect the legacy mobile station implementation was preferred. Completely banning the use of IEIs of format "0000…." would solve the problem regardless of which codeset rules the mobile applies. However, it was found that there is at least one case where an IEI encoded as comprehension required is used while the mobile applies the rules defined within the shifted codeset. Consequently, mandating to disallow the use of IEIs of format "0000…." would cause major problems for such legacy mobiles. It is therefore proposed to allow the mobiles to behave according to the rules defined within the shifted codeset, but at the same time, recommend not using IEIs of format "0000…."
Summary of change:	⌘	In subclause 10.5.4.1, a normative text is added to indicate that the mobile station and network shall not apply the "comprehension required" scheme to IEs belonging to codesets other than 0. Additionally, a Note is added to state certain cases where a call is released when IEIs of format "0000…. " are used for codesets other than 0.
Consequences if not approved:	⌘	This addition is seen as an essential correction, as this may lead to different interpretation on the handling of IEs encoded as comprehension required, and in the worst case, may lead to failure of connection.

Clauses affected:	⌘	10.5.4.1			
Other specs affected:	⌘	**Y**	**N**	Other core specifications	⌘
			X	Test specifications	
			X	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/specs/CR.htm. Below is a brief summary:

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

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

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

10.5.4 Call control information elements

10.5.4.1 Extensions of codesets

There is a certain number of possible information element identifier values using the formatting rules described in subclause 10.5: 128 from the type 3 & 4 information element format and at least 8 from the type 1 & 2 information element format.

One value in the type 1 format is specified for shift operations described below. One other value in both the type 3 & 4 and type 1 format is reserved. This leaves 133 information element identifier values available for assignment.

It is possible to expand this structure to eight codesets of 133 information element identifier values each. One common value in the type 1 format is employed in each codeset to facilitate shifting from one codeset to another. The contents of this shift information element identifies the codeset to be used for the next information element or elements. The codeset in use at any given time is referred to as the "active codeset". By convention, codeset 0 is the initially active codeset.

Two codeset shifting procedures are supported: locking shift and non-locking shift.

Codeset 5 is reserved for information elements reserved for national use.

Codeset 6 is reserved for information elements specific to the local network (either public or private).

Codeset 7 is reserved for user-specific information elements.

The coding rules specified in subclause 10.5 shall apply for information elements belonging to any active codeset.

The mobile station and the network shall not apply the "comprehension required" scheme (see 3GPP TS 24.007 [20]) to information elements belonging to codesets different from codeset 0.

IEIs with bits 5, 6, 7 and 8 all set to zero should not be allocated for new optional information elements in codesets different from codeset 0, because there are legacy mobile stations that apply the "comprehension required" scheme also to these information elements, e.g. if such a mobile station receives a SETUP message containing an unknown information element from codeset 5 with an IEI with bits 5, 6, 7 and 8 all set to zero, then the mobile station will release the call.

Transitions from one active codeset to another (i.e. by means of the locking shift procedure) may only be made to a codeset with a higher numerical value than the codeset being left.

An information element belonging to codeset 5, 6 or 7 may appear together with information elements belonging to codeset 0, by using the non-locking shift procedure (see subclause 10.5.4.3).

A user or network equipment shall have the capability to recognize a shift information element and to determine the length of the following information element, although the equipment need not be able to interpret and act on the content of the information element. This enables the equipment to determine the start of the subsequent information element.

10.5.4.2 Locking shift procedure

The locking shift procedure employs an information element to indicate the new active codeset. The specified codeset remains active until another locking shift information element is encountered which specifies the use of another codeset. For example, codeset 0 is active at the start of message content analysis. If a locking shift to codeset 5 is encountered, the next information elements will be interpreted according to the information element identifiers assigned in codeset 5, until another shift information element is encountered. This procedure is used only to shift to a higher order codeset than the one being left.

The locking shift is valid only within that message which contains the locking shift information element. At the start of every message content analysis, the active codeset is codeset 0.

