3GPP TSG_CN **Tdoc NP-000258**
Plenary Meeting #8, Dusseldorf, Germany
21st – 23rd June 2000.

Source:	**TSG_N WG "1"**
Title:	**All Lses from TSGN1 since TSGN#7**
Agenda item:	**5.1.1**
Document for:	**Information**

Introduction:

This document contains **"16"** Laison statements**,** that have been agreed by **TSG_N WG "1",** and are forwarded to the related groups.

TSGN1 number	Title	Related spec	Related documents	Se
N1-000639	Proposed response to LS to N1 on including the SAI into the Gs-i/f BSSAP+-LOCATION-UPDATE-REQUEST message as requested in N1-000543	29.018	LS out (R3, CC:S2)	To:R3, Cc:S2
N1-000701	LS on clarifications to DRX parameter for GMM		LS out + N1-000755	To RAN2 and RAN
N1-000703	Response to LS (R2-000945), LS TSG S1 (00) 103 on UE/MS idle mode operation and LS TSG S1 (00) 368 on PLMN selection		LS out + N1-000796	To: R2,S1, Cc: SM
N1-000710	Response to LS on usage of terms GSM, UMTS and GERAN		LS out	To: SA1, SA2, SM
N1-000712	Terminal capability negotiation including codecs (reply)		LS out	To: T2 MMS adho
N1-000713	Response to LS TSGS1#8(00)245 on the introduction of a user controlled switch of the priority of the user and operator preferred PLMN list		LS out	To:S1, cc: T2, T3,
N1-000715	Response to LS on hexadecimal IMEI format		LS out + N1-000779	To: SA WG3 SA W WG4, RAN WG2, Association, Cc: S
N1-000751	Liaison statement on Global solution of "Cause of no CLI"		LS out + N1-000750	To SA1, CN4, sen to N4
N1-000758	LS on Removal of Service Accept		LS out + N1-000646	To:SA2
N1-000787	Codec Lists from Ue for different Access technologies	24.008/ OoBTC	LSout	To: SA4
N1-000793	Change of the GMM Ready Timer behaviour	23.060/ GPRS	CR147r3	To S2 (related to N
N1-000795	LS on Transport of Codec Information during the Codec Negotiation between MS and MSC		LS out	To: R2, R3
N1-000797	LS on UE triggered authentication and key agreement during connections		LS out	To: SA3, Cc:R2, T Note: SA3 to be se reflector.

N1-000804	Reply to LS on Correction for mobile stations staying in GMM		LS out + N1-000763, N1-000791, N1-000792, N1-000793	To: SMG2
N1-000805	Liaison Statement on the introduction of 3G MS capabilities in MS classmark 3		LS out + N1-000697	To: SMG2, SMG2
N1-000806	Reply to LS on "GPRS ciphering "		LS out + N1-000722, N1-000798	To:S3, CN, Cc:SM

Title:　　Response to LS to N1 on including the SAI into the Gs-i/f BSSAP+-LOCATION-UPDATE-REQUEST message as requested in N1-000543

Source:　　N1

TO:　　R3

Cc:　　S2

WI:

Contact Person:
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Date:　　　　22/05/2000

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N1 thank R3 for the LS (N1-000595(R3-001217)).

As already stated in last paragraph of your LS, N1 believe that the reason for introduction of SAI is using not in the location management but in the applications like that CAMEL. In detail, the new cell global identity IE in the BSSAP+-LOCATION-UPDATE-REQUEST message is for the location management in UMTS as GSM and the new service area identification IE is for the other applications in UMTS (This relationship between IEs corresponds to the one between LAI IE and the SAI IE in the RANAP Initial UE message.) The requirement was also mentioned in the LS from S2 (N1-000023, R3-000055, S2-99F29).

Therefore N1 would like to inform R3 that N1-000543 is still valid as it is.

N1-000595.doc　N1-000023(S2-9 29).doc

3GPP TSG-CN-WG1, Meeting #12
22-26 May, 2000
Oahu/Hawaii, USA

Tdoc N1-000701

Title: **LS on clarifications to DRX parameter for GMM**

Source: **TSG-CN WG1**

TO: **TSG-RAN WG2 and TSG-RAN WG3**

Cc:

WI: **GSM/UMTS interworking**

Contact Person:
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Date: **23.05.2000**

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TSG-CN WG1 is gratefull for Liaison Statements from TSG-RAN WG2 (R2-000910)(N1-000587) and TSG-RAN WG3 (TSGR3#12(00)1110)(N1-000594) on support of idle-mode DRX control, and their review of the CR (Tdoc N1-000551) now included in 24.008 v3.3.1 for the support of configurable DRX cycle length for each MS.

In the CN1#12 meeting the attached CR (Tdoc N1-000755) was agreed in order to clarify issues 1,2 and 3 below, commented by R2. CN1 believes this completes the issues raised.

Below issue 3 and 4 follows additional CN1 responses:

1. TSG-RAN WG2 thinks it should be clarified that for the values e.g. the meaning of 0010 should not be coefficient number 2, it is the actual value of the coefficient that equals 2.

2. TSG-RAN WG2 also thinks the value 0000 should have the meaning that it is not specified in GMM/not signaled by GMM. This is because it is specified in the RRC protocol and is therefore not unspecified in any case. A proposed name could be "CN DRX control not applicable".

3. TSG-RAN WG2 would like TSG-CN WG1 to clarify what is meant with "UMTS RAN" that was included in the agreed CR. TSG-RAN WG2 have the assumption that this does not include GERAN.

CN1: Since GERAN is a R00 WI, it is not included. UMTS RAN was intended to be Iu for the PS domain, and is changed to 'In UMTS' according to current used terminology. However the terminology is now under discussion and any change will then automatically also cover this case.

4. TSG-RAN WG2 would also like get clarification if this idle mode DRX control only applies to GMM and not to MM.

CN1: The idle mode DRX control applies only to GMM, and is specified in chapters accordingly.

3GPP TSG CN WG1
Oahu, Hawaii, USA. 22 - 26 May 2000

N1-000703

Source:	**TSG-CN WG1**
To:	**TSG-RAN WG2, TSG-SA WG1**
Cc:	**SMG2**
Title:	**Response to LS (R2-000945), LS TSG S1 (00) 103 on UE/MS idle mode operation and LS TSG S1 (00) 368 on PLMN selection**

Contact: Olivier Irac, Ericsson
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N1 thanks R2 and S1 for their LS on UE/MS idle mode operation and PLMN selection.

N1 would like to highlight that the current N1 proposal (CR003 on TS23.122) is consistent with the requirements in 22.011 (from S1) and in line with the workshop conclusions in June 99.

Access technologies are associated on the SIM card with the HPLMN, the user preferred PLMNs and the operator preferred PLMNs and can be used to influence and speed up the selection.

Provision for multiple HPLMN codes has been made in the coding format used for the HPLMN with access technology field in the SIM card. However this won't be supported in R99 due to the multiple impacts this has, not only on PLMN selection, but also on cell reselection and handovers. For R99, it is assumed that the HPLMN Selector with Access Technology data field should contain only one PLMN code identical to the HPLMN code included in the IMSI.

The MS also stores on the SIM card the RPLMN last used access technology to be able to speed up the search for RPLMN at power on.

At power on, the search for the RPLMN will start with the RPLMN last used access technology stored on the SIM card. If the MS cannot find the RPLMN using the last used access technology then the MS will extend the scan for RPLMN to all its supported access technologies.

In a similar way, the search for the HPLMN will start with the access technology(ies) present in the HPLMN Selector with Access Technology field on the SIM in priority order. If the HPLMN isn't found by scanning this access technology(ies), then the MS will extend the scan for HPLMN to all its supported access technologies.

The search for the user preferred and operator preferred PLMNs list will be restricted to the access technology(ies) associated with each PLMN in the list. If a PLMN on the selector list is not found on the indicated access technology(ies) then the search will continue from the next entry on the selector list and not by extending the search of the same PLMN on other possibly supported access technologies.

For the search of any PLMN in random order and any PLMN in descending order of the signal quality the MS has to search for all supported access technologies.

N1 hopes that this explains it understands the requirements on the PLMN Selection procedure.

N1 would also like to stress that N1 needs to consider requirements from EDGE COMPACT in the PLMN selection procedures, in addition to the GSM/UMTS scenarios, although this is not so relevant to R2. To have a single procedure which can be applied to both is much simpler for MS implementations.

Title:	**Response to LS on usage of terms GSM, UMTS and GERAN**
Source:	**TSG-CN WG1**
To:	**TSG SA WG1, TSG SA WG2, SMG2**
Cc:	**TSG-RAN WG3**
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CN WG1 thanks SA WG1 for the liaison stament S1 (00) 320 (N1-000601) on the usage of terms GSM, UMTS and GERAN. CN WG1 shares the concern of SA WG1 on some of the terminology CN WG1 has been using in R99 specifications under its control.

During the meeting and in an email discussion before the meeting terms 2G mode of operation and 3G mode of operation were suggested as this would be reflected in the A- or Iu-interface. But N1 needs tangible criteria for the mobile station CN protocols to decide whether a certain IE shall be encoded in a message. As EDGE is considered a 3G technology and as it is not always possible for the mobile station to know about the interface beyond the serving radio network the modes of operation are not acceptable from the N1 viewpoint.

The terms GSM and UMTS N1 has been using have not been very orthodox, but in the absence of better definitions they have served the purpose in labeling the applicability of each section of common CN specification based on the radio access technology. The terms are defined in 24.008 as follows:

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

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

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

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

So when defining new terminology to replace these, the serving radio access network aspect needs to be considered, otherwise the editorial change of terminology becomes an essential change of the protocol functionality. As an outcome of the discussion N1 ended up proposing the following terminology:

In GSM,…   -> In GERAN,…
In UMTS,…   -> In UTRAN,…
(GSM only)   -> (GERAN only)
(UMTS only)   -> (UTRAN only)

If GERAN is not acceptable R99 term then N1 would like to know what would be the name of GSM radio network for R99 and onwards?

In order to avoid waste of time CN WG1 intends to correct the terminology throughout the specifications under its control as soon as these or any other feasible terms can be confirmed by the other groups.

Title:	**Terminal capability negotiation including codecs (reply)**

Source:	**TSG-CN WG1**

TO:	**TSG-T WG2 MMS adhoc**
Cc:	**SA2, SA4**

Contact Person:		**Edgar Lycksell**
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	Tel:	**+46 653 50 002**

Date:	**23 May 2000**

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TSG-CN WG1 thanks TSG-T WG2 MMS adhoc for the LS contained in TDoc N1-000613 (T2M000047) and is happy to provide the following answers to the questions raised:

1. *Is there an existing scheme to support reporting/ negotiation of terminal capabilities?*

   In the current (R99) protocol for the circuit switched (CS) domain, bearer capabilities (BC) can be negotiated during call setup (SETUP and CALL PROCEEDING/ CALL CONFIRMED messages). For details, see TS 24.008 (latest version is currently 3.3.1).

   CS multimedia is supported by H.324. This set of protocols includes an inband mechanism for negotiation. However, this may not be sufficient and work is ongoing to define additional mechanisms.

   For R00, call control for packet switched (PS) multimedia will be based on SIP. This protocol includes mechanisms for end-to-end capability negotiations. Work for R00 is ongoing.

2. *Is there some signalling that includes what codecs that are supported in the terminal? In that case, where is this signalling and the content of the messages specified?*

   In the current signalling, a list of speech codecs can be included in the BC information element, see question 1 above. For details, see TS 24.008.

   Also the SIP protocol includes such possibilities on an end-to-end basis.

3. *What kind of information is included in the UMTS terminal classmarks?*

   The MS Classmark, the MS Network Capability, the Call Control Capability and the MS Radio Access Capability information elements contain basic information on the access capabilities of the MS/UE, radio capabilities as well as basic service capabilities. Details can be found in TS 24.008.

4. *When are the UMTS terminal classmarks sent and to what entity in the network?*

   The information elements mentioned under 3 above (MS Classmark etc.) are normally sent during a registration procedure (LOCATION UPDATE, ATTACH REQUEST, etc) or at an early stage of a call control or session management procedure (SETUP, CALL CONFIRMED, etc). Core Network (CN) and service related capability information is handled by CN nodes (MSC and SGSN) while radio access capability information is handled by radio access nodes (BSC and RNC). Details can be found in TS 24.008.

Source: **TSG-CN WG1**

To: **S1**

Cc: **T2, T3, SMG9**

Title: **Response to LS TSGS1#8(00)245 on the introduction of a user controlled switch of the priority of the user and operator preferred PLMN list**

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TSG-CN WG1 thanks TSG-S1 for their LS (TSGS1#8(00)245) on the introduction of a user controlled switch of the priority of the user and operator preferred PLMN list. N1 takes note of this new requirement, which has an impact on the N1 TS23.122 specification.

N1 has some comments and questions for clarification below:

- the S1 CR on 22.011 only applies to the automatic network selection mode. Is it the intention that the switch doesn't apply to manual network selection mode (to sort the list displayed to the user)?

- PLMN selection is already a complicated procedure and adding this switch makes the procedure even more complex and confusing for the user. The prioritization of the operator list can already be achieved today by emptying the user list.

Title: **Response to LS on hexadecimal IMEI format**

Source: **TSG-CN WG1**

To: **SA WG3 SA WG5, SA WG1, CN WG4, RAN WG2, RAN WG3, GSM Association**

Cc: **SA WG2**

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CN WG1 thanks SA WG1 for the liaison stament S1(00)370 / N1-000625 on the hexadecimal IMEI format.

CN WG1 was able to agree the attached CR in tdoc N1-000779 after the receiving LS S3-000352 / N1-000776 from SA WG3.

CHANGE REQUEST

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

24.008	CR	**211r1**	Current Version:	3.3.1

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

For submission to:	TSGN#8	for approval	X	strategic		*(for SMG*
list expected approval meeting # here ↑		for information		non-strategic		*use only)*

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

Proposed change affects:
(at least one should be marked with an X)

(U)SIM ☐   ME **X**   UTRAN / Radio ☐   Core Network **X**

Source:	Motorola, Ericsson		**Date:**	May 25, 2000

Subject:	Addition of PFC Feature and Extended GEA in MS Network Capability IE

Work item:	QoS & GSM/UMTS Interoperability

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

				Release:	
F	Correction	**X**		Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	**X**
				Release 00	

Reason for change:

1) Stage 3 work has been completed in SMG2 WPA for BSS Involvement in QoS. In order for the MS to receive an SGSN-assigned PFI in the Activate PDP Context Accept message, the MS shall set a "PFC feature" indicator in the MS Network Capabilities IE in the GMM Attach Request. For this reason, the CR proposes the *addition of a PFC Feature indicator in the Network Capabilities IE.*

In addition, the CR proposes to *add support for more GPRS Encryption Algorithms.* This is in line with SA3/SMG10 that suggest the MS Network Capability IE to be extended by a another octet and the additional bits to be used to indicate the capability to support GEA/2, …, GEA/7 (see Tdoc N1-000690). Note that the GEA II ciphering algorithm has already been approved by SMG to be mandatory in R'99 starting after 31st of December 2002.

The proposed additions would increase the total length of the Network Capabilities IE from 3 to 4 octets.

2) During inter-SGSN RAU's the MS Network Capability IE is transferred to another SGSN in the MM Context IE of the SGSN Context Response message (see 3G TS 29.060). Given the different lengths of the MS Network Capability IE expected by 2G- and 3G-SGSN's this may result to incompatibility problems. Consider for instance the case where an MS is attached to a 3G-SGSN and then roams into an area controlled by a 2G-SGSN. The 2G-SGSN will receive the MS Network Capability IE from the 3G-SGSN and it *may* discard the octets after the 3rd since it cannot process them. If afterwards the MS roams again into an area controlled by a 3G-SGSN, the latter will receive the MS Network Capability IE from the 2G-SGSN but with some octets missing. Hence the new features supported by the missing octets will not be visible to the new 3G-SGSN. This can be characterized as a GSM/UMTS Interoperability problem. It must be noted that this problem may be encountered in the future for other IE's as well.

To resolve this problem the CR proposes to include the MS Network Capability IE in the RAU message.

Clauses affected: 9.4.1, 9.4.14, 10.5.5.3, 10.5.5.12

Other specs affected:

Other 3G core specifications	**X**	→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments: Note that a PFC_FEATURE_MODE indicator (see GSM 04.60 section 12.24 "GPRS Cell Options") is specified in the system information to indicate to R99 MSs that the PFC feature is supported by the network and therefore the R99 MS may initiate PFC procedures in the uplink direction by including a PFI in TBF establishment procedures.

help.doc

<---------- double-click here for help and instructions on how to create a CR.

9.4 GPRS Mobility Management Messages

9.4.1 Attach request

This message is sent by the MS to the network in order to perform a GPRS or combined GPRS attach. See table 9.4.1/TS 24.008.

Message type: ATTACH REQUEST

Significance: dual

Direction: MS to network

Table 9.4.1/TS 24.008: ATTACH REQUEST message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip indicator	Skip indicator 10.3.1	M	V	½
	Attach request message identity	Message type 10.4	M	V	1
	MS network capability	MS network capability 10.5.5.12	M	LV	~~2~~3-9
	Attach type	Attach type 10.5.5.2	M	V	½
	GPRS ciphering key sequence number	Ciphering key sequence number 10.5.1.2	M	V	½
	DRX parameter	DRX parameter 10.5.5.6	M	V	2
	P-TMSI or IMSI	Mobile identity 10.5.1.4	M	LV	6 - 9
	Old routing area identification	Routing area identification 10.5.5.15	M	V	6
	MS Radio Access capability	MS Radio Access capability 10.5.5.12a	M	LV	6 - 52
19	Old P-TMSI signature	P-TMSI signature 10.5.5.8	O	TV	4
17	Requested READY timer value	GPRS Timer 10.5.7.3	O	TV	2
9-	TMSI status	TMSI status 10.5.5.4	O	TV	1

9.4.1.1 Old P-TMSI signature

This IE is included if a valid P-TMSI and P-TMSI signature are stored in the MS.

9.4.1.2 Requested READY timer value

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

9.4.1.3 TMSI status

This IE shall be included if the MS performs a combined GPRS attach and no valid TMSI is available.

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

9.4.14   Routing area update request

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

Message type: ROUTING AREA UPDATE REQUEST

Significance: dual

Direction: MS to network

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

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

9.4.14.1   Old P-TMSI signature

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

9.4.14.2   Requested READY timer value

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

9.4.14.3   DRX parameter

This IE may be included if the MS wants to indicate new DRX parameters.

9.4.14.4   TMSI status

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

9.4.14.5   P-TMSI (UMTS only)

This IE shall be included by the MS.

<u>9.4.14.x   MS network capability</u>

<u>This IE shall be included by the MS to indicate it's capabilities to the network.</u>

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

10.5.5.3   Ciphering algorithm

The purpose of the *ciphering algorithm* information element is to specify which ciphering algorithm shall be used.

The *ciphering algorithm* is a type 1 information element.