The locking shift information element uses the type 1 information element format and coding shown in figure 10.5.85/3GPP TS 24.008 and table 10.5.98/3GPP TS 24.008.

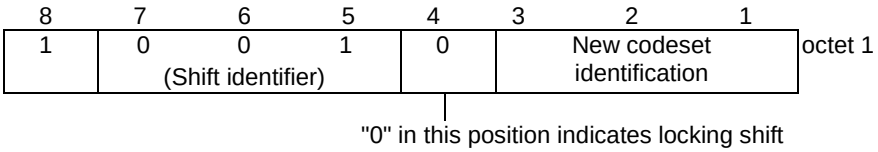

Figure 10.5.85/3GPP TS 24.008 Locking shift element

Table 10.5.98/3GPP TS 24.008: Locking shift element

Codeset identification (octet 1):				
Bits				
3	**2**	**1**		
0	0	0	not applicable	
0	0	1	}	
to			} reserved	
1	0	0	}	
1	0	1	codeset 5:	information elements for national use
1	1	0	codeset 6:	information elements specific to the local network (either public or private)
1	1	1	codeset 7:	user-specific information elements

10.5.4.3 Non-locking shift procedure

The non-locking shift procedure provides a temporary shift to the specified lower or higher codeset. The non-locking shift procedure uses a type 1 information element to indicate the codeset to be used to interpret the next information element. After the interpretation of the next information element, the active codeset is again used for interpreting any following information elements. For example, codeset 0 is active at the beginning of message content analysis. If a non-locking shift to codeset 6 is encountered, only the next information element is interpreted according to the information element identifiers assigned in codeset 6. After this information element is interpreted, codeset 0 will again be used to interpret the following information elements. A non-locking shift information element indicating the current codeset shall not be regarded as an error.

A locking shift information element shall not follow directly a non-locking shift information element. If this combination is received, it shall be interpreted as though a locking shift information element had been received.

The non-locking shift information element uses the type 1 information format and coding shown in figure 10.5.86/3GPP TS 24.008 and table 10.5.99/3GPP TS 24.008.

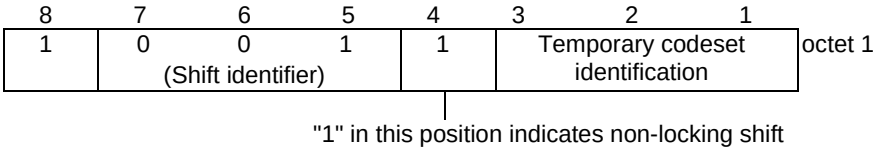

Figure 10.5.86/3GPP TS 24.008 Non-locking shift element

Table 10.5.99/3GPP TS 24.008: Non-locking shift element

Codeset identification (octet 1):				
Bits				
3	**2**	**1**		
0	0	0	codeset 0 (initially active):	
			3GPP TS 24.008 information elements	
0	0	1	}	
to			} reserved	
1	0	0	}	
1	0	1	codeset 5:	information elements for national use
1	1	0	codeset 6:	information elements specific to the local network (either public or private)
1	1	1	codeset 7:	user-specific information elements

3GPP TSG-CT1 Meeting #38
Cancun, Mexico, 25-29 April 2005

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Revision of C1-050781

CR-Form-v7.1

CHANGE REQUEST

⌘ **24.008** **CR** **916** ⌘ **rev** **4** ⌘ Current version: **6.8.0** ⌘

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

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

Title:	⌘	Attach type and Update type IEs
Source:	⌘	Ericsson
Work item code:	⌘	TEI6
Date:	⌘	28/04/2005
Category:	⌘	**F**
Release:	⌘	Rel-6

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

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

Reason for change: ⌘ The MS at receipt of some cause values, e.g. #13, or #15, it has to change the Update status to ROAMING NOT ALLOWED and at the network, the Gs association goes to the state Gs-NULL as indicated in the TS 29.018, which specifies the Gs interface layer 3. Afterwards, the MS shall perform PLMN selection or cell selection, respectively. The successful completion of any of these procedures should make the Gs association move to GS- ASSOCIATED. However, the sub-clause 4.7.5.2.1 'Combined routing area updating procedure initiation' mandates the MS to send **only** the "Combined RA/LA updating" value for the Update Type IE when a combined RA/LA procedure is initiated. This is not correct taking into account 3GPP specifications.

TS 29.018 indicates that the SGSN, at receipt of location update for non-GPRS services (i.e.combined routing area updating or combined attach), sends the VLR the BSSAP+-LOCATION-UPADTE-REQUEST message and this message includes the type of location update performed by the MS. If the MS has peformed combined attach or combined RA/LA with IMSI attach, the SGSN indicates in the BSSAP+ message 'IMSI attach', otherwise 'Normal location update'. Following the state machines and the text specified by TS 29.018 is clear that the Update type "Combined RA/LA updating while IMSI attached" and "Combined RA/LA updating" leads to the Gs association being Gs-ASSOCIATED if the corresponding procedure is successful. The same is applicable to the Attach type values "Combined GPRS/IMSI attach" and "GPRS attach while IMSI attached" used for the combined attach procedure.

Additionally, the sub-clause 4.7.3.2 'Combined GPRS attach procedure for

GPRS and non-GPRS services' is as strict as for the Combined RAU procedure initiation.

It is important to point out that the sub-clause 4.7.3.2 mandates the MS to send the "Combined GPRS attach" value in the ATTACH REQUEST message, when this is not a possible value for the Type of attach parameter as specified in the sub-clause 10.5.5.2, quoting:

> Type of attach (octet 1, bit 1 to 3)
> Bits
> **3 2 1**
> 0 0 1 GPRS attach
> 0 1 0 GPRS attach while IMSI attached
> 0 1 1 **Combined GPRS/IMSI attach**
>
> All other values are interpreted as *GPRS attach in* this version of the protocol.
>
> Follow-on request (octet 1, bit 4)
> Bits
> **4**
> 0 No follow-on request pending
> 1 Follow-on request pending
> Follow-on request pending is applicable only in UMTS.

Finally, it is need to bear in mind that even though the value "GPRS attach while IMSI attached" is a valid value for the Type of attach, it is nothing stated, in the whole TS 24.008, when "GPRS attach while IMSI attached" should be used by the MS. However, CN1 informs by the LS in N1-010718 that "the attach type "GPRS attach while IMSI attached" is not clearly specified, but the use of it is optional in NMO I".

Summary of change:	⌘	Correction of the value of the Attach type in the sub-clause 4.7.3.2. The MS is only allowed to send "Combined GPRS/IMSI attached" from Rel-6. For the combined routing area updating procedure is indicated that the MS can also send "Combined RA/LA while IMSI attached" in some cases.
Consequences if not approved:	⌘	Misalignment among 3GPP specifications remains. Furthermore, the Attach type value specified in the sub-clause 4.7.3.2 does not exist as a possible value for the Type of attach parameter as specified in the sub-clause 10.5.5.2 'Attach type'.

Clauses affected:	⌘	4.7.3.2, 4.7.5.2.1, 4.7.5.2.4, 10.5.5.2

Other specs affected: ⌘	Y	N		⌘
		X	Other core specifications	
		X	Test specifications	
		X	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/specs/CR.htm. Below is a brief summary:

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

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

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

1st Change

4.7.3.2 Combined GPRS attach procedure for GPRS and non-GPRS services

The combined GPRS attach procedure is a GMM procedure used by a GPRS MS operating in MS operation modes A or B for IMSI attach for GPRS and non-GPRS services if the network operates in network operation mode I.

If a GPRS MS operating in MS operation modes A or B is already attached for non-GPRS services by use of the MM specific IMSI attach procedure, but additionally wishes to perform an IMSI attach for GPRS services, the combined GPRS attach procedure shall also be used.