The *ciphering algorithm* information element is coded as shown in figure 10.5.119/TS 24.008 and table 10.5.136/TS 24.008.
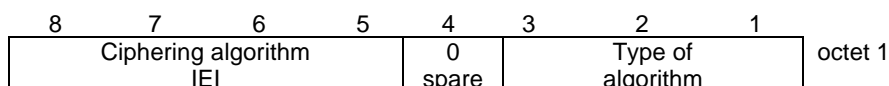
8	7	6	5	4	3	2	1	
Ciphering algorithm IEI				0 spare	Type of algorithm			octet 1

Figure 10.5.119/TS 24.008: *Ciphering algorithm* **information element**

Table 10.5.136/TS 24.008: *Ciphering algorithm* **information element**

Type of ciphering algorithm   (octet 1)
Bits
3 2 1
0 0 0   ciphering not used
0 0 1   GPRS Encryption Algorithm GEA/1
<u>0 1 0   GPRS Encryption Algorithm GEA/2</u>
<u>0 1 1   GPRS Encryption Algorithm GEA/3</u>
<u>1 0 0   GPRS Encryption Algorithm GEA/4</u>
<u>1 0 1   GPRS Encryption Algorithm GEA/5</u>
<u>1 1 0   GPRS Encryption Algorithm GEA/6</u>
<u>1 1 1   GPRS Encryption Algorithm GEA/7</u>
~~All other values are interpreted *reserved* by this version of the protocol.~~

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

10.5.5.12   MS network capability

The purpose of the *MS network capability* information element is to provide the network with information concerning aspects of the mobile station related to GPRS. The contents might affect the manner in which the network handles the operation of the mobile station. The *MS network capability* 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 network capability* is a type 4 information element with a maximum of ~~3~~ <u>10</u> octets length.

The value part of a *MS network capability* information element is coded as shown in figure 10.5.128/TS 24.008 and table 10.5.145/TS 24.008.
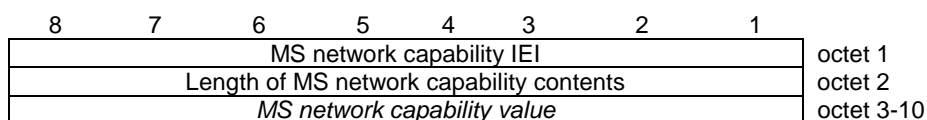
8	7	6	5	4	3	2	1	
MS network capability IEI								octet 1
Length of MS network capability contents								octet 2
MS network capability value								octet 3<u>-10</u>

Figure 10.5.128/TS 24.008 MS network capability information element

Table 10.5.145/TS 24.008 *MS network capability* information element

<MS network capability value part> ::=

<**GEA1 bits**>
<**SM capabilities via dedicated channels**: bit>
<**SM capabilities via GPRS channels**: bit>
　　<**UCS2 support**: bit>
<**SS Screening Indicator**: bit string(2)>
<SoLSA Capability : bit>
<Revision level indicator: bit>
<PFC feature mode: bit>
<Extended GEA bits>
<Spare bits>;

<**GEA1 bits**> ::= < **GEA/1** :bit>;

<Extended GEA bits> ::= <GEA/2:bit><GEA/3:bit>< GEA/4:bit >< GEA/5:bit >< GEA/6:bit ><GEA/7:bit>;

<**Spare bits**> ::= null | {<spare bit> < **Spare bits** >};

SS Screening Indicator
　　0 0　　defined in TS 24.080

　　0 1　　defined in TS 24.080
　　1 0　　defined in TS 24.080
　　1 1　　defined in TS 24.080

SM capabilities via dedicated channels
　　0　　Mobile station does not support mobile terminated point to point SMS via
　　　　dedicated signalling channels
　　1　　Mobile station supports mobile terminated point to point SMS via dedicated
　　　　signalling channels

SM capabilities via GPRS channels
　　0　　Mobile station does not support mobile terminated point to point SMS via
　　　　GPRS packet data channels
　　1　　Mobile station supports mobile terminated point to point SMS via GPRS
　　　　packet data channels

UCS2 support
This information field indicates the likely treatment by the mobile station of UCS2 encoded character strings.
　　0　　the ME has a preference for the default alphabet (defined in GSM 03.38)
　　　　over UCS2.
　　1　　the ME has no preference between the use of the default alphabet and the
　　　　use of UCS2.

GPRS Encryption Algorithm GEA/1
0　　encryption algorithm **GEA/1**not available
1　　encryption algorithm **GEA/1** available

SoLSA Capability
　　0　　The ME does not support SoLSA.
　　1　　The ME supports SoLSA.
Revision level indicator
　　0　　used by a mobile station supporting earlier versions of the protocol
　　1　　used by a mobile station supporting this version of the protocol

PFC feature mode
　　0　　Mobile station does not support BSS packet flow procedures
　　1　　Mobile station does support BSS packet flow procedures

GEA/2
　　0　　encryption algorithm GEA/2 not available
　　1　　encryption algorithm GEA/2 available

GEA/3
　　0　　encryption algorithm GEA/3 not available

1 encryption algorithm GEA/3 available

GEA/4
0 encryption algorithm GEA/4 not available
1 encryption algorithm GEA/4 available

GEA/5
0 encryption algorithm GEA/5 not available
1 encryption algorithm GEA/5 available

GEA/6
0 encryption algorithm GEA/6 not available
1 encryption algorithm GEA/6 available

GEA/7
0 encryption algorithm GEA/7 not available
1 encryption algorithm GEA/7 available

3GPP-CN1/SMG3WPA Meeting #12
Oahu/Hawaii, USA. 22-26 May, 2000

Document

CHANGE REQUEST

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

| | 24.008 | CR | 218r3 | Current Version: | 3.3.1 |

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

For submission to: TSG-CN#8 | for approval | **X** | | strategic | | *(for SMG*
list expected approval meeting # here ↑ | for information | | | non-strategic | | *use only)*

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

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

Source: NTC | **Date:** 00/05/23

Subject: Addition of "Cause of No CLI" IE in SETUP message

Work item: TEI

Category: | F Correction | | **Release:** | Phase 2 | |
| A Corresponds to a correction in an earlier release | | | Release 96 | |
(only one category | B Addition of feature | **X** | | Release 97 | |
shall be marked | C Functional modification of feature | | | Release 98 | |
with an X) | D Editorial modification | | | Release 99 | **X** |
| | | | Release 00 | |

Reason for change: In SA plenary meeting #7, it was agreed to make global solution about "Cause of No CLI" by June 2000. For N1, we propose to add new IE "Cause of No CLI" to SETUP message in TS24.008.

Clauses affected: 9.3.23, 10.5.4

Other specs Affected: | Other 3G core specifications | | → List of CRs: |
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

help.doc

<--------- double-click here for help and instructions on how to create a CR.

9.3.23   Setup

9.3.23.1   Setup (mobile terminated call establishment)

This message is sent by the network to the mobile station to initiate a mobile terminated call establishment.

See table 9.70/TS 24.008.

   Message type: SETUP

   Significance: global

   Direction: network to mobile station

Table 9.70/TS 24.008: SETUP message content (network to mobile station direction)

IEI	Information element	Type / Reference	Presence	Format	Length
	Call control Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Transaction identifier	Transaction identifier 10.3.2	M	V	1/2
	Setup Message type	Message type 10.4	M	V	1
D-	BC repeat indicator	Repeat indicator 10.5.4.22	C	TV	1
04	Bearer capability 1	Bearer capability 10.5.4.5	O	TLV	3-16
04	Bearer capability 2	Bearer capability 10.5.4.5	O	TLV	3-16
1C	Facility	Facility 10.5.4.15	O	TLV	2-?
1E	Progress indicator	Progress indicator 10.5.4.21	O	TLV	4
34	Signal	Signal 10.5.4.23	O	TV	2
5C	Calling party BCD Number	Calling party BCD num. 10.5.4.9	O	TLV	3-14
5D	Calling party sub- Address	Calling party subaddr. 10.5.4.10	O	TLV	2-23
5E	Called party BCD Number	Called party BCD num. 10.5.4.7	O	TLV	3-19
6D	Called party sub- Address	Called party subaddr. 10.5.4.8	O	TLV	2-23
74	Redirecting party BCD number	Redirecting party BCD num. 10.5.4.21a	O	TLV	3-19
75	Redirecting party sub-address	Redirecting party subaddress. 10.5.4.21b	O	TLV	2-23
D-	LLC repeat indicator	Repeat indicator 10.5.4.22	O	TV	1
7C	Low layer Compatibility I	Low layer comp. 10.5.4.18	O	TLV	2-18
7C	Low layer Compatibility II	Low layer comp. 10.5.4.18	C	TLV	2-18
D-	HLC repeat indicator	Repeat indicator 10.5.4.22	O	TV	1
7D	High layer Compatibility i	High layer comp. 10.5.4.16	O	TLV	2-5
7D	High layer Compatibility ii	High layer comp. 10.5.4.16	C	TLV	2-5
7E	User-user	User-user 10.5.4.25	O	TLV	3-35
8-	Priority	Priority Level 10.5.1.11	O	TV	1
19	Alert	Alerting Pattern 10.5.4.26	O	TLV	3
2F	Network Call Control Capabilities	Network Call Control cap. 10.5.4.x	O	TLV	3
3A	Cause of No CLI	Cause of No CLI 10.5.4.x	O	TLV	3

9.3.23.1.1   BC repeat indicator

The *BC repeat indicator* information element is included if and only if *bearer capability* 1 information element and *bearer capability 2* IE are both present in the message.

9.3.23.1.2   Bearer capability 1 and bearer capability 2

The *bearer capability 1* information element may be omitted in the case where the mobile subscriber is allocated only one directory number for all services (ref.: TS 29.007). The *bearer capability 2* IE is missing at least if the *bearer capability 1* IE is missing.

If the MSC wishes to indicate capability for an altenative call mode, which can be entered through fallback, this is indicated by adding a *bearer capability information ele*ment (bearer capability) 2 element (see section 5.3.6).

9.3.23.1.3   Facility

This information element may be included for functional operation of supplementary services.

9.3.23.1.4   Progress indicator

This information element is included by the network

- in order to pass information about the call in progress e.g. in the event of interworking and/or

- to make the MS attach the user connection for speech.

9.3.23.1.4a   Called party BCD number

For all bands except for PCS1900, the maximum length of this IE sent by the network shall be 13 octets

9.3.23.1.5   Called party subaddress

Included in the Network-to-mobile station direction if the calling user includes a *called party subaddress* information element in the SETUP message.

9.3.23.1.6   LLC repeat indicator

The *LLC repeat indicator* information element is included if and only if both following conditions hold:

- The *BC repeat indicator* IE is contained in the message.

- The *low layer compatibility I* IE is contained in the message.

If included, the *LLC repeat indicator* shall specify the same repeat indication as the *BC repeat indicator* IE.

9.3.23.1.7   Low layer compatibility I

Included in the network-to-mobile station direction if the calling user specified a low layer compatibility.

9.3.23.1.8   Low layer compatibility II

Included if and only if the *LLC repeat indicator* information element is contained in the message.

9.3.23.1.9   HLC repeat indicator

The *HLC repeat indicator* information element is included if and only both following conditions hold:

- The *BC repeat indicator* IE is contained in the message.

- The *high layer compatibility i* IE is contained in the message.

If included, the *HLC repeat indicator* shall specify the same repeat indication as the *BC repeat indicator* IE.

9.3.23.1.10   High layer compatibility i

Included in the network-to-mobile station direction if the calling user specified a high layer compatibility.

9.3.23.1.11   High layer compatibility ii

Included if and only if the *HLC repeat indicator* information element is contained in the message.

9.3.23.1.12   User-user

May be included in the network to called mobile station direction when the calling remote user included a user-user information element in the SETUP message.

9.3.23.1.13   Redirecting party BCD number

May be included in the network to called mobile station direction when the call has been redirected.

9.3.23.1.14   Redirecting party subaddress

May be included in the network to called mobile station direction when the calling remote user included a called party subaddress in the SETUP message and the call has been redirected

9.3.23.1.15   Priority

May be included by the network to indicate the priority of the incoming call if eMLPP is used.

9.3.23.1.16   Alert $(Network Indication of Alerting in the MS)$

May be included by the network to give some indication about alerting (category or level). If supported in the MS, this optional indication is to be used by the MS as specified in GSM 02.07.

9.3.23.1.17   Network Call Control Capabilities

This information shall be included by the network to indicate its call control capabilities if the network supports multicall.and there are no other ongoing calls to the MS.

9.3.23.1.xx   Cause of No CLI

This IE may be included by the network only when no number digits are contained within the Calling Party BCD IE.

When both Calling Party BCD number IE and Cause of No CLI IE are included in SETUP message then the Cause of No CLI IE provideds additional information on why the number digits are not present.

```
************************************************************************************
*                                   S K I P                                       *
************************************************************************************
```

10.5.4.xx   Cause of No CLI

Cause of No CLI information element provides the mobile station the detailed reason why Calling party BCD number is not notified only when Calling party BCD number digit is not included in SETUP message.

The *Cause of No CLI* information element is coded as shown in figure 10.5.xxx/TS 24.008 and table 10.5.xxx/TS 24.008

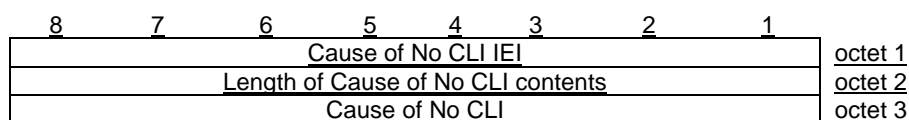The *Cause of No CLI i*s a type 4 information element with the length of 3 octets.

8	7	6	5	4	3	2	1	
Cause of No CLI IEI								octet 1
Length of Cause of No CLI contents								octet 2
Cause of No CLI								octet 3

Figure 10.5.xxx/TS 24.008 Cause of No CLI information element

Table 10.5.xxx/TS 24.008: Cause of No CLI information element

Cause of No CLI (octet 3)
Bits
8 7 6 5 4 3 2 1
0 0 0 0 0 0 0 0   Unavailable
0 0 0 0 0 0 0 1   Reject by user
0 0 0 0 0 0 1 0   Interaction with other service
0 0 0 0 0 0 1 1   Coin line/payphone
Other values shall be interpreted as "Unavailable".

Title:	**Liaison statement on Global solution of "Cause of no CLI"**
Source:	**TSG CN WG1**
TO:	**TSG SA WG1, TSG CN WG4**
WI:	**TEI**

Contact Person:
    Name:Katsunobu Ohtsuki
    E-mail Address:ohtsuki@mob.ntc.co.jp
    Tel. Number:+81-44-900-7311

Date: **23 May 2000**

_____

In N1, we considered global solution in 3GPP specifications regarding to "Cause of No CLI" to fulfil the requirement of TTC. As a result, N1 approved CR in N1-000750 (attached file).

The LS from S1 says, "It must be possible to indicate the coin line simultaneously with the other indications". However, the multiple "Cause of No CLI"s are not notified simultaneously in present TTC standards.
The definition in TTC that the multiple "Cause of No Id"s are notified simultaneously to MT user is defined for the future extension. This extension has not been implemented. The solution N1 is proposing can guarantee future extension.

We hope N4 can review this N1 proposal and to liaise back to N1 urgently whether the proposal is acceptable considering the N4 decisions on SS stage 2 and stage 3 specification under N4 control.

3GPP-CN1/SMG3WPA Meeting #12
Oahu/Hawaii, USA. 22-26 May, 2000

Document **N1-000755**
REV of Tdoc N1-000616
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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| **24.008** | CR | **189 r1** | Current Version: | 3.3.1 |

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

For submission to: **TSGN#8**
list expected approval meeting # here ↑

for approval   **X**   strategic ☐   *(for SMG*
for information   non-strategic ☐   *use only)*

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

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

| **Source:** | Ericsson | **Date:** | 23.05.00 |

| **Subject:** | DRX value 0000 clarification and R97 compatibility issue |

| **Work item:** | GSM/UMTS interworking |

Category:

(only one category shall be marked with an X)

F	Correction	**X**	**Release:**	Phase 2	☐
A	Corresponds to a correction in an earlier release			Release 96	☐
B	Addition of feature			Release 97	☐
C	Functional modification of feature			Release 98	☐
D	Editorial modification			Release 99	**X**
				Release 00	☐

Reason for change:
With Tdoc N1-000551 the MS specific DRX cycle length was introduced also for UMTS by using the remaing 4 spare bits for that CN specific DRX cycle length coefficient. Clarification is done to when system information value is used as well as only stating the default value for codings not used, for possible reuse of these values later on.
A R99 MS attached to R97 SGSN needs the MM context to be coded with this new field instead of spare coding at inter SGSN (R99) RAU. So the note is expanded with this.

Clauses affected: 10.5.5.6

Other specs affected:

Other 3G core specifications	☐	→ List of CRs:	
Other GSM core specifications	☐	→ List of CRs:	
MS test specifications	☐	→ List of CRs:	
BSS test specifications	☐	→ List of CRs:	
O&M specifications	☐	→ List of CRs:	

Other comments:

<--------- double-click here for help and instructions on how to create a CR.

10.5.5.6   DRX parameter

The purpose of the *DRX parameter* information element is to indicate whether the MS uses DRX mode or not.

The *DRX parameter* is a type 3 information element with a length of 3 octets.

The value part of a *DRX parameter* information element is coded as shown in table 10.5.139/TS 24.008.

```
     8      7      6      5      4      3      2      1
```

8 7 6 5 4 3 2 1	
DRX parameter IEI	octet 1
SPLIT PG CYCLE CODE	octet 2
CN Specific DRX cycle length coefficient | SPLIT on CCCH | non-DRX timer	octet 3

Figure 10.5.122/TS 24.008: DRX parameter information element

Table 10.5.139/TS 24.008: DRX parameter information element

```
SPLIT PG CYCLE CODE, octet 2
The octet contains the binary coded value of the SPLIT PG CYCLE
CODE. The SPLIT PG CYCLE value is derived from the SPLIT PG
CYCLE CODE as follows:

SPLIT PG CYCLE CODE       SPLIT PG CYCLE value
0                         704 (equivalent to no DRX)
1 to 64                         1 to 64, respectively
65                        71
66                        72
67                        74
68                        75
69                        77
70                        79
71                        80
72                        83
73                        86
74                        88
75                        90
76                        92
77                        96
78                        101
79                        103
80                        107
81                        112
82                        116
83                        118
84                        128
85                        141
86                        144
87                        150
```

```
88                   160
89                   171
90                   176
91                   192
92                   214
93                   224
94                   235
95                   256
96                   288
97                   320
98                   352
```

All other values are reserved and shall be interpreted as 1 by this version of the protocol.

SPLIT on CCCH, octet 3 (bit 4)

0 Split pg cycle on CCCH is not supported by the mobile station
1 Split pg cycle on CCCH is supported by the mobile station

```
non-DRX timer, octet 3
bit
3 2 1
0 0 0     no non-DRX mode after transfer state
0 0 1     max.  1 sec non-DRX mode after transfer state
0 1 0     max.  2 sec non-DRX mode after transfer state
0 1 1     max.  4 sec non-DRX mode after transfer state
1 0 0     max.  8 sec non-DRX mode after transfer state
1 0 1     max. 16 sec non-DRX mode after transfer state
1 1 0     max. 32 sec non-DRX mode after transfer state
1 1 1     max. 64 sec non-DRX mode after transfer state


CN Specific DRX cycle length coefficient, octet 3
bit
8 7 6 5   (UMTS only)

0 0 0 0   CN Specific DRX cycle length coefficient not specified
          by the MS, ie. the system information value 'CN domain
          specific DRX cycle length' is used. (Ref TS 25.331)
0 0 0 1   Reserved
0 0 1 0   CN Specific DRX cycle length coefficient = 2
0 0 1 1   CN Specific DRX cycle length coefficient = 3
0 1 0 0   CN Specific DRX cycle length coefficient = 4
0 1 0 1   CN Specific DRX cycle length coefficient = 5
0 1 1 0   CN Specific DRX cycle length coefficient = 6
0 1 1 1   CN Specific DRX cycle length coefficient = 7
1 0 0 0   CN Specific DRX cycle length coefficient = 8
1 0 0 1   CN Specific DRX cycle length coefficient = 9
1 0 1 0   CN Specific DRX cycle length coefficient = 10
1 0 1 1   CN Specific DRX cycle length coefficient = 11
1 1 0 0   CN Specific DRX cycle length coefficient = 12
1 1 0 1   Reserved
1 1 1 0   Reserved
1 1 1 1   Reserved
```

All other reserved values shall be interpreted as "CN Specific DRX cycle length coefficient not specified by the MS" by this version of the protocol.

Note: In UMTS Tthis field (octet 3 bits 8 to 5) is used, but was spare in earlier versions of this protocol only for UMTS RAN.

To: 3GPP SA2
Copy:

From: 3GPP CN1

Contact: Sudeep Palat
Tel: +44-1793-736180
Fax: +44-1793-883815
Email: spalat@lucent.com

LS on Removal of Service Accept

A CR (attached) has been presented to CN1 with the intention of aligning 24.008 with 23.060 on the subject of the removal of the Service Accept message.

CN1 is currently discussing this topic. CN1 agree that keeping the principle of protocol layering is important and should be maintained whenever possible. Some delegates consider this principle more important than the reasons for the change that were identified during CN1 meeting. The removal of an explicit Service Accept introduces complex interaction between different protocol layers e.g. GMM, SM and Lower layers (RAB setup etc) and could lead to problems. However, to continue discussion on the protocol issues further, CN1 would like to understand the reason for S2's decision on removal of Service Accept from the protocol architecture veiwpoint and the benefits for doing so.

CN1 is unable to agree on this issue and asks S2 if they see any problems in re-introducing Service Accept message.

CHANGE REQUEST

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

| 24.008 | CR | 206 | | Current Version: | 3.3.1 |

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

For submission to: **TSG CN#8**
list expected approval meeting # here ↑

| For approval | X | | strategic | | *(for SMG* |
| for information | | | non-strategic | | *use only)* |

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

Proposed change affects:
(at least one should be marked with an X)

(U)SIM | | ME **X**   UTRAN / Radio | | Core Network **X**

| **Source:** | Ericsson | **Date:** | 2000-05-17 |

| **Subject:** | Removal of Service Accept message |

| **Work item:** | GSM-UMTS Interworking |

Category:

(only one category shall be marked with an X)

F	Correction	**X**	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	**X**
				Release 00	

| **Reason for change:** | This CR proposes to remove the Service Accept message as it is not needed and to be aligned with TS 23.060. |

| **Clauses affected:** | |

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

| **Other comments:** | Annex A: cut out from 23.060 |

4.7.13   Service Request procedure (UMTS only)

The purpose of this procedure is to transfer the PMM mode from PMM-IDLE to PMM-CONNECTED mode, and/or to assign radio access bearer in case of PDP contexts are activated without radio access bearer assigned. In latter case, the PMM mode may be PMM-IDLE or PMM-CONNECTED mode. This procedure is used for;

-       the initiation of CM layer service (e.g. SM or SMS) procedure from the MS in PMM-IDLE mode.

-       the network to transfer down link signalling,

-       uplink and downlink user packet.

For downlink transfer of signalling or user packet, the trigger is given from the network by the paging request procedure, which is out of scope of this specification.

Service type can take either of the following values, "signalling", "data" or "paging response". Each of the values shall be selected according to the criteria to initiate the Service request procedure.

The criteria to invoke the Service request procedure are when;

a)   the MS has any signalling message, that requires security protection, to be sent to the network in PMM-IDLE mode (i.e., no secure PS signalling connection has been established). In this case, the service type shall be set to "signalling".

b)   the MS, either in PMM-IDLE and PMM-CONNECTED mode, has pending user packet to be sent and no radio access bearer is established for the PDP context. The procedure is initiated by an indication from the lower layers (see TS 24.007). In this case, the service type shall be set to "data".

c)   the MS receives a paging request for PS domain from the network in PMM-IDLE mode. In this case, the service type shall be set to "paging response".

After completion of a Service request procedure, the pending service is resumed and uses then the connection established by the procedure. If the service type is indicating "data", then the radio access bearers for all the activated PDP contexts are re-established. The selective re-assignment capability is not supported for the simplicity of the function.

4.7.13.1   Service Request procedure initiation

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

4.7.13.2   GMM common procedure initiation

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

4.7.13.3   Service request procedure accepted by the network

If the Service Request Procedure was initiated when the MS is in PMM-IDLE mode, then ~~A~~an indication from the lower layers (see 24.007) that the security mode ~~setting~~ control procedure is completed~~, or reception of a SERVICE ACCEPT message~~, shall be treated as a successful completion of the procedure. If the Service Request Procedure was initiated when MS is in PMM-CONNECTED mode, then an indication from the lower layers (see TS 24.007) that a Radio Bearer Setup message has been received or PDP Context has been deactivated or modified, shall be treated as a completion of the procedure when the Service Type indicates 'data'. The timer T3317 shall be stopped, and the MS enters GMM-REGISTERED state and PMM-CONNECTED mode.

If the MS is in PMM-CONNECTED mode, then an expiry of the timer T3317 shall be treated as a completion of the service request procedure and the MS shall enter GMM-REGISTERED state.

NOTE: If the MS initiated a Service Request procedure with Service Type 'data' and all the radio access bearers was not successfully set up, then it is an implementation issue in the MS whether it initiates a new Service Request procedure with Service Type 'data'.

4.7.13.4　Service request procedure not accepted by the network

- If the Service request cannot be accepted, the network returns a SERVICE REJECT message to the mobile station. An MS that receives a SERVICE REJECT message stops timer T3317. The MS shall then take different actions depending on the received reject cause value:

     # 3　　　(Illegal MS); or

     # 6　　　(Illegal ME)

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

- A GPRS MS operating in MS operation mode A shall in addition set the update status to U3 ROAMING NOT ALLOWED, shall delete any TMSI, LAI and ~~GPRS~~ ciphering key sequence number. The new MM state is MM IDLE. The SIM shall be considered as invalid also for non-GPRS services until switching off or the SIM 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 section 4.1.3.2.9) and shall delete any P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number. The SIM shall be considered as invalid for GPRS services until switching off or the SIM is removed. The new state is GMM-DEREGISTERED.

     # 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 section 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.

     # 10　　　(Implicitly detached)

- 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 contexts.

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

     # 11　　　(PLMN not allowed);

     # 12　　　(Location area not allowed); or

     # 13　　　(Roaming not allowed in this location area)

- 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 section 4.1.3.2) and enter the state GMM-DEREGISTERED.

- A GPRS MS operating in MS operation mode A shall in addition set the update status to U3 ROAMING NOT ALLOWED and shall delete any TMSI, LAI and ~~GPRS~~ ciphering key sequence number. The new MM state is MM IDLE.

- The MS shall store the LAI or the PLMN identity in the appropriate forbidden list, i.e. in the "forbidden PLMN list" for cause #11, in the list of "forbidden location areas for regional provision of service" for cause #12 or in the list of "forbidden location areas for roaming" for cause #13. If #11or #13 was received, the MS shall perform a PLMN selection instead of a cell selection.

     # 40　　　(No PDP context activated)

- The MS shall deactivate locally all active PDP contexts and the MS shall enter the state GMM-REGISTERED.NORMAL-SERVICE. The MS may also activate PDP context(s) to replace any previously active PDP contexts.

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

Other values are considered as abnormal cases. The specification of the MS behaviour in those cases is described in section 4.7.13.5.

4.7.13.5 Abnormal cases in the MS

The following abnormal cases can be identified:

a) Access barred because of access class control

The Service request procedure shall not be started. The MS stays in the current serving cell and applies normal cell reselection process. The Service request procedure may be started by CM layer if it is still necessary, i.e. when access is granted or because of a cell change.

b) Lower layer failure before the security mode ~~setting~~ control procedure is completed, the Radio Bearer Setup message is received ~~SERVICE ACCEPT~~ or the SERVICE REJECT message is received

The procedure shall be aborted.

c) T3317 expired

If the MS is in PMM-IDLE mode then ~~T~~the procedure shall be aborted and the MS shall initiate a PS signalling connection release.

d) SERVICE REJECT received other causes than those treated in section 4.7.x.4

The procedure shall be aborted.

e) Routing area update procedure is triggered

If a cell change into a new routing area occurs and the necessity of routing area update procedure is determined before the security mode ~~setting~~ control procedure is completed~~,~~ or the Radio Bearer Setup message has been received ~~a SERVICE ACCEPT~~ or SERVICE REJECT message has been received, the Service request procedure shall be aborted and the routing area updating procedure is started immediately. Follow-on request pending may be indicated in the ROUTING AREA UPDATE REQUEST for the service, which was the trigger of the aborted Service request procedure, to restart the pending service ifself or the Service Request procedure after the completion of the routing area updating procedure. If the service type of the aborted SERVICE REQUEST was indicating "data", then the routing area update procedure may be followed by a re-initiated Service request procedure indicating "data", if it is still necessary.

f) Power off

If the MS is in state GMM-SERVICE-REQUEST-INITIATED at power off, the GPRS detach procedure shall be performed.

g) Procedure collision

If the MS receives a DETACH REQUEST message from the network in state GMM-SERVICE-REQUEST-INITIATED, the GPRS detach procedure shall be progressed and the Service request procedure shall be aborted. If the cause IE, in the DETACH REQUEST message, indicated a "reattach request", the GPRS attach procedure shall be performed.

4.7.13.6 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 security mode ~~setting~~ control procedure is completed or the RAB setup procedure is completed~~a SERVICE ACCEPT~~ or SERVICE REJECT message has been sent to the MS, the network enters~~stays in~~ PMM-IDLE.

b) Protocol error

If the SERVICE REQUEST message is received with a protocol error, the network shall return a SERVICE 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.

The network stays in PMM-IDLE mode.

c.1) SERVICE REQUEST received

-   If one or more of the information elements in the SERVICE REQUEST message differ from the ones received within the previous SERVICE REQUEST message, the previously initiated Service request procedure shall be aborted and the new Service request procedure shall be progressed, or.

-   If no information element differ, then the SERVICE ACCEPT message shall be resent.

c.2) More than one SERVICE REQUEST received and the procedure has not been completed (i.e., the security mode setting control procedure has not been completed or the RAB Setup procedure has not been completed SERVICE ACCEPT, or SERVICE REJECT message has not been sent),

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

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

d) ATTACH REQUEST received before the security mode setting control procedure has been completed or the RAB Setup procedure has not been completed an SERVICE ACCEPT or an SERVICE REJECT message has been sent.

If an ATTACH REQUEST message is received and the security mode setting control procedure has not been completed or an SERVICE ACCEPT the RAB Setup procedure has not been completed or an SERVICE REJECT message has not been sent, the network may initiate the GMM common procedures, e.g. the GMM authentication and ciphering procedure. The network may e.g. after a succesful GMM authentication and ciphering procedure execution, abort the Service request procedure, the GMM context and PDP contexts, if any, are deleted and the new ATTACH REQUEST is progressed.

e) ROUTING AREA UPDATE REQUEST message received before the security mode setting control procedure has been completed or the RAB Setup procedure has been completed an SERVICE ACCEPT or an SERVICE REJECT message has been sent

If an ROUTING AREA UPDATE REQUEST message is received and the security mode setting control procedure has not been completed or the RAB Setup procedure has not been completedan SERVICE ACCEPT or an SERVICE REJECT message has not been sent, the network may initiate the GMM common procedures, e.g. the GMM authentication and ciphering procedure. The network may e.g. after a successful GMM authentication and ciphering procedure execution, abort the Service request procedure and progress the routing area update procedure.

f) If the Service Type indicates 'data' and the network fails to re-establish some or all RAB(s) then the SGSN may determines if PDP Context Modification or PDP Context Deactivation should be initiated.
   The appropriate action depends on the QoS profile of the PDP Context and is an operator choice.

*** Next Modification ***

9.4.21 Void Service Accept (UMTS only)

This message is sent by the network in response to a *Service Request* message. See table 9.4.21/TS 24.008.
   Message type:Service Accept

   Significance: dual

   Direction: network to MS

9.4.22 Service Reject (UMTS only)

This message is sent by the network to the UE in order to reject the Service request procedure. See table 9.4.22/TS 24.008.

Message type: Service ~~Accept~~ Reject

Significance: dual

Direction: network to MS

Table 9.4.22/TS 24.008: Contents of Service Reject message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip indicator	Skip indicator 10.3.1	M	V	1/2
	Service Reject	Message type 10.4	M	V	1
	GMM cause	GMM cause 10.5.5.14	M	V	1

*** Next Modification ***

11.2.2   Timers of GPRS mobility management

Table 11.3/TS 24.008: GPRS Mobility management timers - MS side

TIMER NUM.	TIMER VALUE	STATE	CAUSE OF START	NORMAL STOP	ON THE 1st, 2nd, 3rd, 4th EXPIRY Note 3
T3310	15s	GMM-REG-INIT	ATTACH REQ sent	ATTACH ACCEPT received ATTACH REJECT received	Retransmission of ATTACH REQ
T3311	15s	GMM-DEREG ATTEMPTING TO ATTACH or GMM-REG ATTEMPTING TO UPDATE	ATTACH REJ with other cause values as described in chapter 'GPRS Attach' ROUTING AREA UPDATE REJ with other cause values as described in chapter 'Routing Area Update' Low layer failure	Change of the routing area	Restart of the Attach or the RAU procedure with updating of the relevant attempt counter
T3321	15s	GMM-DEREG-INIT	DETACH REQ sent	DETACH ACCEPT received	Retransmission of the DETACH REQ
T3330	15s	GMM-ROUTING-UPDATING-INITIATED	ROUTING AREA UPDATE REQUEST sent	ROUTING AREA UPDATE ACC received ROUTING AREA UPDATE REJ received	Retransmission of the ROUTING AREA UPDATE REQUEST message

Table 11.3a/TS 24.008: GPRS Mobility management timers – MS side

TIMER NUM.	TIMER VALUE	STATE	CAUSE OF START	NORMAL STOP	ON EXPIRY
T3302	Default 12 min Note 1	GMM-DEREG or GMM-REG	At attach failure and the attempt counter is greater than or equal to 5. At routing area updating failure and the attempt counter is greater than or equal to 5.	At successful attach At successful routing area updating	On every expiry, initiation of the GPRS attach procedure Or RAU procedure
T3312	Default 54 min Note1	GMM-REG	In GSM, when READY state is left. In UMTS, when PMM-CONNECTED mode is left.	When entering state GMM-DEREG	Initiation of the Periodic RAU procedure
T3314 READY (GSM only)	Default 44 sec Note 2	All except GMM-DEREG	Transmission of a PTP PDU	Forced to Standby	No cell-updates are performed
T3317 (UMTS only)	10s	GMM-REG	SERVICE REQ sent	Security mode ~~setting~~ control procedure is completed, ~~SERVICE ACCEPT received,~~ or a Radio Bearer Setup message is received, or PDP-context has been deactivated or modified, ~~or~~or SERVICE REJECT received	Abort the procedure

NOTE 1: The value of this timer is used if the network does not indicate another value in a GMM signalling procedure.

NOTE 2: The default value of this timer is used if neither the MS nor the Network send another value, or if the Network sends this value, in a signalling procedure.

NOTE 3: Typically, the procedures are aborted on the fifth expiry of the relevant timer. Exceptions are described in the corresponding procedure description.

Table 11.4/TS 24.008: GPRS Mobility management timers - network side

TIMER NUM.	TIMER VALUE	STATE	CAUSE OF START	NORMAL STOP	ON THE 1st, 2nd, 3rd, 4th EXPIRY Note 3
T3322	6s	GMM-DEREG-INIT	DETACH REQ sent	DETACH ACCEPT received	Retransmission of DETACH REQUEST
T3350	6s	GMM-COMMON-PROC-INIT	ATTACH ACCEPT sent with P-TMSI and/or TMSI RAU ACCEPT sent with P-TMSI and/or TMSI P-TMSI REALLOC COMMAND sent	ATTACH COMPLETE received RAU COMPLETE received P-TMSI REALLOC COMPLETE received	Retransmission of the same message type, i.e. ATTACH ACCEPT, RAU ACCEPT or REALLOC COMMAND
T3360	6s	GMM-COMMON-PROC-INIT	AUTH AND CIPH REQUEST sent	AUTH AND CIPH RESPONSE received AUTHENT- AND CIPHER- FAILURE received	Retransmission of AUTH AND CIPH REQUEST Procedural behaviour is FFS
T3370	6s	GMM-COMMON-PROC-INIT	IDENTITY REQUEST sent	IDENTITY RESPONSE received	Retransmission of IDENTITY REQUEST

Table 11.4a/TS 24.008: GPRS Mobility management timers - network side

TIMER NUM.	TIMER VALUE	STATE	CAUSE OF START	NORMAL STOP	ON EXPIRY
T3313	Note1	GMM_REG	Paging procedure initiated	Paging procedure completed	Network dependent
T3314 READY (GSM only)	Default 44 sec Note 2	All except GMM-DEREG	Receipt of a PTP PDU	Forced to Standby	The network shall page the MS if a PTP PDU has to be sent to the MS
Mobile Reachable	Default 4 min greater than T3312	All except GMM-DEREG	In GSM, change from READY to STANDBY state In UMTS, change from PMM-CONNECTED mode to PMM-IDLE mode.	PTP PDU received	Network dependent but typically paging is halted on 1st expiry

NOTE 1: The value of this timer is network dependent.

NOTE 2: The default value of this timer is used if neither the MS nor the Network send another value, or if the Network sends this value, in a signalling procedure. The value of this timer should be slightly shorter in the network than in the MS, this is a network implementation issue.

NOTE 3: Typically, the procedures are aborted on the fifth expiry of the relevant timer. Exceptions are described in the corresponding procedure description.