The attach type information element shall indicate "combined GPRS/IMSI attach". In this case, the messages ATTACH ACCEPT, ATTACH COMPLETE, and ATTACH REJECT used by the combined GPRS attach procedure carry information for both the GPRS and the non-GPRS services.

Next Change

4.7.5.2.1 Combined routing area updating procedure initiation

The combined routing area updating procedure is initiated only by a GPRS MS operating in MS operation modes A or B, if the MS is in state GMM-REGISTERED and MM-IDLE, and if the network operates in network operation mode I:

- when a GPRS MS that is IMSI attached for GPRS and non-GPRS services detects a change of the routing area in state GMM-REGISTERED and MM-IDLE;
- when a GPRS MS that is IMSI attached for GPRS services wants to perform an IMSI attach for non-GPRS services;
- after termination of a non-GPRS service via non-GPRS channels to update the association if the MS has changed the RA during that non-GPRS service transaction;
- after termination of non-GPRS service via non-GPRS channels to update the association if GPRS services were suspended during the non-GPRS service but no resume is received. See 3GPP TS 23.060 subclause 16.2.1;
    - after a CM SERVICE REJECT message with cause value #4 is received by the mobile station (see subclause 4.5.1.1); in this case the update type IE shall be set to "Combined RA/LA updating with IMSI attach";
    - when a GPRS MS needs to update the network with the new MS Radio Access Capability IE;
    - when a GPRS MS needs to update the network with a new DRX parameter IE; or
    - in UMTS, to re-synchronize the PMM mode of MS and network after RRC connection release with cause "Directed signalling connection re-establishment", see subclause 4.7.2.5.

In GSM, the routing and location area identification are broadcast on the broadcast channel(s). A combined routing area updating procedure shall abort any ongoing GMM procedure. Aborted GMM procedures shall be repeated after the combined routing area updating procedure has been successfully performed. The ROUTING AREA UPDATE REQUEST message shall always be the first message sent from the MS in the new routing area after routing area change.

In UMTS, the routing and location area identification are broadcast on the broadcast channel(s) or sent to the MS via the PS signaling connection. A combined routing area updating procedure shall abort any ongoing GMM procedure. Aborted GMM procedures may be repeated after the combined routing area updating procedure has been successfully performed. The ROUTING AREA UPDATE REQUEST message shall always be the first GMM message sent from the MS in the new routing area after routing area change.

To initiate a combined routing area updating procedure the MS sends the message ROUTING AREA UPDATE REQUEST to the network, starts timer T3330 and changes to state GMM-ROUTING-UPDATING-INITIATED and MM LOCATION UPDATING PENDING. The value of the ~~u~~Update type IE in the message shall indicate "combined RA/LA updating" unless explicitly specified otherwise. If for the last attempt to update the registration of the location

area a MM specific procedure was performed, the value of the ~~u~~Update type IE in the ROUTING AREA UPDATE REQUEST message shall indicate "combined RA/LA updating with IMSI attach". Furthermore the MS shall include the TMSI status IE if no valid TMSI is available.

A GPRS MS in MS operation modes A or B that is in an ongoing circuit-switched transaction, shall initiate the combined routing area updating procedure after the circuit-switched transaction has been released, if the MS has changed the RA during the circuit-switched transaction and if the network operates in network operation mode I.

A GPRS MS in MS operation mode A shall initiate the combined routing area updating procedure with IMSI attach after the circuit-switched transaction has been released if a GPRS attach was performed during the circuit-switched transaction and provided that the network operates in network operation mode I.

A GPRS MS in MS operation mode A shall perform the normal routing area update procedure during an ongoing circuit-switched transaction.

In UMTS, if the MS wishes to prolong the established PS signalling connection after the normal routing area updating procedure (for example, the MS has any CM application request pending), it may set a follow-on request pending indicator on (see subclause 4.7.13).