*** Annex A, chapter 6.12.1 from TS 23.060 ver. 3.3.0 ***

6.12.1 Service Request Initiated by MS Procedure

The MS in PMM-IDLE state sends the Service Request message to the 3G-SGSN in order to establish the PS signalling connection for the upper layer signalling or for the resource reservation for active PDP context(s). After receiving the Service Request message the 3G-SGSN may perform authentication and it shall perform the security mode procedure. After the establishment of the secure PS signalling connection to a 3G-SGSN the MS may send signalling messages, e.g., Activate PDP Context Request, to the 3G-SGSN, or the 3G-SGSN may start the resource reservation for the active PDP contexts depending on the requested service in the Service Request message. This procedure is also used by an MS in PMM-CONNECTED state to request the resource reservation for the active PDP contexts.
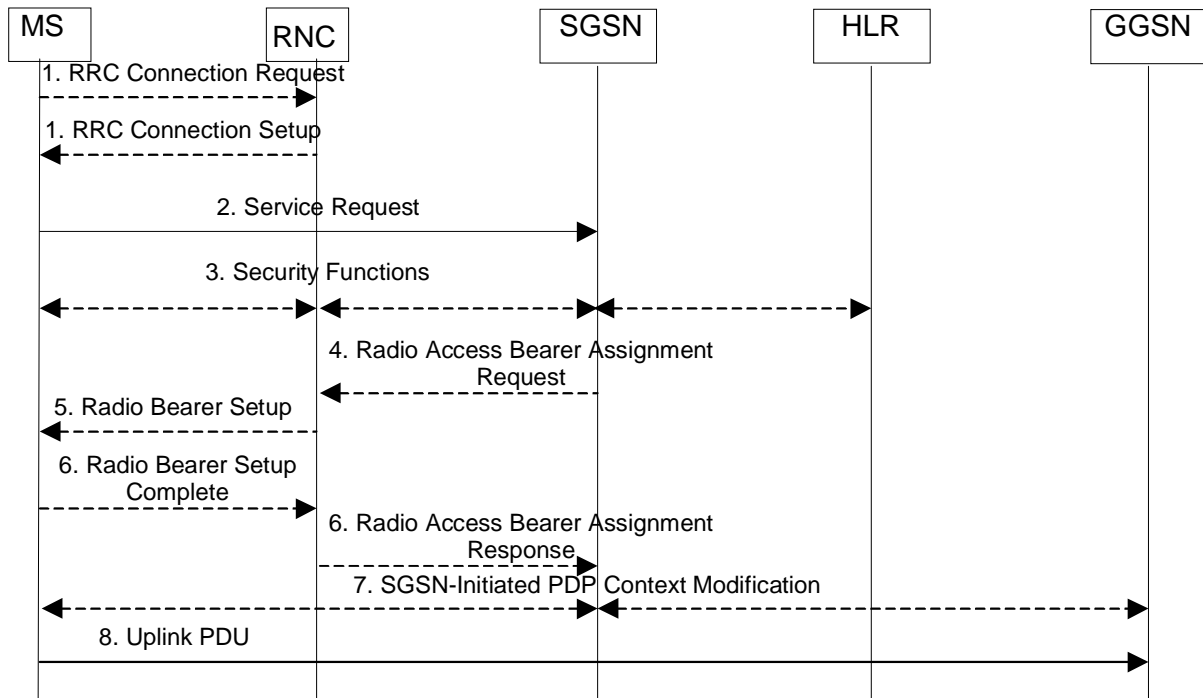

Figure 1: Service Request Initiated by MS Procedure

1) The MS establishes an RRC connection, if none exists for CS traffic.

2) The MS sends a Service Request (P-TMSI, RAI, CKSN, Service Type) message to the SGSN. Service Type specifies the requested service. Service Type shall indicate one of the following: Data or Signalling. At this point, the SGSN may perform the authentication procedure.

   If Service Type indicates Data then a signalling connection is established between the MS and the SGSN, and resources for active PDP context(s) are allocated, i.e., RAB establishment for the activated PDP context(s).

   If Service Type indicates Signalling then the signalling connection is established between the MS and the SGSN for sending upper-layer signalling messages, e.g., Activate PDP Context Request. The resources for active PDP context(s) are not allocated.

3) The SGSN shall perform the security functions if the service request was initiated by an MS in PMM-IDLE state.

4) In case Service Type indicates Data, the SGSN sends a Radio Access Bearer Assignment Request (NSAPIRAB ID(s), TEID(s), QoS Profile(s), SGSN IP Address(es)) message to re-establish radio access bearer for every activated PDP context.

5) The RNC indicates to the MS the new Radio Bearer Identity established and the corresponding RAB ID with the RRC radio bearer set up procedure.

6) SRNC responds with the Radio Access Bearer Assignment Response (RAB ID(s), TEID(s), QoS Profile(s), RNC IP Address(es)) message. The GTP tunnel(s) are established on the Iu interface. If the RNC returns a Radio Access Bearer Assignment Response message with a cause indicating that the requested QoS profile(s) can not be provided, e.g., "Requested Maximum Bit Rate not Available", then the SGSN may send a new Radio Access Bearer Assignment Request message with different QoS profile(s). The number of re-attempts, if any, as well as how the new QoS profile(s) values are determined is implementation dependent.

7) For each RAB re-established with a modified QoS profile, the SGSN initiates a PDP Context Modification procedure to inform the MS and the GGSN of the new negotiated QoS profile for the corresponding PDP context.

8) The MS sends the uplink packet.

For Service Type = Signalling, the MS knows that the Service Request message was successfully received in the SGSN when the MS receives the RRC Security Mode Control Command message.
For Service Type = Data, the MS knows that the Service Request was successfully received when the MS receives the Radio Bearer Setup message from the RNC.
For any Service Type, in case the service request cannot be accepted, the network returns a Service Reject message to the MS with an appropriate cause value.
For Service Type = Data, in case the SGSN fails to re-establish RAB(s) for the PDP context(s), the SGSN determines if an SM procedure, such as SGSN-Initiated PDP Context Modification or PDP Context Deactivation, should be initiated. The appropriate action depends on the QoS profile of the PDP context and is an operator choice.

3GPP CN WG1 Meeting #12

Hawaii, USA, 22- 26 May 2000

Document ~~N1-000726~~
N1-000763
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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

24.007	**CR**	**A014r2**	Current Version:	**3.3.1**	

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

For submission to:	CN #8	for approval	**X**	Strategic		*(for SMG*
list expected approval meeting # here ↑		for information		non-strategic		*use only)*

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

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

Source:	Ericsson/Siemens	**Date:**	2000-05-18

Subject:	Change of the GMM Ready Timer behaviour

Work item:	GPRS

Category:	F	Correction	**X**	**Release:**	Phase 2	
	A	Corresponds to a correction in an earlier release			Release 96	
(only one category	B	Addition of feature			Release 97	
shall be marked	C	Functional modification of feature			Release 98	
with an X)	D	Editorial modification			Release 99	**X**
					Release 00	

| **Reason for change:** | The MS/SGSN shall restart the GMM READY timer at transmission/reception of any LLC frame, including an LLC frame without an information field transmitted in order to perform cell update.

If the user is travelling around in an urban area, where the cell size is small, the READY timer will be restarted, even if there is no active user-data transmission. Thus, the MS and SGSN will remain in GMM ready state for considerably longer than is necessary, and the MS will continue to perform cell updates.

Frequent cell updates will lead to:
- increase of network load;
- waste of radio resources;
- significant increase of MS battery consumption, due to increased signalling and time spent in non-DRX mode.

In order to overcome this problem, it is proposed to introduce an optional cell update procedure where the READY timer will not be started if the LLC frame transmitted (by the MS)/received (by the SGSN) contains a cell update.

This proposed change is optional for both the network and the MS. |
|---|---|

Clauses affected:	Annex C

Other specs affected:	Other 3G core specifications		→ List of CRs:	
	Other GSM core specifications		→ List of CRs:	
	MS test specifications		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other	The proposed solution introduces a "Cell Notification" (which is in fact an optimised Cell

comments: Update Procedure) into MS and SGSN. The possibility to use the Cell Notification will be indicated by the network and shall be used by the MS when the MS does support it. The update will be triggered by the LLC NULL frame (introduced in 04.64) which is only allowed to be send by the MS if the network indicates the Cell Notification.

The feature is mandatory for R99 but a R99 network must be able to handle pre R99 MS which do not support Cell Notification.

Indication of the Cell Notification

A new, optional information element (optional on syntax level but on semantic level mandatory for R99) is introduced into the ATTACH ACCEPT and ROUTING AREA UPDATE ACCEPT message to indicate the ability of the network to support the Cell Notification.

If both the MS and SGSN support the Cell Notification, and the ATTACH ACCEPT message or ROUTING AREA UPDATE ACCEPT message contains a new value of the READY timer, the MS shall send any LLC frame except the LLC NULL frame in order to start the READY timer (LLC NULL frame can not be sent because it does not trigger the start of the READY timer).
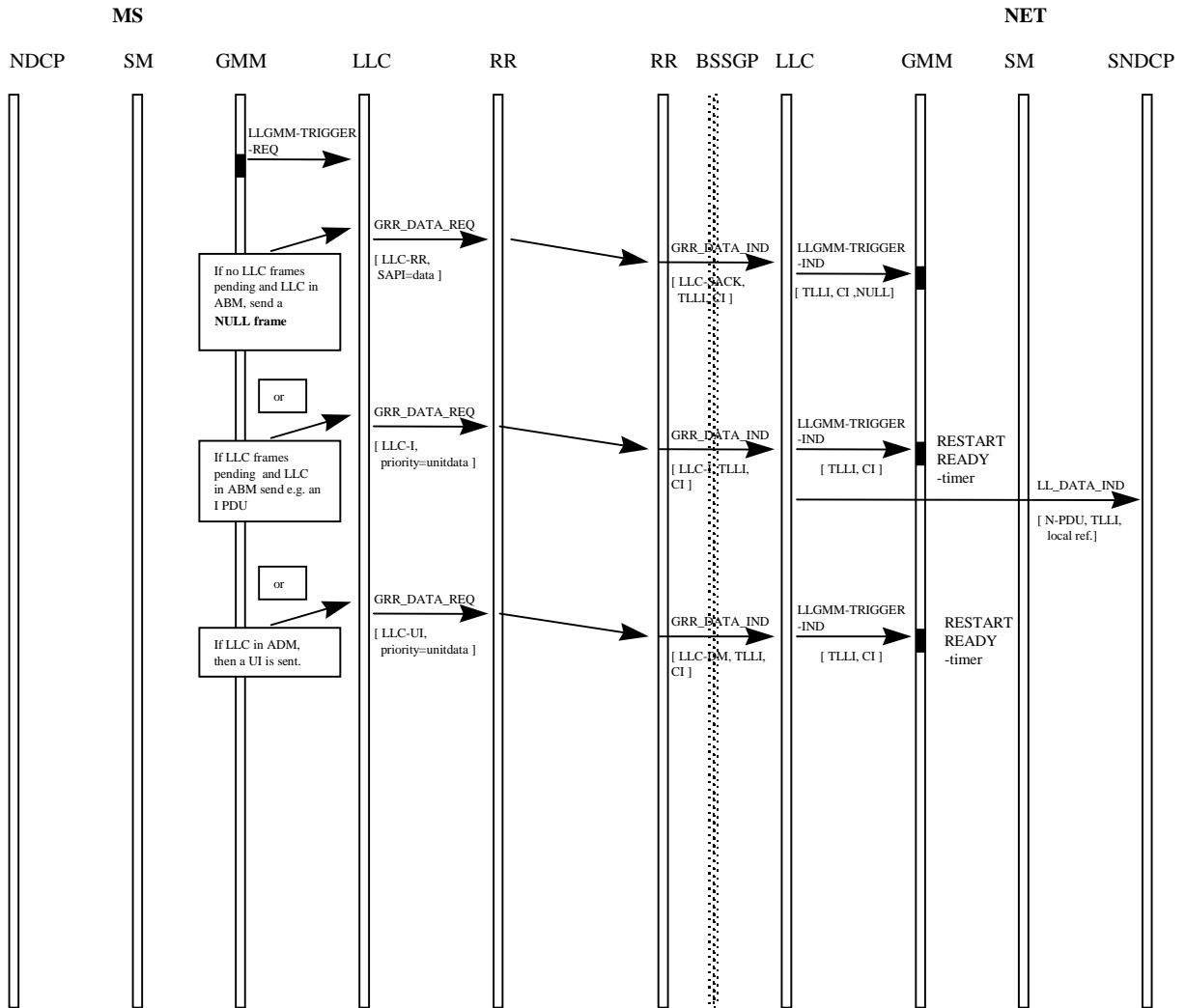
Behaviour at Cell Notification (new cell is entered)

A LLC NULL frame is introduced at the LLC layer. If both the MS and SGSN support the Cell Notification, an MS shall transmit the LLC NULL frame in order to indicate a cell change to the network. The MS shall not start the READY timer as a result of transmitting the LLC NULL frame. Similarly, the SGSN shall not start the READY timer as a result of receiving LLC NULL frame.

Further:

An MS shall not transmit LLC NULL frame as a response to paging for PS services. If the MS does not support the Cell Notification but the SGSN indicates the ability to support them then the behaviour at cell update remains as currently specified.

C.18 CELL Notification

MS   **NET**

NDCP	SM	GMM	LLC	RR	RR	BSSGP	LLC	GMM	SM	SNDCP

LLGMM-TRIGGER-REQ

GRR_DATA_REQ
[LLC-RR, SAPI=data]

GRR_DATA_IND
[LLC-SACK, TLLI, CI]

LLGMM-TRIGGER-IND
[TLLI, CI ,NULL]

If no LLC frames pending and LLC in ABM, send a **NULL frame**

or

GRR_DATA_REQ
[LLC-I, priority=unitdata]

If LLC frames pending and LLC in ABM send e.g. an I PDU

GRR_DATA_IND
[LLC-I, TLLI, CI]

LLGMM-TRIGGER-IND
[TLLI, CI]

RESTART READY-timer

LL_DATA_IND
[N-PDU, TLLI, local ref.]

or

GRR_DATA_REQ
[LLC-UI, priority=unitdata]

If LLC in ADM, then a UI is sent.

GRR_DATA_IND
[LLC-UM, TLLI, CI]

LLGMM-TRIGGER-IND
[TLLI, CI]

RESTART READY-timer

No further changes.

3GPP CN WG1 Meeting #12
Hawaii, USA, 22.-26. May 2000

Document *N1-000779* ~~N1-000627~~

e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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24.008	CR	192r1	Current Version:	3.3.1

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

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

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

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

Source:	Nokia		**Date:**	24.5.2000

Subject:	Change of IMEI coding from BCD to hexadecimal.

Work item:	TEI

Category: F   Correction
(only one category shall be marked with an X)
A   Corresponds to a correction in an earlier release
B   Addition of feature
C   Functional modification of feature   **[X]**
D   Editorial modification

Release: Phase 2
Release 96
Release 97
Release 98
Release 99   **[X]**
Release 00

Reason for change:

The current IMEI message structure is proposed to be changed to allow use of hexadecimal coding in addition of current BCD. The change is proposed in 3GPP TSG-CN,TSG-S, TSG-T and TSG-R to allow 16.7 million mobile terminals to be produced with one Type Approval Code. The current restriction for one million units per TAC is already a problem in the GSM terminal manufacturing and can only be predicted to worsen in the future.
Change to use hexadecimal coding is most simple since it does not affect to existing message lengths in GSM air interface and network interfaces.
In case of CN WG1, the change is only required to the table describing IMEI coding. IMEI is used for those UE's that have active emergency call without or with a defective USIM module. The change does not affect to message/information element length since BCD (actually TBCD) and hexadecimal digit coding consume equal amount of bits. In the MAP protocol, the only issue is to not use any 'sanity' check for this information element and allow all 4-bit binary values for all 15 digits of IMEI. The old IMEI coding in GSM system is fully backwards compatible with the changed coding for the message interface. (Depending on CN implementation it may be necessary to change the IMEI database control software. Note that in the MAP protocol the TBCD coding has been used for IMEI – in practise currently the coding is BCD, since IMEI is not using any of the special TBCD values ['*'=1010, '#'=1011, 'a'=1100, 'b'=1101, 'c'=1110]) The TBCD coding in MAP/RANAP for IMEI is technically only ruling out the use of code 'F' for the IMEI digits, this highlights further how small change in the message interface is proposed.

Clauses affected:	section 10.5.1.3 and 10.5.1.4

Other specs Affected:

Other 3G core specifications	[ ]	→ List of CRs:	
Other GSM core specifications	[ ]	→ List of CRs:	
MS test specifications	[ ]	→ List of CRs:	
BSS test specifications	[ ]	→ List of CRs:	
O&M specifications	[ ]	→ List of CRs:	

Other comments:

Table 10.5.3/TS 24.008: *Location Area Identification* **information element**

MCC, Mobile country code (octet 2 and 3)
The MCC field is coded as in ITU-T Rec. E212, Annex A.

If the LAI is deleted the MCC and MNC shall take the value from the deleted LAI.

In abnormal cases, the MCC stored in the mobile station can contain elements not in the set {0, 1 ... 9}. In such cases the mobile station should transmit the stored values using full hexadecimal encoding. When receiving such an MCC, the network shall treat the LAI as deleted.

MNC, Mobile network code (octet 3 bits 5 to 8, octet 4)
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. For PCS 1900 for NA, Federal regulation mandates that a 3-digit MNC shall be used. However a network operator may decide to use only two digits in the MNC in the LAI over the radio interface. In this case, bits 5 to 8 of octet 3 shall be coded as "1111". Mobile equipment shall accept LAI coded in such a way.

Note 1:   In earlier versions of this protocol, the possibility to use a one digit MNC in LAI was provided on the radio interface. However as this was not used this possibility has been deleted.

Note 2:   In earlier versions of this protocol, bits 5 to 8 of octet 3 were coded as "1111". Mobile equipment compliant with these earlier versions of the protocol may be unable to understand the 3-digit MNC format of the LAI, and therefore unable to register on a network broadcasting the LAI in this format.

In abnormal cases, the MNC stored in the mobile station can have:
-                 digit 1 or 2 not in the set {0, 1 ... 9}, or
-                 digit 3 not in the set {0, 1 ...9, F} hex.
In such cases the mobile station shall transmit the stored values using full hexadecimal encoding. When receiving such an MNC, the network shall treat the LAI as deleted.

The same handling shall apply for the network, if a 3-digit MNC is sent by the mobile station to a network using only a 2-digit MNC.

LAC, Location area code (octet 5 and 6)
In the LAC field bit 8 of octet 5 is the most significant bit and bit 1 of octet 6 the least significant bit.
The coding of the location area code is the responsibility of each administration except that two values are used to mark the LAC, and hence the LAI, as deleted. Coding using full hexadecimal representation may be used. The location area code consists of 2 octets.
If a LAI has to be deleted then all bits of the location area code shall be set to one with the exception of the least significant bit which shall be set to zero. If a SIM is inserted in a Mobile Equipment with the location area code containing all zeros, then the Mobile Equipment shall recognise this LAC as part of a deleted LAI

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 or the international mobile equipment identity together with the software version number, IMEISV.
The IMSI shall not exceed 15 digits, the TMSI/P-TMSI is 4 octets long, and the IMEI is composed of 15 hex digits ~~digitscharacters~~, the IMEISV is 16 hex digits ~~digits~~ ~~characters~~ (see TS 23.003).
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.

Table 10.5.4/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
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 or hexadecimal digits and also when the
           TMSI/P-TMSI is used
1          odd number of identity digits or hexadecimal digits

Identity digits (octet 3 etc)

For the IMSI, IMEI and IMEISV this field is coded using BCD  coding. For the IMSI
this field is coded using BCD coding. For the IMEI and IMEISV this field is coded
using hexadecimal coding. The exact coding of IMSI, IMEI and IMEISV is defined
in TS 23.003.

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".

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.
```

NOTE: This can be used in the case when a fill paging message without any valid identity has to be sent on the paging subchannel.

10.5.1.5   Mobile Station Classmark 1

The purpose of the *Mobile Station Classmark 1* information element is to provide the network with information concerning aspects of high priority of the mobile station equipment. This affects 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 *Mobile Station Classmark 1* information element is coded as shown in figure 10.5.5/TS 24.008 and table 10.5.5/TS 24.008.

The *Mobile Station Classmark 1* is a type 3 information element with 2 octets length.

8	7	6	5	4	3	2	1	
	Mobile Station Classmark 1 IEI							octet 1
0 spare	Revision level		ES IND	A5/1	RF power capability			octet 2

Figure 10.5.5/TS 24.008 *Mobile Station Classmark 1* information element

A MS supporting GSM shall always encode all fields relevant for GSM radio access technology, even when accessing UMTS radio access technology. A UMTS MS which does not support GSM shall encode fields relevant only for GSM radio access tecnology using any value which has been defined for this version of the protocol and is not reserved.

TDOC N1-000787

Title: **Handling of codec types in Ue for different access technologies.**

Source: **CN1**

TO: **SA4**

Cc:

WI: **Out of band transcoder control**

Contact Person:
Name: **Phil Hodges**
E-mail Address: phil.hodges@eed.ericsson.se
Tel. Number: +49 2407 575 6628

Date: **25.05.00**

_____

CN1 intend to introduce a Supported Codecs List IE in DTAP (call control) protocol for R'00 in order to support future codec types other than the default UMTS narrow band AMR, standardised for R'99.

It has been discussed in this working group whether or not the codec list should comprise of separate lists for each radio access. The perceived advantage of this approach is that it provides a freedom of implementation within the UE. Also negotiation of codecs in OoBTC procedures in the CN would only be performed using a list of codecs for the access type to which the UE is attached. However this could result in much signalling at set-up and much duplication if codecs are supported for more than one access type.

Thus CN1 kindly request SA4 to provide their opinion on this matter. If there is no practical reason for providing separate codec lists from the UE for each supported radio access technology then CN1 propose that the UE only provides one list with all codec types. It is then a matter of the MSC and the OoBTC procedures to limit the list to appropriate types for the radio access.

CHANGE REQUEST

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

24.008	CR	208r3	Current Version:	3.3.1

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

For submission to:	CN #8	for approval	X		Strategic		*(for SMG*
list expected approval meeting # here ↑		for information			non-strategic	X	*use only)*

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

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

Source:	Ericsson/Siemens		**Date:**	2000-05-18

Subject:	Change of the GMM Ready Timer behaviour

Work item:	GPRS

Category:
F Correction
A Corresponds to a correction in an earlier release
(only one category B Addition of feature
shall be marked C Functional modification of feature
with an X) D Editorial modification

	X

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

| **Reason for change:** | The MS/SGSN shall restart the GMM READY timer at transmission/reception of any LLC frame, including an LLC frame without an information field transmitted in order to perform cell update.

If the user is travelling around in an urban area, where the cell size is small, the READY timer will be restarted, even if there is no active user-data transmission. Thus, the MS and SGSN will remain in GMM ready state for considerably longer than is necessary, and the MS will continue to perform cell updates.

Frequent cell updates will lead to:
- increase of network load;
- waste of radio resources;
- significant increase of MS battery consumption, due to increased signalling and time spent in non-DRX mode.

In order to overcome this problem, it is proposed to introduce an optional cell update procedure where the READY timer will not be started if the LLC frame transmitted (by the MS)/received (by the SGSN) contains a cell update.

This proposed change is optional for both the network and the MS. |
|---|---|

Clauses affected:	4.7.1.2, 4.7.2.1.1, 4.7.3.1.1, 4.7.3.1.3, 4.7.5.1.1, 4.7.5.1.3, 9.4.1, 9.4.2, 9.4.14, 9.4.15, 9.4.23, 10.4, 10.5.5.21

Other specs affected:	Other 3G core specifications		→ List of CRs:	
	Other GSM core specifications	X	→ List of CRs:	
	MS test specifications		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other	The proposed solution introduces a "Cell Notification" (which is in fact an optimised Cell

comments: Update Procedure) into MS and SGSN. The possibility to use the Cell Notification will be indicated by the network and shall be used by the MS when the MS does support it. The update will be triggered by the LLC NULL frame (introduced in 04.64) which is only allowed to be send by the MS if the network indicates the Cell Notification.

The feature is mandatory for R99 but a R99 network must be able to handle pre R99 MS which do not support Cell Notification.

Indication of the Cell Notification

A new, optional information element (optional on syntax level but on semantic level mandatory for R99) is introduced into the ATTACH ACCEPT and ROUTING AREA UPDATE ACCEPT message to indicate the ability of the network to support the Cell Notification.

If both the MS and SGSN support the Cell Notification, and the ATTACH ACCEPT message or ROUTING AREA UPDATE ACCEPT message contains a new value of the READY timer, the MS shall send any LLC frame except the LLC NULL frame in order to start the READY timer (LLC NULL frame can not be sent because it does not trigger the start of the READY timer).

Behaviour at Cell Notification (new cell is entered)

A LLC NULL frame is introduced at the LLC layer. If both the MS and SGSN support the Cell Notification, an MS shall transmit the LLC NULL frame in order to indicate a cell change to the network. The MS shall not start the READY timer as a result of transmitting the LLC NULL frame. Similarly, the SGSN shall not start the READY timer as a result of receiving LLC NULL frame.

Further:

An MS shall not transmit LLC NULL frame as a response to paging for PS services. If the MS does not support the Cell Notification but the SGSN indicates the ability to support them then the behaviour at cell update remains as currently specified.

*** First Modification ***

2.2.2   Vocabulary

The following terms are used in this Technical Specification:

> :

> :

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

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

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

*** Next Modification ***

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 (GSM 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 TS 23.022 [14]). 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.

*** Next Modification ***

4.7.3   GPRS attach procedure

4.7.3.1   GPRS attach procedure for GPRS services

4.7.3.1.1   GPRS attach procedure initiation

4.7.3.1.2   GMM common procedure initiation

4.7.3.1.3   GPRS attach accepted by the network

If the GPRS attach request is accepted by the network, an ATTACH ACCEPT message is sent to the MS.

The P-TMSI reallocation may be part of the GPRS attach procedure. The P-TMSI that shall be allocated is then included in the ATTACH ACCEPT message together with the routing area identifier. The network shall, in this case, change to state GMM-COMMON-PROCEDURE-INITIATED and shall start timer T3350 as described in section 4.7.6. Furthermore, the network may assign a P-TMSI signature for the GMM context which is then also included in the ATTACH ACCEPT message. If the LAI or PLMN identity that has been transmitted in the ATTACH ACCEPT message is a member of any of the "forbidden" lists, any such entry shall be deleted. Additionally, the network shall include the radio priority level to be used by the MS for mobile originated SMS transfer in the ATTACH ACCEPT message.

In GSM, the Cell Notification information element shall be included in the ATTACH ACCEPT message by the network which indicates that the Cell Notification is supported by the network.

In UMTS, the network should prolong the RR connection if the mobile station has indicated a follow-on request pending in ATTACH REQUEST. The network may also prolong the RR connection without any indication from the mobile terminal.

The MS, receiving an ATTACH ACCEPT message, stores the received routing area identification, stops timer T3310, reset the GPRS attach attempt counter, reset the routing area updating attempt counter, enters state GMM-REGISTERED and sets the GPRS update status to GU1 UPDATED.

If the message contains a P-TMSI, the MS shall use this P-TMSI as the new temporary identity for GPRS services. In this case, an ATTACH COMPLETE message is returned to the network. The MS shall delete its old P-TMSI and shall store the new one. If no P-TMSI has been included by the network in the ATTACH ACCEPT message, the old P-TMSI, if any available, shall be kept.

If the message contains a P-TMSI signature, the MS shall use this P-TMSI signature as the new temporary signature for the GMM context. The MS shall delete its old P-TMSI signature, if any is available, and shall store the new one. If the message contains no P-TMSI signature, the old P-TMSI signature, if available, shall be deleted.

After that in UMTS, if the mobile station has indicated follow-on request pending and has a CM application request pending, it shall send an appropriate message (for example ACTIVATE PDP CONTEXT REQUEST) to the network.

In GSM, if the ATTACH ACCEPT message contains the Cell Notification information element, then the MS shall start to use the LLC NULL frame to perform cell updates. The network receiving an ATTACH COMPLETE message stops timer T3350, changes to GMM-REGISTERED state and considers the P-TMSI sent in the ATTACH ACCEPT message as valid.

*** Next Modification ***

4.7.5 Routing area updating procedure

4.7.5.1 Normal and periodic routing area updating procedure

4.7.5.1.1 Normal and periodic routing area updating procedure initiation

4.7.5.1.2 GMM Common procedure initiation

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

If the routing area updating request has been accepted by the network, a ROUTING AREA UPDATE ACCEPT message shall be sent to the MS. The network may assign a new P-TMSI and/or a new P-TMSI signature for the MS. If a new P-TMSI and/or P-TMSI signature have been assigned to the MS, it/they shall be included in the ROUTING AREA UPDATE ACCEPT message together with the routing area identification.

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

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

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

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

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

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

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

-   a P-TMSI; and/or

-   Receive N-PDU Numbers (see 04.65 [78] and TS 25.322).

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

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

After that in UMTS, if the mobile station has indicated follow-on request pending and has a CM application request pending, it shall send an appropriate message (for example ACTIVATE PDP CONTEXT REQUEST) to the network.

*** Next Modification ***

9.4   GPRS Mobility Management Messages

9.4.2   Attach accept

This message is sent by the network to the MS to indicate that the corresponding attach request has been accepted. See table 9.4.2/TS 24.008.

Message type: ATTACH ACCEPT

Significance: dual

Direction: network to MS

Table 9.4.2/TS 24.008: ATTACH ACCEPT message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip indicator	Skip indicator 10.3.1	M	V	1/2
	Attach accept message identity	Message type 10.4	M	V	1
	Attach result	Attach result 10.5.5.1	M	V	1/2
	Force to standby	Force to standby 10.5.5.7	M	V	1/2
	Periodic RA update timer	GPRS Timer 10.5.7.3	M	V	1
	Radio priority for SMS	Radio priority 10.5.7.2	M	V	1/2
	Spare half octet	Spare half octet 10.5.1.8	M	V	1/2
	Routing area identification	Routing area identification 10.5.5.15	M	V	6
19	P-TMSI signature	P-TMSI signature 10.5.5.8	O	TV	4
17	Negotiated READY timer value	GPRS Timer 10.5.7.3	O	TV	2
18	Allocated P-TMSI	Mobile identity 10.5.1.4	O	TLV	7
23	MS identity	Mobile identity 10.5.1.4	O	TLV	6 - 7
25	GMM cause	GMM cause 10.5.5.14	O	TV	2
2A	T3302 value	GPRS Timer 10.5.7.3	O	TLV	3
8C	Cell Notification	Cell Notification 10.5.5.21	O	T	1

9.4.2.1   P-TMSI signature

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

9.4.2.2   Negotiated READY timer

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

9.4.2.3   Allocated P-TMSI

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

9.4.2.4   MS identity

This IE may be included to assign or unassign a TMSI to an MS in case of a combined GPRS attach.

9.4.2.5   GMM cause

This IE shall be included when IMSI attach for non-GPRS services was not successful during a combined GPRS attach procedure.

9.4.2.6   T3302 value

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

9.4.2.7   Cell Notification (GSM only)

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

9.4.15   Routing area update accept

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

Message type: ROUTING AREA UPDATE ACCEPT

Significance: dual

Direction: network to MS

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

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip indicator	Skip indicator 10.3.1	M	V	1/2
	Routing area update accept message identity	Message type 10.4	M	V	1
	Force to standby	Force to standby 10.5.5.7	M	V	1/2
	Update result	Update result 10.5.5.17	M	V	1/2
	Periodic RA update timer	GPRS Timer 10.5.7.3	M	V	1
	Routing area identification	Routing area identification 10.5.5.15	M	V	6
19	P-TMSI signature	P-TMSI signature 10.5.5.8	O	TV	4
18	Allocated P-TMSI	Mobile identity 10.5.1.4	O	TLV	7
23	MS identity	Mobile identity 10.5.1.4	O	TLV	7
26	List of Receive N-PDU Numbers	Receive N-PDU Number list 10.5.5.11	O	TLV	4 - 19
17	Negotiated READY timer value	GPRS Timer 10.5.7.3	O	TV	2
25	GMM cause	GMM cause 10.5.5.14	O	TV	2
2A	T3302 value	GPRS Timer 10.5.7.3	O	TLV	3
8C	Cell Notification	Cell Notification 10.5.5.21	O	T	1

9.4.15.1   P-TMSI signature

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

9.4.15.2   Allocated P-TMSI

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

9.4.15.3   MS identity

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

9.4.15.4   List of Receive N-PDU Numbers

This IE shall be included in case of an inter SGSN routing area updating, if there are PDP contexts that have been activated in acknowledged transfer mode.

9.4.15.5   Negotiated READY timer value

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

9.4.15.6   GMM cause

This IE shall be included if IMSI attach was not successful for non-GPRS services during a combined GPRS routing area updating procedure.

9.4.15.7   T3302 value

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

9.4.15.8   Cell Notification (GSM only)

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

*** Next Modification ***

10.5.5.21   Cell Notification

The purpose of the Ceell Notification information element is to indicate that the Cell Notification is supported by the network and shall be then used by MS.

The Ceell Notification information element is coded as shown in figure 10.5.136/GSM 24.008.

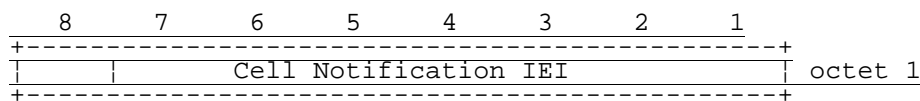The Ceell Notification is a type 2 information element.