In UMTS, when a ROUTING AREA UPDATE REQUEST is received by the SGSN over a new PS signalling connection while there is an ongoing PS signalling connection (network is already in mode PMM-CONNECTED) for this UE, the network shall progress the routing area update procedure as normal and release the previous PS signalling connection when the routing area update procedure has been accepted by the network.

NOTE: The re-establishment of the radio bearers of active PDP contexts is done as described in subclause "Service Request procedure".

Next Change

4.7.5.2.4 Combined routing area updating not accepted by the network

If the combined routing area updating cannot be accepted, the network sends a ROUTING AREA UPDATE REJECT message to the MS. An MS that receives a ROUTING AREA UPDATE REJECT message stops timer T3330, enters state MM IDLE, and for all causes except #12, #14 and #15 deletes the list of "equivalent PLMNs".

The MS shall then take different actions depending on the received reject cause:

3 (Illegal MS);

6 (Illegal ME), or

8 (GPRS services and non GPRS services not allowed);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED and the update status to U3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and enter the state GMM-DEREGISTERED. Furthermore, it shall delete any P-TMSI, P-TMSI signature, TMSI, RAI, LAI, ciphering key sequence number and GPRS ciphering key sequence number and shall consider the SIM/USIM as invalid for GPRS and non GPRS services until switching off or the SIM/USIM is removed.

7 (GPRS services not allowed);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The SIM/USIM shall be considered as invalid for GPRS services until switching off or the SIM/USIM is removed. The new state is GMM-DEREGISTERED. If in the MS the timer T3212 is not already running, the timer shall be set to its initial value and restarted.

A GPRS MS operating in MS operation mode A or B in network operation mode I, is still IMSI attached for CS services in the network. and shall then proceed with the appropriate MM specific procedure according to the MM service state.

9 (MS identity cannot be derived by the network);

The MS shall set the GPRS update status to GU2 NOT UPDATED (and shall store it according to subclause 4.1.3.2), enter the state GMM-DEREGISTERED, and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. Subsequently, the MS may automatically initiate the GPRS attach procedure.

A GPRS MS operating in MS operation mode A or B in network operation mode I, is still IMSI attached for CS services in the network.

10 (Implicitly detached);

A GPRS MS operating in MS operation mode A or B in network operation mode I, is IMSI detached for both GPRS and CS services in the network.

The MS shall change to state GMM-DEREGISTERED.NORMAL-SERVICE. The MS shall then perform a new attach procedure. The MS should also activate PDP context(s) to replace any previously active PDP context(s). The MS should also perform the procedures needed in order to activate any previously active multicast service(s).

NOTE: In some cases, user interaction may be required and then the MS cannot activate the PDP/MBMS context(s) automatically.

11 (PLMN not allowed);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED and the update status to U3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and enter the state GMM-DEREGISTERED. Furthermore, it shall delete any P-TMSI, P-TMSI signature, TMSI, RAI, LAI, ciphering key sequence number GPRS ciphering key sequence number, and reset the location update attempt counter.

The MS shall store the PLMN identity in the "forbidden PLMN list".

The MS shall then perform a PLMN selection according to 3GPP TS 23.122 [14].

12 (Location area not allowed);

The MS shall delete any RAI, P-TMSI, P-TMSI signature and GPRS ciphering key sequence number, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2), shall reset the routing area updating attempt counter and shall change to state GMM-DEREGISTERED.LIMITED-SERVICE.

The MS shall in addition set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ciphering key sequence number and shall reset the location update attempt counter. The new MM state is MM IDLE.

The mobile station shall store the LAI in the list of "forbidden location areas for regional provision of service".

The MS shall perform a cell selection according to 3GPP TS 43.022 [82] and 3GPP TS 25.304.

13 (Roaming not allowed in this location area);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2), shall reset the routing area updating attempt counter and shall change to state GMM-REGISTERED.LIMITED-SERVICE.