```
      8      7      6      5      4      3      2      1
   +-----------------------------------------------+
   |      |      |     Cell Notification IEI       |  octet 1
   +-----------------------------------------------+
```

Figure 10.5.136/GSM 24.008: Cell Notification information element

No further changes.

CHANGE REQUEST

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

04.64 CR	**A142r2**	Current Version:	8.3.0

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

For submission to:	CN #8	for approval	X	Strategic		*(for SMG*
list expected approval meeting # here ↑		for information		non-strategic		*use only)*

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

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

Source:	Siemens / Ericsson	**Date:**	2000-05-18

Subject:	Change of the Cell update procedure

Work item:	GPRS

Category:

					Release:		
	F	Correction		X		Phase 2	
	A	Corresponds to a correction in an earlier release				Release 96	
(only one category	B	Addition of feature				Release 97	
shall be marked	C	Functional modification of feature				Release 98	
with an X)	D	Editorial modification				Release 99	X
						Release 00	

| Reason for change: | The MS/SGSN shall restart the GMM READY timer at transmission/reception of any LLC frame, including an LLC frame without an information field transmitted in order to perform cell update.

If the user is travelling around in an urban area, where the cell size is small, the READY timer will be restarted, even if there is no active user-data transmission. Thus, the MS and SGSN will remain in GMM ready state for considerably longer than is necessary, and the MS will continue to perform cell updates.

Frequent cell updates will lead to:
- increase of network load;
- waste of radio resources;
- significant increase of MS battery consumption, due to increased signalling and time spent in non-DRX mode.

In order to overcome this problem, it is proposed to introduce an optional cell update procedure where the READY timer will not be started if the LLC frame transmitted (by the MS)/received (by the SGSN) contains a cell update.

This proposed change is optional for both the network and the MS. |
|---|---|

Clauses affected:	6.4, 6.4.1.7 (new), 7.1.2, 7.2.1.3, 8.1

Other specs affected:	Other 3G core specifications		→ List of CRs:	
	Other GSM core specifications	X	→ List of CRs:	
	MS test specifications		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other comments:	The proposed solution introduces a "Cell Notification" (which is in fact an optimised Cell Update Procedure) into MS and SGSN. The possibility to use the Cell Notification will be

indicated by the network and shall be used by the MS when the MS does support it. The update will be triggered by the LLC NULL frame (introduced in 04.64) which is only allowed to be send by the MS if the network indicates the Cell Notification.

The feature is mandatory for R99 but a R99 network must be able to handle pre R99 MS which do not support Cell Notification.

Indication of the Cell Notification

A new, optional information element (optional on syntax level but on semantic level mandatory for R99) is introduced into the ATTACH ACCEPT and ROUTING AREA UPDATE ACCEPT message to indicate the ability of the network to support the Cell Notification.

If both the MS and SGSN support the Cell Notification, and the ATTACH ACCEPT message or ROUTING AREA UPDATE ACCEPT message contains a new value of the READY timer, the MS shall send any LLC frame except the LLC NULL frame in order to start the READY timer (LLC NULL frame can not be sent because it does not trigger the start of the READY timer).

Behaviour at Cell Notification (new cell is entered)

A LLC NULL frame is introduced at the LLC layer. If both the MS and SGSN support the Cell Notification, an MS shall transmit the LLC NULL frame in order to indicate a cell change to the network. The MS shall not start the READY timer as a result of transmitting the LLC NULL frame. Similarly, the SGSN shall not start the READY timer as a result of receiving LLC NULL frame.

Further:

An MS shall not transmit LLC NULL frame as a response to paging for PS services. If the MS does not support the Cell Notification but the SGSN indicates the ability to support them then the behaviour at cell update remains as currently specified.

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<--------- double-click here for help and instructions on how to create a CR.

6.4   Commands and responses

The following commands and responses are used by the MS and the SGSN LLEs and are represented in Table 4. Each logical link connection shall support the appropriate set of commands and responses for the type of operation desired (see clause 8).

Those frame types not identified in Figure 8, Fugure 9, or Table 4, shall be identified as having undefined command and/or response control fields, and shall be treated as defined in subclause 8.8.2.

Table 14: Commands and responses

Format	Commands	Responses	S1	S2	Encoding M4	M3	M2	M1
Information + Supervisory	RR	RR	0	0	-	-	-	-
	ACK	ACK	0	1	-	-	-	-
	RNR	RNR	1	0	-	-	-	-
	SACK	SACK	1	1	-	-	-	-
Unnumbered	-	DM	-	-	0	0	0	1
	DISC	-	-	-	0	1	0	0
	-	UA	-	-	0	1	1	0
	SABM	-	-	-	0	1	1	1
	-	FRMR	-	-	1	0	0	0
	XID	XID	-	-	1	0	1	1
	NULL	-	-	-	0	0	0	0

Note: The NULL frame is only allowed if the Cell Notification is used (24.008)

The commands and responses in Table 4 are defined in the following subclauses.

Next Section to Modify   (new Section)

6.4.1.7   NULL command

The NULL unnumbered command shall be used by an LLE of the MS to indicate a cell update. The NULL unnumbered command is only allowed if the Cell Notification is indicated by the network (see 23.060 and 24.008).

No information field is permitted with the NULL command.

Agenda Item: 4.1

Source: Ericsson / Siemens

Title: LS to S2 on optimisation of Cell Update Procedure

Document for: Approval

_____

The issue of staying of MM in state READY virtually forever is discussed in N1-000723 and a solution has been proposed which is backward compatible.

There are changes necessary in 24.007 (CR A014r2), 24.008 (CR 208r3), 04.64 (CR 142r2) R99.

This changes need to be regarded by 23.060 R99 to be valid. The proposed changes are attached as CRA147r3.

3GPP SA WG 2 Meeting #12
Berlin, Germany, 22-26 May 2000

Document **S2-000xxx**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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

23.060 CR	**A147r3**	Current Version:	**3.3.0**

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

For submission to:	CN #8	for approval	**X**	Strategic		*(for SMG*
list expected approval meeting # here ↑		for information		non-strategic		*use only)*

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

Proposed change affects:
(at least one should be marked with an X)

(U)SIM		ME	**X**	UTRAN / Radio		Core Network	**X**

Source:	Ericsson/Siemens		**Date:**	2000-05-18

Subject:	Change of the Cell update procedure

Work item:	GPRS

Category: F   Correction   **X**   **Release:**

			Release:	
	F	Correction	**X**	Phase 2	
	A	Corresponds to a correction in an earlier release		Release 96	
(only one category	B	Addition of feature		Release 97	
shall be marked	C	Functional modification of feature		Release 98	
with an X)	D	Editorial modification		Release 99	**X**
				Release 00	

Reason for change:	The MS/SGSN shall restart the GMM READY timer at transmission/reception of any LLC frame, including an LLC frame without an information field transmitted in order to perform cell update.
	If the user is travelling around in an urban area, where the cell size is small, the READY timer will be restarted, even if there is no active user-data transmission. Thus, the MS and SGSN will remain in GMM ready state for considerably longer than is necessary, and the MS will continue to perform cell updates.
	Frequent cell updates will lead to:
	- increase of network load;
	- waste of radio resources;
	- significant increase of MS battery consumption, due to increased signalling and time spent in non-DRX mode.
	In order to overcome this problem, it is proposed to introduce an optional cell update procedure where the READY timer will not be started if the LLC frame transmitted (by the MS)/received (by the SGSN) contains a cell update.
	This proposed change is optional for both the network and the MS.

Clauses affected:	6.9.1.1, 8.4

Other specs affected:	Other 3G core specifications		→ List of CRs:	
	Other GSM core specifications	**X**	→ List of CRs:	
	MS test specifications		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other	The proposed solution introduces a "Cell Notification" (which is in fact an optimised Cell

| **comments:** | Update Procedure) into MS and SGSN. The possibility to use the Cell Notification will be indicated by the network and shall be used by the MS when the MS does support it. The update will be triggered by the LLC NULL frame (introduced in 04.64) which is only allowed to be send by the MS if the network indicates the Cell Notification. |

The feature is mandatory for R99 but a R99 network must be able to handle pre R99 MS which do not support Cell Notification.

Indication of the Cell Notification

A new, optional information element (optional on syntax level but on semantic level mandatory for R99) is introduced into the ATTACH ACCEPT and ROUTING AREA UPDATE ACCEPT message to indicate the ability of the network to support the Cell Notification.

If both the MS and SGSN support the Cell Notification, and the ATTACH ACCEPT message or ROUTING AREA UPDATE ACCEPT message contains a new value of the READY timer, the MS shall send any LLC frame except the LLC NULL frame in order to start the READY timer (LLC NULL frame can not be sent because it does not trigger the start of the READY timer).

Behaviour at Cell Notification (new cell is entered)

A LLC NULL frame is introduced at the LLC layer. If both the MS and SGSN support the Cell Notification, an MS shall transmit the LLC NULL frame in order to indicate a cell change to the network. The MS shall not start the READY timer as a result of transmitting the LLC NULL frame. Similarly, the SGSN shall not start the READY timer as a result of receiving LLC NULL frame.

Further:

An MS shall not transmit LLC NULL frame as a response to paging for PS services. If the MS does not support the Cell Notification but the SGSN indicates the ability to support them then the behaviour at cell update remains as currently specified.

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6.9.1.1 Cell Update Procedure

A cell update takes place when the MS enters a new cell inside the current RA and the MS is in READY state. If the RA has changed, a routeing area update is executed instead of a cell update.

If the network does not support the Cell Notification (in fact an optimised Cell Update Procedure, see 24.008) Tthe MS performs the cell update procedure by sending an uplink LLC frame of any type except the LLC NULL frame (see 04.64), containing the MS's identity, to the SGSN. If the network and the MS support the Cell Notification then the MS shall use the LLC NULL frame, containing the MS's identity, in order to perform a cell update. The support of Cell Notification is mandatory for MS and network but the network as well as the MS has to support the Cell Update Procedure, not using the LLC NULL frame, for backward compatibility reasons.

In the direction towards the SGSN, the BSS shall add the Cell Global Identity including RAC and LAC to all BSSGP frames, see GSM 08.18. A cell update is any correctly received and valid LLC PDU carried inside a BSSGP PDU containing a new identifier of the cell.

The SGSN records this MS's change of cell, and further traffic directed towards the MS is conveyed over the new cell.

Next Section to Modify

8.4 Paging for GPRS Downlink Transfer

An MS in STANDBY state is paged by the SGSN before a downlink transfer to that MS. The paging procedure shall move the MM state to READY to allow the SGSN to forward downlink data to the radio resource. Therefore, any uplink data from the MS that moves the MM context at the SGSN to READY state is a valid response to paging.

The SGSN supervises the paging procedure with a timer. If the SGSN receives no response from the MS to the Paging Request message, it shall repeat the paging. The repetition strategy is implementation dependent.

The MS shall accept pages also in READY state if no radio resource is assigned. This supports recovery from inconsistent MM states in MS and SGSN.

The GPRS Paging procedure is illustrated in **Error! Reference source not found.**Figure 33. Each step is explained in the following list.
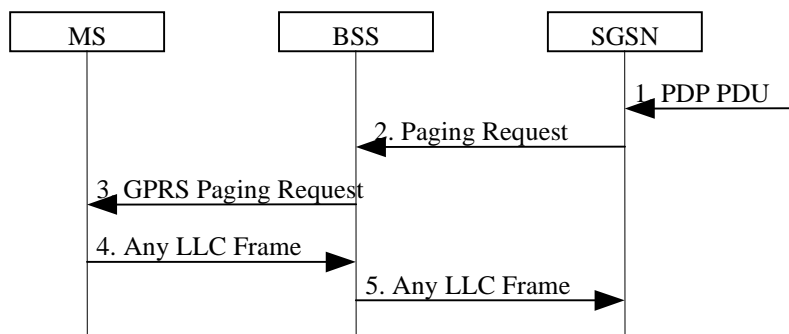

Figure 133: GPRS Paging Procedure

1) The SGSN receives a downlink PDP PDU for an MS in STANDBY state. Downlink signalling to a STANDBY state MS initiates paging as well.

2) The SGSN sends a BSSGP Paging Request (IMSI, P-TMSI, Area, Channel Needed, QoS, DRX Parameters) message to the BSS serving the MS. IMSI is needed by the BSS in order to calculate the MS paging group. P-TMSI is the identifier by which the MS is paged. Area indicates the routeing area in which the MS is paged. Channel Needed indicates GPRS paging. QoS is the negotiated QoS for the PDP context that initiates the paging procedure, and indicates the priority of this Paging Request relative to other Paging Request messages buffered in the BSS. DRX Parameters indicates whether the MS uses discontinuous reception or not. If the MS uses discontinuous reception, then DRX Parameters also indicate when the MS is in a non-sleep mode able to receive paging requests.

3) The BSS pages the MS with one Paging Request (P-TMSI, Channel Needed) message in each cell belonging to the addressed routeing area. This is described in GSM 03.64.

4) Upon receipt of a GPRS Paging Request message, the MS shall respond with either any single valid LLC frame (e.g., a Receive Ready or Information frame) that implicitly is interpreted as a page response message by the SGSN. The MS shall not use the LLC NULL frame as a page response. When responding, the MS changes MM state to READY. The response is preceded by the Packet Channel Request and Packet Immediate Assignment procedures as described in GSM 03.64.

5) Upon reception of the LLC frame, the BSS adds the Cell Global Identity including the RAC and LAC of the cell and sends the LLC frame to the SGSN. The SGSN shall then consider the LLC frame to be an implicit paging response message and stop the paging response timer.

No further changes.

Source: TSG CN1

To: TSG SA2

Title: LS to S2 on optimisation of Cell Update Procedure

Document for: Approval

_____

The issue of staying of MM in state READY virtually forever is discussed in N1-000723 and a solution has been proposed which is backward compatible.

There are changes necessary in 24.007 (CR A014r2), 24.008 (CR 208r3), 04.64 (CR 142r2) R99.

This changes need to be regarded by 23.060 R99 to be valid. The proposed changes are attached as CRA147r3.

CHANGE REQUEST

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page for instructions on how to fill in this form correctly.

23.060	CR	**A147r3**	Current Version:	3.3.0

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

For submission to:	CN #8	for approval	**X**		Strategic		*(for SMG*
list expected approval meeting # here ↑		for information			non-strategic		*use only)*

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

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

Source:	Ericsson/Siemens		**Date:**	2000-05-18

Subject:	Change of the Cell update procedure

Work item:	GPRS

Category: F   Correction   **X**   **Release:**   Phase 2   ☐

	A	Corresponds to a correction in an earlier release			Release 96	☐
(only one category	B	Addition of feature			Release 97	☐
shall be marked	C	Functional modification of feature			Release 98	☐
with an X)	D	Editorial modification			Release 99	**X**
					Release 00	☐

| Reason for change: | The MS/SGSN shall restart the GMM READY timer at transmission/reception of any LLC frame, including an LLC frame without an information field transmitted in order to perform cell update.

If the user is travelling around in an urban area, where the cell size is small, the READY timer will be restarted, even if there is no active user-data transmission. Thus, the MS and SGSN will remain in GMM ready state for considerably longer than is necessary, and the MS will continue to perform cell updates.

Frequent cell updates will lead to:
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- waste of radio resources;
- significant increase of MS battery consumption, due to increased signalling and time spent in non-DRX mode.

In order to overcome this problem, it is proposed to introduce an optional cell update procedure where the READY timer will not be started if the LLC frame transmitted (by the MS)/received (by the SGSN) contains a cell update.

This proposed change is optional for both the network and the MS. |
|---|---|

Clauses affected:	6.9.1.1, 8.4

Other specs affected:	Other 3G core specifications	☐	→ List of CRs:	
	Other GSM core specifications	**X**	→ List of CRs:	
	MS test specifications	☐	→ List of CRs:	
	BSS test specifications	☐	→ List of CRs:	
	O&M specifications	☐	→ List of CRs:	

Other	The proposed solution introduces a "Cell Notification" (which is in fact an optimised Cell

comments:	Update Procedure) into MS and SGSN. The possibility to use the Cell Notification will be indicated by the network and shall be used by the MS when the MS does support it. The update will be triggered by the LLC NULL frame (introduced in 04.64) which is only allowed to be send by the MS if the network indicates the Cell Notification.

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Further:

An MS shall not transmit LLC NULL frame as a response to paging for PS services. If the MS does not support the Cell Notification but the SGSN indicates the ability to support them then the behaviour at cell update remains as currently specified.

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In the direction towards the SGSN, the BSS shall add the Cell Global Identity including RAC and LAC to all BSSGP frames, see GSM 08.18. A cell update is any correctly received and valid LLC PDU carried inside a BSSGP PDU containing a new identifier of the cell.

The SGSN records this MS's change of cell, and further traffic directed towards the MS is conveyed over the new cell.

Next Section to Modify

8.4 Paging for GPRS Downlink Transfer

An MS in STANDBY state is paged by the SGSN before a downlink transfer to that MS. The paging procedure shall move the MM state to READY to allow the SGSN to forward downlink data to the radio resource. Therefore, any uplink data from the MS that moves the MM context at the SGSN to READY state is a valid response to paging.

The SGSN supervises the paging procedure with a timer. If the SGSN receives no response from the MS to the Paging Request message, it shall repeat the paging. The repetition strategy is implementation dependent.

The MS shall accept pages also in READY state if no radio resource is assigned. This supports recovery from inconsistent MM states in MS and SGSN.

The GPRS Paging procedure is illustrated in **Error! Reference source not found.**. Each step is explained in the following list.
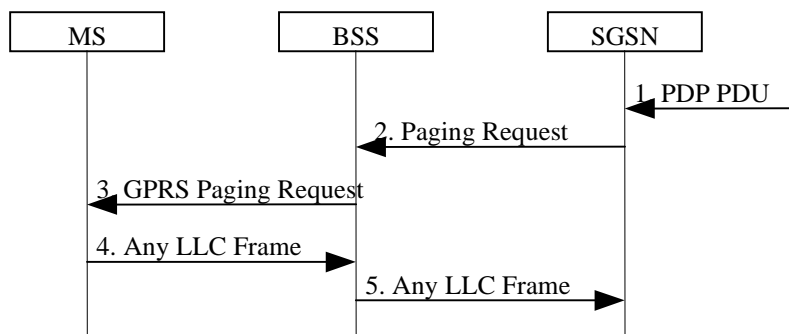

Figure 1: GPRS Paging Procedure

1) The SGSN receives a downlink PDP PDU for an MS in STANDBY state. Downlink signalling to a STANDBY state MS initiates paging as well.

2) The SGSN sends a BSSGP Paging Request (IMSI, P-TMSI, Area, Channel Needed, QoS, DRX Parameters) message to the BSS serving the MS. IMSI is needed by the BSS in order to calculate the MS paging group. P-TMSI is the identifier by which the MS is paged. Area indicates the routeing area in which the MS is paged. Channel Needed indicates GPRS paging. QoS is the negotiated QoS for the PDP context that initiates the paging procedure, and indicates the priority of this Paging Request relative to other Paging Request messages buffered in the BSS. DRX Parameters indicates whether the MS uses discontinuous reception or not. If the MS uses discontinuous reception, then DRX Parameters also indicate when the MS is in a non-sleep mode able to receive paging requests.

3) The BSS pages the MS with one Paging Request (P-TMSI, Channel Needed) message in each cell belonging to the addressed routeing area. This is described in GSM 03.64.

4) Upon receipt of a GPRS Paging Request message, the MS shall respond with either any single valid LLC frame (e.g., a Receive Ready or Information frame) that implicitly is interpreted as a page response message by the SGSN. The MS shall not use the LLC NULL frame as a page response. When responding, the MS changes MM state to READY. The response is preceded by the Packet Channel Request and Packet Immediate Assignment procedures as described in GSM 03.64.

5) Upon reception of the LLC frame, the BSS adds the Cell Global Identity including the RAC and LAC of the cell and sends the LLC frame to the SGSN. The SGSN shall then consider the LLC frame to be an implicit paging response message and stop the paging response timer.

No further changes.

Title:	**LS on Transport of Codec Information during the Codec Negotiation between MS and MSC**
Source:	**CN1**
TO:	**RAN2, RAN3**
WI:	**Out of band transcoder control**

Contact Person:
    Name: **Robert Zaus**
    E-mail Address: **robert.zaus@icn.siemens.de**
    Tel. Number: **+49 170 3315485**

Date: **25.05.00**

_____

Following the joint ad-hoc meeting between CN1, RAN2 and RAN3 on Thursday, 25.05.00, CN1 discussed again the requirements for the transport of Codec Information during the Codec Negotiation between MS and MSC, with the following outcome:

To be prepared for the negotiation of more than one codec type in R'00, CN1 kindly ask RAN2 and RAN3 to provide in 3GPP R'99 a mechanism for the transport of codec information in the protocols under their responsibility.

1) The information about the Selected Codec is sent by the MSC via the Iu interface in the RANAP messages RAB Assignment Request and Relocation Request. The information is included in these messages as one or several optional information elements, proposed name: "NAS Synchronization Indicator". The MSC shall include this information element, if the MS has to assign a codec or has to change the codec together with the radio bearer assignment, re-configuration or handover.

   The NAS Synchronization Indicator IE shall be a 4 bit field.
   For the case of a multicall with more than one speech bearer, it must be possible to include one NAS Synchronization Indicator IE for each of these speech bearers.
   (*Note:* The multicall feature allows a mobile subscriber to have several CS calls simultaneously.)

2) If the information element is contained in the RANAP message, it has to be included by the RNC in the corresponding RRC message, used e.g. for radio bearer setup or reconfiguration.

3) If more than one bearer has been allocated, it must be possible for the RRC entity on the UE side to deliver each NAS Synchronization Indicator IE to the upper layer together with the associated stream identifier.The specification of the relevant service primitives in TS 24.007 has not yet been updated by CN1, however, the primitives can be expected to have the following form:

at the RR-SAP - MS side:

PRIMITIVES	PARAMETERS
RR_SYNC_IND	cause (ciphering, resource assign, channel mode modify), list of (stream identifier, NAS Synchronization Indicator)

at the RR-SAP - Network side:

PRIMITIVES	PARAMETERS
RR_SYNC_REQ	cause (ciphering, resource assign, channel mode modify,), list of (stream identifier, NAS Synchronization Indicator)

The parameter "list of (stream identifier, NAS Synchronization Indicator)" will be included only, if the cause is equal to "resource assign." or "channel mode modify". In this case the list will contain the stream identifiers and associated NAS Synchronization Indicators of all bearers for which a codec has to be activated or changed during the RRC procedure.

4) It shall be possible to send the NAS Synchronization Indicator IE to the UE without really changing the SDU formats and therefore not re-initializing the radio access bearer and radio bearer.

CHANGE REQUEST

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23.122 CR	**003 rev 5**	Current Version:	3.2.0

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

For submission to:	CN#8	for approval	**X**	strategic		*(for SMG*
list expected approval meeting # here ↑		for information		non-strategic	**X**	*Use only)*

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

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

Source:	Ericsson		**Date:**	12-05-2000

Subject:	Modification of PLMN Selection Procedures to support UMTS+COMPACT Network Selection

Work item:	GSM / UMTS interworking

Category:

			Release:	
F	Correction	**X**	Phase 2	
A	Corresponds to a correction in an earlier release		Release 96	
B	Addition of feature		Release 97	
C	Functional modification of feature		Release 98	
D	Editorial modification		Release 99	**X**
			Release 00	

(only one category shall be marked with an X)

Reason for change:	Modifications are required to 23.122 to support the requirements in the latest 22.011

Clauses affected:	See below

Other specs Affected:

Other 3G core specifications	[ ]	→ List of CRs:	
Other GSM core specifications	[ ]	→ List of CRs:	
MS test specifications	[ ]	→ List of CRs:	
BSS test specifications	[ ]	→ List of CRs:	
O&M specifications	[ ]	→ List of CRs:	

Other comments:

Revision History:
(1) Tdoc N1-000303 was a merge between N1-000285 and N1-000301, with some editorial improvements
(2) Tdoc N1-000583 was an update of Tdoc N1-000303, incorporating comments received after presentation in N1.
(3) Tdoc N1-000630 is an updated of Tdoc N1-000538, incorporating additional comments from Siemens and some changes due to internal (Ericsson) review.
(3)(4) Tdoc N1-000719 updated after presentation of Tdoc N1-000630 and joint meeting N1-R2 on 23 May 2000 in Hawaii. Extension of the scan of HPLMN and RPLMN for all supported access technologies.
(5) Tdoc N1-000796 updated following editorial comments during presentation of Tdoc N1-000719

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<--------- double-click here for help and instructions on how to create a CR.

> *** **First modified section** ***

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1 Scope

~~Text to be added.~~

The present document gives an overview of the tasks relating to the NAS undertaken by a GSM or an UMTS Mobile Station (MS) in idle mode. In particular this is the stage 2 specification for PLMN Selection and Location Registration.

NOTE: The term "idle mode" is a long standing GSM term meaning the MS is switched on but not having a dedicated channel allocated, (e.g. not making or receiving a call).

The present document outlines how the requirements of the 22 series Technical Specifications (especially UMTS 22.011) on idle mode operation shall be implemented. Further details are given in UMTS 24.008.

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

1.2 Definitions and abbreviations

Abbreviations used in this TS are listed in GSM 01.04 and UMTS 21.905.

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

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

Available PLMN This is a PLMN where the MS has found a cell that satisfies conditions (ii) and (iv) of subclause 3.2.1 in GSM 03.22. For UMTS the criteria is specified in UMTS 25.304..

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

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

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

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

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

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

Suitable Cell This is a cell on which an MS may camp. It must satisfy criteria which is defined for GSM in GSM 03.22 and for UMTS in UMTS 25.304.

Acceptable Cell This is a cell that the MS may camp on to make emergency calls. It must satisfy criteria which is defined for GSM in GSM 03.22 and for UMTS in UMTS 25.304.

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

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

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

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

Access Technology The access technology associated with ~~HPLMN or~~ a PLMN ~~in the PLMN selector lists (see GSM 11.11)~~. The MS uses this information to determine what type of radio carrier to search for when attempting to select a specific PLMN (e.g., GSM, UMTS or GSM COMPACT). A PLMN may support more than one access technology.~~**Network Type** The network type associated with HPLMN or a PLMN on the PLMN selector (see GSM 11.11). The MS uses this information to determine what type of radio carrier to search for when attempting to select a specific PLMN. A PLMN may support more than one network type.~~

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

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

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

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

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

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

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

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

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

*** Next modified section ***

2 General description of idle mode

When an MS is switched on, it attempts to make contact with a ~~GSM~~ public land mobile network (PLMN)~~, using a certain access technology~~. The particular PLMN to be contacted may be selected either automatically or manually.

The MS looks for a suitable cell of the chosen PLMN and chooses that cell to provide available services, and tunes to its control channel. This choosing is known as "camping on the cell". The MS will then register its presence in the registration area of the chosen cell if necessary, by means of a location registration (LR), GPRS attach or IMSI attach procedure.

If the MS loses coverage of a cell, or find a more suitable cell, it reselects onto the most suitable ~~alternative~~ cell of the selected PLMN and camps on that cell. If the new cell is in a different registration area, an LR request is performed.

If the MS loses coverage of a PLMN, either a new PLMN is selected automatically, or an indication of which PLMNs are available is given to the user, so that a manual selection can be made.

Registration is not performed by MSs only capable of services ~~which~~ that need no registration. ~~for example GPRS services PTM-M or PTP anonymous access.~~

The purpose of camping on a cell in idle mode is ~~threefold~~fourfold:

a) It enables the MS to receive system information from the PLMN.

b) If the MS wishes to initiate a call, it can do this by initially accessing the network on the control channel of the cell on which it is camped (with the exceptions defined in GSM 03.22 subclauses 3.5.3 and 3.5.4 and UMTS 25.304).

c) ~~c)~~ If the PLMN receives a call for the MS, it knows (in most cases) the registration area of the cell in which the MS is camped. It can then send a "paging" message for the MS on control channels of all the cells in the registration area. The MS will then receive the paging message because it is tuned to the control channel of a cell in that registration area, and the MS can respond on that control channel.

d) It enables the MS to receive cell broadcast messages.

If the MS is unable to find a suitable cell to camp on, or the SIM is not inserted, or if it receives certain responses to an LR request (e.g., "illegal MS"), it attempts to camp on a cell irrespective of the PLMN identity, and enters a "limited service" state in which it can only attempt to make emergency calls.

In GSM, if the CTS MS is in CTS mode only or in automatic mode with CTS preferred, it will start by attempting to find a CTS fixed part on which it is enrolled

The idle mode tasks can be subdivided into 4 processes:

- PLMN selection;

- Cell selection and reselection;

- Location registration;

- CTS fixed part selection (GSM only).

In GSM, t~~To~~ make this initial CTS fixed part selection, the MS shall be enrolled on at least one fixed part.

The relationship between these processes is illustrated in figure 1 in clause 5. The states and state transitions within each process are shown in figures 2 to 4 in clause 5.

*** Next modified section ***

3.1 PLMN selection and roaming

The MS normally operates on its home PLMN (HPLMN). However a visited PLMN (VPLMN) may be selected, e.g., if the MS loses coverage. There are two modes for PLMN selection:

i) Automatic mode - This mode utilizes a list of PLMNs in priority order. The highest priority PLMN which is available and allowable is selected.

ii) Manual mode - Here the MS indicates to the user which PLMNs are available. Only when the user makes a manual selection does the MS try to obtain normal service on the VPLMN.

There are two cases:

- International Roaming - This is where the MS receives service on a PLMN of a different country than that of the HPLMN.

- National Roaming - This is where the MS receives service from a PLMN of the same country as that of the HPLMN, either anywhere or on a regional basis. The MS makes a periodic search for the HPLMN while national roaming.

To prevent repeated attempts to have roaming service on a not allowed LA, when the MS is informed that an LA is forbidden, the LA is added to a list of "forbidden LAs for roaming" which is stored in the MS. This list is deleted when the MS is switched off or when the SIM is removed. Such area restrictions are always valid for complete location areas independent of possible subdivision into GPRS routing areas. The structure of the routing area identifier (UMTS 23.003) supports area restriction on LA basis.

If a "PLMN not allowed" message is received by an MS in response to an LR request from a VPLMN, that VPLMN is added to a list of "forbidden PLMNs" in the SIM and thereafter that VPLMN will not be accessed by the MS when in automatic mode. A PLMN is removed from the "forbidden" list if, after a subsequent manual selection of that PLMN, there is a successful LR. This list is retained when the MS is switched off or the SIM is removed. The HPLMN shall not be stored on the list of "forbidden PLMNs".

In GSM, an~~A~~ ME not supporting SoLSA may consider a cell with the escape PLMN code (see UMTS 23.073) to be a part of a PLMN belonging to the list of "forbidden PLMNs".

Optionally the ME may store in its memory an extension of the forbidden PLMN list. The contents of the extension of the list shall be deleted when the MS is switched off or the SIM is removed.

***   Next modified section   ***

3.5   No suitable cell (limited service state)

There are a number of situations in which the MS is unable to obtain normal service from a PLMN. These include:

a) Failure to find a suitable cell of the selected PLMN;

b) No SIM in the MS;

c) A "PLMN not allowed" response to an LR;

d) An "illegal MS", "illegal ME" or "IMSI unknown in HLR" response to an LR; (Any SIM in the ME is then considered "invalid".)

e) A "GPRS not allowed" response to an LR of a GPRS MS attached to GPRS services only. (The cell selection state of GPRS MSs attached to GPRS and non-GPRS depends on the outcome of the location updating.)

(In automatic PLMN selection mode, events (a), (c) and (e) would normally cause a new PLMN selection, but even here, the situation may arise when no PLMNs are available and allowable for use).

Under any of these conditions, the MS attempts to camp on an acceptable cell, irrespective of its PLMN identity, so that emergency calls can be made if necessary. When in the limited service state with a valid SIM, the MS shall search for available and allowable PLMNs in the manner described in subclause 4.4.3.1 and when indicated in the SIM also as described in subclause 4.4.3.4. No LR requests are made until a valid SIM is present and either a suitable cell is found or a manual network reselection is performed. In the limited service state the presence of the MS need not be known to the PLMN on whose cell it has camped.

There are also other conditions under which only emergency calls may be made. These are shown in table 2 in clause 5.

***   Next modified section   ***

4.2 States description

Each of the processes of PLMN selection, cell selection and location registration can be described by a set of states. The overall state of the mobile is thus a composite of the states of the three processes. In some cases, an event which causes a change of state in one process may trigger a change of state in another process, e.g., camping on a cell in a new registration area triggers an LR request. The relationship between the processes is illustrated in figure 1 in clause 5.

The states in which the MS may be, for each of the processes, are described below and illustrated in figures 2 to 4 in clause 5. For many of the states, a fuller description can be found in other ~~GSM~~ Technical Specifications, and a reference to the ~~GSM~~ Technical Specification ~~and the relevant section within it, are~~is given after the state description.

In the event of any conflict between the diagrams and the text in this ETS, the text takes precedence.

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***  Next modified section  ***
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4.3.3 List of states for location registration (figure 4)

The states are entered depending on responses to location registration (LR) requests. Independent update states exist for GPRS and for non-GPRS operation in MSs capable of GPRS and non-GPRS services.

L1 Updated - The MS enters this state if an LR request is accepted. The update status is set to "updated". The GPRS and the non-GPRS update state of a MS may enter "updated" as a result of combined signalling or as a result of individual signalling depending on the capabilities of the network.

L2 Idle, No IMSI - The MS enters this state if an LR request is rejected with cause:

a) IMSI unknown in HLR;

b) illegal ME;

c) illegal MS;

d) GPRS services and non-GPRS services not allowed;

or if there is no SIM. All update states of a MS enter this state regardless whether received by individual or combined signalling for events b) and c). ~~Event a) results in "Roaming not allowed" for the non-GPRS update state only.~~ Event a) has no influence on the GPRS update state. Events b), c) and d) results in "Roaming not allowed" for the GPRS update state ~~only. Event d) has no influence on the non-GPRS update state.~~

If a SIM is present, the non-GPRS update status of the SIM is set to "Roaming not allowed". ~~for events a), b) and c).~~

L3 Roaming not allowed - The MS enters this state if it receives an LU reject message with the cause:

a) PLMN not allowed;

b) Location area not allowed;

c) Roaming not allowed in this location area.

All update states of the MS are set to "Roaming not allowed" regardless whether received by individual or combined signalling. The behaviour of the MS in the roaming not allowed state is dependent on the LR reject cause as shown in table 2 in clause 5. Additionally:

- in automatic mode, "PLMN not allowed" and "roaming not allowed in this location area" cause the Automatic Network Selection procedure of subclause 4.4.3.1.1A to be started; it is also caused by "GPRS not allowed" when received by a MS capable of GPRS only;

-        in manual mode, "PLMN not allowed" and "roaming not allowed" cause the Manual Network Selection procedure of subclause 4.4.3.1.2B to be started; it is also caused by "GPRS not allowed" when received by MS capable of GPRS only.

L4   Not updated - The MS enters this state if any LR failure not specified for states L2 or L3 occurs, in which cases the MS is not certain whether or not the network has received and accepted the LR attempt. The non-GPRS update status on the SIM and/or the GPRS update status are set to "not updated" depending on the specific location registration procedure and their outcome.

NOTE   This clause does not describe all the cases. For more details refer to ~~UM~~TS 24.008 [23]

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        ***  Next modified section  ***
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4.4   PLMN selection process

4.4.1   Introduction

There are two modes for PLMN selection, automatic and manual. These are described in subclauses 4.4.3 below and illustrated in figures 2a to 2b in clause 5.

4.4.2   Registration on a PLMN

The MS shall perform registration on the PLMN if the MS is capable of services which require registration. In both automatic and manual modes, the concept of registration on a PLMN is used. An MS successfully registers on a PLMN if:

a) The MS has found a suitable cell of the PLMN to camp on; and

b) An LR request from the MS has been accepted in the registration area of the cell on which the MS is camped (see table 1).

4.4.3   PLMN selection

The registration on the selected PLMN and the location registration are only necessary if the MS is capable of services which require registration. Otherwise, the PLMN selection procedures are performed without registration.

~~The access technologies for the HPLMN are stored on the SIM in priority order.~~

~~NOTE: To allow provision for multiple HPLMN codes, the HPLMN access technologies are stored on the SIM using the same format as the User Controlled PLMN Selector with Access Technology and Operator Controlled PLMN Selector with Access Technology data fields. It is assumed in this version of the specification that this HPLMN Selector with Access Technology data field should contain only one PLMN code, although this single code may be duplicated in the list if multiple access technologies with priority is defined.~~

The HPLMN Selector with Access Technology, User Controlled PLMN Selector with Access Technology and Operator Controlled PLMN Selector with Access Technology data fields in the SIM include associated access technologies for each PLMN entry, see GSM 11.11 [32]. The PLMN/access technology combinations are listed in priority order. If an ~~PLMN~~ entry includes more than one access technology, then no priority is defined for the preferred access technology and the priority is an implementation issue. ~~Alternatively, if priority is required, the same PLMN code may be duplicated in the list(s) but with different access technologies associated in each case. In this case the MS shall select the access technology according to the order in the PLMN Selector list.~~

NOTE: To allow provision for multiple HPLMN codes, the HPLMN access technologies are stored on the SIM using the same format as the User Controlled PLMN Selector with Access Technology and Operator Controlled PLMN Selector with Access Technology data fields. It is assumed in this version of the specification that this HPLMN Selector with Access Technology data field should contain only one PLMN code identical to the HPLMN code included in the IMSI. Although this single code may be duplicated in the list if multiple access technologies with priority is defined.

NOTE: Different GSM frequency bands (eg. 900, 1800, 1900, 400) are all considered GSM access technology. An MS supporting more than one band should scan all the bands it's supports when scanning for GSM frequencies. However GSM COMPACT systems which use GSM frequency bands but with the CBPCCH broadcast channel are considered as a separate access technology from GSM.

NOTE: ~~Duplicate PLMNs and associated access technology entries in selector lists may be ignored and the highest priority entries may be handled only.~~

4.4.3.1 At switch-on or recovery from lack of coverage

At switch on, the MS selects the registered PLMN (if it is available) using all access technologies that the MS is capable of and attempts to perform a Location Registration. ~~on the registered PLMN, if it exists, using the access technology type determined from the RPLMN last used access technology stored on the SIM. (If the RPLMN last used access technology does not exist in the SIM then an MS capable of more than one access technology shall use GSM access technology.)~~ The MS shall start its search using the access technology type stored in the RPLMN Last Used Access Technology data field on the SIM. If the RPLMN Last Used Access Technology is not available then an MS capable of GSM access technology shall start its search using GSM access technology.

On recovery from lack of coverage, the MS selects the registered PLMN (if it ~~exists~~ is available) using all access technologies that the MS is capable of and, if necessary (see subclause 4.5.2) attempts to perform a Location Registration~~, using all access technology types that the MS is capable of~~.

EXCEPTION: In GSM or GSM COMPACT, an MS with voice capability, or an MS not supporting packet services shall not search for CPBCCH carriers, unless the RPLMN Last Used Access Technology field is available in the SIM and indicates GSM COMPACT.

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

If there is no registered PLMN, or if registration is not possible due to the PLMN being unavailable or registration failure, the MS follows one of the following two procedures depending on its operating mode.

EXCEPTION: If registration is not possible on recovery from lack of coverage due to the registered PLMN being unavailable, a MS attached to GPRS services may, optionally, continue looking for the registered PLMN for an implementation dependent time.

NOTE: A MS attached to GPRS services should use the above exception only if one or more PDP contexts are currently active.

~~A)~~4.4.3.1.1 Automatic Network Selection Mode Procedure

The MS selects and attempts registration on other PLMNs, if available and allowable, ~~in all of its bands of operation~~using all supported access technologies that the MS is capable of, in the following order:

i) HPLMN (if not previously selected);

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

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

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

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

iii) other PLMNs with received high quality signal in random order;

iv) all other PLMNs in order of decreasing signal quality.

When following the above procedure the following requirements apply:

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

b) In GSM or GSM COMPACT, a~~An~~ MS with ~~GSM~~ voice capability, or an MS not supporting packet services shall not search for CPBCCH carriers.

c) In ~~step i,~~ ii and iii, the MS should limit its search ~~of~~ for the PLMN to the ~~network type~~access technology or access technologie~~s~~s ~~to the one~~associated with the PLMN ~~which it is attempting to select and register to~~ in the appropriate PLMN Selector with Access Technology list (~~HPLMN or any~~User Controlled ~~PLMN on the PLMN~~ or Operator Controlled selector ~~list~~). An MS using a SIM without access technology information storage (i.e. ~~the~~ ~~HPLMN Selector with Access Technology,~~User Controlled PLMN Selector with Access Technology and the Operator Controlled PLMN Selecti~~on~~or with Access Technology data fields are not present) shall instead use the PLMN Selector data field and assume GSM access technology as the highest priority radio access technology for all PLMNs. ~~If a PLMN entry on the PLMN selector specifies more than one network type, the MS may scan for network types in the order of the time it takes to identify them (with the exception of requirement b), starting with the network type that takes the shortest time to identify.~~

d) In ~~step iii~~iv and ~~iv~~, the MS shall search for all ~~network type~~access technologies it is capable of~~, with the exception of requirement b)~~, before deciding which PLMN to select.

~~e) A MS~~. ~~that does not have any stored network type information on the SIM shall first go through the steps by only searching for the BCCH network type. If no successful registration is achieved, then the COMPACT capable MS without GSM voice shall redo the procedure assuming that all PLMNs may be supporting all network types.~~

e) In i, ii, and iii, a packet only MS which supports GSM COMPACT, but using a SIM without access technology information storage (i.e. the HPLMN Selector with Access Technology, User Controlled PLMN Selector with Access Technology and the Operator Controlled PLMN Selecti~~on~~or with Access Technology data fields are not present) shall instead use the PLMN Selector data field and assume GSM COMPACT access technology as the lowest priority radio access technology for all PLMNs.

f) In i, the MS shall search for all access technologies it is capable of. The MS shall start its search using the access technologies stored in the HPLMN Selector with Access Technology data field on the SIM in priority order.

NOTE 2: ~~Requirements a) and b) do not apply to MSs supporting GSM circuit-switched data without supporting GSM voice.~~

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

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

NOTE ~~3~~: High quality signal is defined in the appropriate AS specification.

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

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

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

B)4.4.3.1.2 Manual Network Selection Mode Procedure

The MS indicates whether there are any PLMNs, ~~in all of its bands of operation,~~ which are available using all supported access technologies. This includes "Forbidden PLMNs" and PLMNs which only offer services not supported by the MS. An MS which supports GSM COMPACT shall also indicate GSM COMPACT PLMNs (which use PBCCH). ~~Any PLMN shall only be presented once.~~.

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

   i)   HPLMN;

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

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

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

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

   ~~iii) other PLMNs with received high quality signal in random order;~~

   ~~iv) all other PLMNs in order of decreasing signal quality.~~

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

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

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

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

   ~~NOTE 4:   The scan in manual network selection mode includes PLMNs having cells with CELL_BAR_QUALIFY_2 transmitted and cells with CPBCCHs.~~

   NOTE ~~5~~: High quality signal is defined in the appropriate AS specification.

4.4.3.2 User reselection

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

A)4.4.3.2.1 Automatic Network Selection Mode

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

   i)   HPLMN;

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

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

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

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

vi) The previously selected PLMN.

~~iii) Other PLMNs with the received high quality signal in random order excluding the previously selected PLMN;~~

~~iv) Any other PLMNs, excluding the previously selected PLMN in order of decreasing signal quality or, alternatively, the previously selected PLMN may be chosen ignoring its signal quality;~~

~~v)The previously selected PLMN.~~

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

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

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

a) ~~An MS with GSM voice capability shall ignore PLMNs for which the MS has identified at least one cell that transmits CELL_BAR_QUALIFY_2.~~

b) ~~An MS with GSM voice capability shall not search for CPBCCH carriers.~~

c) ~~In step i and ii, the MS should limit its search of network types to the one associated with the PLMN which it is attempting to select and register to (HPLMN or any PLMN on the PLMN selector). If a PLMN entry on the PLMN selector specifies more than one network type, the MS may scan for network types in the order of the time it takes to identify them (with the exception of requirement b), starting with the network type that takes the shortest time to identify.~~

d) In ~~step i~~v~~ii~~, iv, and v~~i~~, the MS shall search for all ~~network typ~~access technolog~~y~~ies it is capable of,~~ with the exception of requirement b),~~ before deciding which PLMN to select.

e) ~~A MS that does not have any stored network type information on the SIM shall first go through the steps by only searching for the BCCH network type. If no successful registration is achieved, then the COMPACT capable MS without GSM voice shall redo the procedure assuming that all PLMNs may be supporting all network types.~~

NOTE 6: ~~Requirements a) and b) do not apply to MSs supporting GSM circuit switched data without supporting GSM voice.~~The previously selected PLMN is the PLMN which the MS has selected prior to the start of the user reselection procedure

NOTE ~~7~~: High quality signal is defined in the appropriate AS specification.

4.4.3.2.2~~B)~~ Manual Network Selection Mode

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

4.4.3.3 In VPLMN of home country

The MS shall periodically attempt to obtain service on its HPLMN by scanning in accordance with the requirements that are applicable to ~~step~~ i) as defined in the Automatic Network Selection Mode in clause 4.4.3.1.1. For this purpose, a value T minutes may be stored in the SIM, T is either in the range 6 minutes to 8 hours in 6 minute steps or it indicates that no periodic attempts shall be made. If no value is stored in the SIM, a default value of 30 minutes is used.

The attempts to access the HPLMN shall be as specified below:

    a) The periodic attempts shall only be performed in automatic mode when the MS is roaming in its home country;

    b) After switch on, a period of at least 2 minutes and at most T minutes shall elapse before the first attempt is made;

    c) The MS shall make an attempt if the MS is on the VPLMN at time T after the last attempt;

    d) Periodic attempts shall only be performed by the MS while in idle mode;

    e) If the HPLMN is not found, the MS shall remain on the VPLMN.

4.4.3.4 Investigation Scan for higher prioritized PLMN

The support of this procedure is mandatory if the ME supports GSM COMPACT and otherwise optional.

A MS capable of both GSM voice and packet service shall, when indicated in the SIM, investigate if there is service from a higher prioritized PLMN not offering GSM voice service, either HPLMN or a PLMN in ~~the~~ a "PLMN Selector with Access Technology" data field ~~o~~in the SIM.

The MS shall scan ~~shall~~ for PLMNs ~~be performed~~ in accordance with the requirements described for automatic network selection mode in subclause 4.4.3.1.1 that are applicable to ~~step~~ i), ii) and ~~step~~ iii) with the exception of requirement a) and b) in subclause 4.4.3.1. Requirement a) and b) that are specified for automatic network selection mode in subclause 4.4.3.1 shall be ignored during the investigation scan.

If indicated on the SIM, the investigation scan shall be performed:

i)   After each successful PLMN selection and registration is completed, when the MS is in idle mode. This investigation scan may rely on the information from the already performed PLMN selection and may not necessarily require a rescan

ii)   When the MS is unable to obtain normal service from a PLMN, (limited service state) see subclause 3.5.

The investigation scan is restricted to automatic selection mode and shall only be performed by an MS that is capable of both voice and packet data. It shall only be performed if the selected PLMN is not already the highest prioritized PLMN in the current country. (HPLMN in home country, otherwise according to PLMN selector lists)

The MS shall return to RPLMN after the investigation scan is performed.

If a higher prioritized PLMN not offering GSM voice service is found, this shall be indicated to the user. The MS shall not select the PLMN unless requested by the user.

~~The investigation scan for higher prioritized PLMN shall be as specified below:~~

    ~~a) The scan shall only be performed in automatic network selection mode;~~

    ~~b) The scan shall only be performed by an MS that is capable of both voice and packet;~~

    ~~c) The scan shall only be performed if the serving PLMN is not the highest prioritized PLMN in the current country (HPLMN in home country, otherwise according to the PLMN selector list);~~

    ~~d) The scan shall be performed at least once after a successful PLMN selection is completed;~~

    ~~e) The investigation scan should be performed when the MS enters idle mode;~~

The MS shall return to RPLMN after the investigation scan is performed.

Note: The MS remains on the RPLMN independent of the outcome of the investigation scan. The purpose of the investigation scan is to check if there is a higher prioritized PLMN, not to select it.

4.4.4   Abnormal cases

If there is no SIM in the MS, if there is an authentication failure, or if the MS receives an "IMSI unknown in HLR", "illegal ME" or "illegal MS" response to an LR request, then effectively there is no selected PLMN ("No SIM" state). In these cases, the states of the cell selection process are such that no PLMN selection information is used. No further attempts at registration on any PLMN are made until the MS is switched off and on again, or a SIM is inserted.

When in Automatic Network Selection mode and the MS is in the "not updated" state with one or more suitable cells to camp on; then after the maximum allowed unsuccessful LR requests (controlled by the specific attempt counters) the MS may continue (or start if it is not running) the user reselection procedure of 4.4.3.2.1 A.

4.4.5   Roaming not allowed in this LA

If in either PLMN selection mode the LR response "Roaming not allowed in this LA" is received:

The PLMN Automatic or Manual Mode Selection Procedure of subclause 4.4.3.1 are followed, depending on whether the MS is in automatic or manual mode. (This requirement applies to all MSs.)

***   Next modified section   ***

4.5.2   Initiation of Location Registration

An LR request indicating Normal Updating is made when, in idle mode,

- the MS changes cell while being in the update state NOT UPDATED; (for MS capable of GPRS and non-GPRS services when at least one of both update states is NOT UPDATED)

- the MS detects that it has entered a new registration area, i.e., when the received registration area identity differs from the one stored in the MS, and the LAI or the PLMN identity is not contained in a list of forbidden LAIs or PLMN identities respectively, while being in one of the following update states:

    - UPDATED;

    - NOT UPDATED;

    - ROAMING NOT ALLOWED.

- the Periodic Location Updating Timer expires while being in the non-GPRS update state NOT UPDATED (triggers Location Updating);

- the Periodic Routing Area Update timer expires while being in the GPRS update state NOT UPDATED (triggers Routing Area Update);

- a manual network reselection has been performed, an acceptable cell of the selected PLMN is present, and the MS is not in the UPDATED state on the selected PLMN.

An LR request indicating Periodic Location Updating is made when, in idle mode, the Periodic Location Updating timer expires while being in the non-GPRS update state UPDATED.

An LR request indicating Periodic Routing Area Update is made when the Periodic Routing Area Update timer expires while being in the GPRS update state UPDATED.

An LR request indicating IMSI attach is made when the MS is activated in the same location area in which it was deactivated while being in the non-GPRS update state UPDATED, and the system information indicates that IMSI attach/detach shall be used.

A GPRS attach is made by a GPRS MS when activated and capable of services which require registration. Depending on system information about GPRS network operation mode MSs capable of GPRS and non-GPRS services perform combined or non-combined location registration procedures. When the combined routing area update or GPRS attach is accepted with indication "MSC not reachable" or is not answered the MS performs also the corresponding location updating procedure or falls back to a GPRS only MS. When the combined routing area update or GPRS attach is rejected with cause "GPRS not allowed" the GPRS update state is "IDLE, NO IMSI" and the MS performs the corresponding location updating procedure or falls back to a GPRS only MS.

Furthermore, an LR request indicating Normal Location Updating is also made when the response to an outgoing request shows that the MS is unknown in the VLR or SGSN, respectively.

Table 2 in clause 5 summarizes the events in each state that trigger a new LR request. The actions that may be taken while being in the various states are also outlined in table 2.

A GPRS MS which is both IMSI attached for GPRS and non-GPRS services and which is capable of simultaneous operation of GPRS and non-GPRS services shall perform Routing Area Update in connected mode when it has entered a new routing area which is not part of a LA contained in the list of forbidden LAIs.

*** Next modified section ***

4.6 Service indication (GSM only)

This is an indication to the user that service or CTS service is available.

The service indication should be set if the following conditions are all satisfied:

a) Cell Selection: Camped on a suitable cell and in updated state, or in connected mode having been camped on a suitable cell.

b) Location registration: In updated state, for MSs capable of services requiring registration.

A specific CTS service indication should be set when the CTS MS is attached to a CTS FP.

However due to the fact that there may be some transitory changes of state, the service indication is permitted to continue to be set for up to 10 seconds after the above conditions cease to be met. Also the service indication is permitted to take up to 1 second to be set after the above conditions are met.

4.7 Pageability of the mobile subscriber

An MS is required to listen to all paging messages that could address it (see GSM 05.02), when the following conditions are all satisfied:

- A SIM is inserted.

- The MS is camped on a cell.

- The MS is not in state "Idle, No IMSI".

- The MS is not performing the task to search for available PLMNs. (Whenever possible during this task, the MS should listen for paging.). However, when the MS is camped on a cell, is registered in a PLMN and is performing its regular search for the HPLMN, as specified in UMTS 22.011, then it shall listen to all paging messages that could address it.

NOTE 1: In GSM, during cell reselection there is a certain period when the MS is no longer camped on the old cell but must decode the full BCCH or CPBCCH before camping on the new cell. This leads to a period of slightly more than 8 51 frame multiframes when the MS will not necessarily be pageable.

5 Tables and Figures

Table 1: Effect of LR Outcomes on PLMN Registration

Location Registration Task State	Registration Status	Registered PLMN is
Updated	Successful	Indicated in the stored registration area identity
Idle, No IMSI	Unsuccessful	No registered PLMN (3)
Roaming not allowed:		
a) PLMN not allowed	Unsuccessful	No registered PLMN
b) LA not allowed	Indeterminate(1)	No registered PLMN
c) Roaming not allowed in this LA	Indeterminate (2)	No registered PLMN
Not updated	Unsuccessful	No registered PLMN

1)   The MS will eventually either enter a different state when the registration status will be determined, or fail to be able to camp on a cell, when registration will be unsuccessful.

2)   The MS will select the HPLMN if in automatic mode and will enter Automatic Network Selection Mode Procedure of subclause 4.4.3.1. If in manual mode, the MS will display the list of available PLMNs and follow the Manual Network Selection Mode Procedure of subclause 4.4.3.1.2 If the appropriate process does not result in registration, the MS will eventually enter the limited service state.

3)   A MS may have different update states for GPRS and non-GPRS. A PLMN is registered when at least one of both update states is updated.

NOTE 1: MSs capable of GPRS and non-GPRS services may have different registration status for GPRS and for non-GPRS.

NOTE 2: The registered PLMN is determined by looking at the stored registration area identity and stored location registration status.

3GPP TSG-CN-WG1, Meeting #12
22-26 May, 2000
Oahu/Hawaii, USA

Tdoc N1-000797

Title: LS on UE triggered authentication and key agreement during connections

Source: **3GPP TSG CN WG1**

TO: **3GPP TSG SA WG3**

Cc: **3GPP TSG RAN WG2, TSG T WG3**

WI: **Security**

Contact Person:
    Name: Duncan Mills
    E-mail Address: duncan.mills@vf.vodafone.co.uk
    Tel. Number: +44 1635 676074

Date: **25th May 2000**

_____

CN1 thanks SA3 for their Liaison statement (Tdoc S3-000213) on the above subject. CN1 recognises the need for such a function for R00 and will begin to study the issue.

The scope of such work must be defined and the WG from which the WI description originates must also be defined. CN1 proposes that such definitions are input to the R00 planning workshop in Nice on the 14.-15. June 2000 with the goal of approving the project plan at the TSG plenary #8 in June.

The Inter Group Coordinator for security is Chris Pudney of Vodafone AirTouch.

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

	04.08 CR	**A1031 r1**	Current Version:	7.7.0

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

For submission to: **TSG CN#8**   For approval **X**   Strategic **X** *(for SMG use only)*
list expected approval meeting # here ↑   for information ☐   non-strategic ☐

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

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

Source:	Ericsson		**Date:**	2000-05-26

Subject:	Support of GEA/2 Encryption Algorithm

Work item:	Security

Category: F Correction   **Release:** Phase 2 ☐
                       A Corresponds to a correction in an earlier release   Release 96 ☐
(only one category   B Addition of feature   **X**   Release 97 ☐
shall be marked   C Functional modification of feature   Release 98 **X**
with an X)   D Editorial modification   Release 99 ☐
                                                                                                         Release 00 ☐

Reason for change:

The GEA II ciphering algorithm has in SMG been approved to be optional in R'98 starting after the 31st of December 2002.

The possibility to negotiate capabilities for 7 encryption algorithms has been added to R98 (e.g. the MS network capability IE has been extended in order to handle this).

Furthermore the MS Network Capability IE has been added to the Routing Area Update procedure.

Clauses affected:	9.4.1, 9.4.14, 10.5.5.3, 10.5.5.12

Other specs affected:

Other 3G core specifications	☐	→ List of CRs:	
Other GSM core specifications	☐	→ List of CRs:	
MS test specifications	☐	→ List of CRs:	
BSS test specifications	☐	→ List of CRs:	
O&M specifications	☐	→ List of CRs:	

Other comments:

9.4   GPRS Mobility Management Messages

9.4.1   Attach request

This message is sent by the MS to the network in order to perform a GPRS or combined GPRS attach. See table 9.4.1/GSM 04.08.

Message type: ATTACH REQUEST

Significance: dual

Direction: MS to network

Table 9.4.1/GSM 04.08: ATTACH REQUEST message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip indicator	Skip indicator 10.3.1	M	V	½
	Attach request message identity	Message type 10.4	M	V	1
	MS network capability	MS network capability 10.5.5.12	M	LV	2-3
	Attach type	Attach type 10.5.5.2	M	V	½
	GPRS ciphering key sequence number	Ciphering key sequence number 10.5.1.2	M	V	½
	DRX parameter	DRX parameter 10.5.5.6	M	V	2
	P-TMSI or IMSI	Mobile identity 10.5.1.4	M	LV	6 - 9
	Old routing area identification	Routing area identification 10.5.5.15	M	V	6
	MS Radio Access capability	MS Radio Access capability 10.5.5.12a	M	LV	6 - 13
19	Old P-TMSI signature	P-TMSI signature 10.5.5.8	O	TV	4
17	Requested READY timer value	GPRS Timer 10.5.7.3	O	TV	2
9-	TMSI status	TMSI status 10.5.5.4	O	TV	1

9.4.1.1   Old P-TMSI signature

This IE is included if a valid P-TMSI and P-TMSI signature are stored in the MS.

9.4.1.2   Requested READY timer value

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

9.4.1.3   TMSI status

This IE shall be included if the MS performs a combined GPRS attach and no valid TMSI is available.

*** Next Modification ***

9.4.14   Routing area update request

This message is sent by the MS to the network either to request an update of its location file or to request an IMSI attach for non-GPRS services. See table 9.4.14/GSM 04.08.

Message type: ROUTING AREA UPDATE REQUEST

Significance: dual

Direction: MS to network

Table 9.4.14/GSM 04.08: ROUTING AREA UPDATE REQUEST message content

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator 10.2	M	V	1/2
	Skip indicator	Skip indicator 10.3.1	M	V	1/2
	Routing area update request message identity	Message type 10.4	M	V	1
	Update type	Update type 10.5.5.18	M	V	1/2
	GPRS ciphering key sequence number	Ciphering key sequence number 10.5.1.2	M	V	1/2
	Old routing area identification	Routing area identification 10.5.5.15	M	V	6
	MS Radio Access capability	MS Radio Access capability 10.5.5.12a	M	LV	6 - 13
19	Old P-TMSI signature	P-TMSI signature 10.5.5.8	O	TV	4
17	Requested READY timer value	GPRS Timer 10.5.7.3	O	TV	2
27	DRX parameter	DRX parameter 10.5.5.6	O	TV	3
9-	TMSI status	TMSI status 10.5.5.4	O	TV	1
31	MS network capability	MS network capability 10.5.5.12	O	TLV	3-4

9.4.14.1   Old P-TMSI signature

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

9.4.14.2   Requested READY timer value

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

9.4.14.3   DRX parameter

This IE may be included if the MS wants to indicate new DRX parameters.

9.4.14.4   TMSI status

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

9.4.14.x   MS network capability

This IE shall be included by the MS to indicate it's capabilities to the network, if the MS supports at least one of the GPRS Encryption Algorithm GEA/2 to GEA/7.

*** Next Modification ***

10.5.5.3   Ciphering algorithm

The purpose of the *ciphering algorithm* information element is to specify which ciphering algorithm shall be used.

The *ciphering algorithm* is a type 1 information element.

The *ciphering algorithm* information element is coded as shown in figure 10.5.119/GSM 04.08 and table 10.5.136/GSM 04.08.
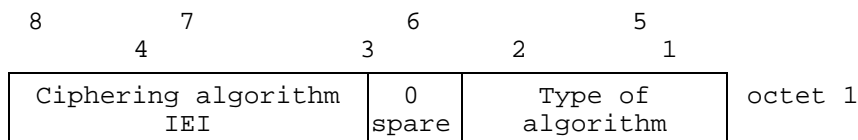
```
8        7           6       5
    4           3       2       1
  ┌─────────────────────┬───────┬───────────────┐
  │ Ciphering algorithm │   0   │    Type of    │  octet 1
  │        IEI          │ spare │   algorithm   │
  └─────────────────────┴───────┴───────────────┘
```

Figure 10.5.119/GSM 04.08: *Ciphering algorithm* information element

Table 10.5.136/GSM 04.08: *Ciphering algorithm* information element