The MS shall in addition set the update status to U3 ROAMING NOT ALLOWED and shall reset the location update attempt counter. The new MM state is MM IDLE.

The MS shall store the LAI in the list of "forbidden location areas for roaming".

The MS shall perform a PLMN selection according to 3GPP TS 23.122 [14].

The MS shall indicate the Update type IE "combined RA/LA updating with IMSI attach" when performing the routing area updating procedure following the PLMN selection.

14 (GPRS services not allowed in this PLMN);

The MS shall delete any RAI, P-TMSI, P-TMSI signature, and GPRS ciphering key sequence number stored, shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to subclause 4.1.3.2) and shall change to state GMM-DEREGISTERED. If in the MS the timer T3212 is not already running, the timer shall be set to its initial value and restarted.

The MS shall store the PLMN identity in the "forbidden PLMNs for GPRS service" list.

A GPRS MS operating in MS operation mode A or B in network operation mode I, is still IMSI attached for CS services in the network and shall then proceed with the appropriate MM specific procedure according to the MM service state.

As an implementation option, a GPRS MS operating in operation mode A or B may perform a PLMN selection according to 3GPP TS 23.122 [14].

The MS shall not perform the optional PLMN selection in the case where the PLMN providing this reject cause is:

- On the "User Controlled PLMN Selector with Access Technology " or,
- On the "Operator Controlled PLMN Selector with Access Technology " list or,
- A PLMN identified as equivalent to any PLMN, with the same MCC, contained in the lists above.

15 (No Suitable Cells In Location Area);

The MS shall set the GPRS update status to GU3 ROAMING NOT ALLOWED (and shall store it according to clause 4.1.3.2), shall reset the routing area updating attempt counter and shall change to state GMM-REGISTERED.LIMITED-SERVICE.

The MS shall in addition set the update status to U3 ROAMING NOT ALLOWED and shall reset the location update attempt counter. The new MM state is MM IDLE.

The MS shall store the LAI in the list of "forbidden location areas for roaming".

The MS shall search for a suitable cell in another location area in the same PLMN according to 3GPP TS 43.022 [82] and 3GPP TS 25.304.

The MS shall indicate the Update type IE "combined RA/LA updating with IMSI attach" when performing the routing area updating procedure.

Other values are considered as abnormal cases. The specification of the MS behaviour in those cases is described in subclause 4.7.5.2.5.

Next Change

10.5.5.2 Attach type

The purpose of the *attach type* information element is to indicate the type of the requested attach, i.e. whether the MS wants to perform a GPRS or combined GPRS attach.

The *attach type* is a type 1 information element.

The *attach type* information element is coded as shown in figure 10.5.117b/3GPP TS 24.008 and table 10.5.135b/3GPP TS 24.008.

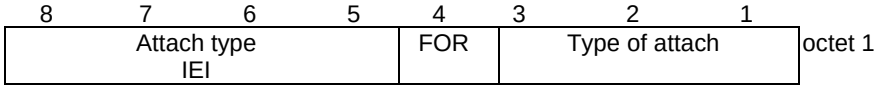

Figure 10.5.117b/3GPP TS 24.008: *Attach type* information element

Table 10.5.135b/3GPP TS 24.008: *Attach type* information element

Type of attach (octet 1, bit 1 to 3)
Bits

3	**2**	**1**	
0	0	1	GPRS attach
0	1	0	~~GPRS attach while IMSI attached~~Not used. This value was allocated in earlier versions of the protocol (Note 1)
0	1	1	Combined GPRS/IMSI attach

All other values are interpreted as *GPRS attach* in this version of the protocol.

Follow-on request (octet 1, bit 4)
Bits

4	
0	No follow-on request pending
1	Follow-on request pending

Follow-on request pending is applicable only in Iu mode.

NOTE 1: The code point “010” if received by the network, it shall be interpreted as "Combined GPRS/IMSI attach".