```
  ┌────────────────────────────────────────────────┐
  │  Type of ciphering algorithm   (octet 1)       │
  │  Bits                                          │
  │  3 2 1                                         │
  │  0 0 0  ciphering not used                     │
  │  0 0 1  GPRS Encryption Algorithm GEA/1        │
  │  0 1 0  GPRS Encryption Algorithm GEA/2        │
  │  0 1 1  GPRS Encryption Algorithm GEA/3        │
  │  1 0 0  GPRS Encryption Algorithm GEA/4        │
  │  1 0 1  GPRS Encryption Algorithm GEA/5        │
  │  1 1 0  GPRS Encryption Algorithm GEA/6        │
  │  1 1 1  GPRS Encryption Algorithm GEA/7        │
  │                                                │
  │                                                │
  │  All other values are interpreted reserved     │
  │  by this version of the protocol.              │
  └────────────────────────────────────────────────┘
```

*** Next Modification ***

10.5.5.12   MS network capability

The purpose of the *MS network capability* information element is to provide the network with information concerning aspects of the mobile station related to GPRS. The contents might affect the manner in which the network handles the operation of the mobile station. The *MS network capability* 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 network capability* is a type 4 information element with a minimum of 3 and maximum of 34 octets length.

Octet 4 shall be included by the MS, if it supports at least one of the GPRS Encryption Algorithm GEA/2 to GEA/7. Support of octet 4 is optional in the network.

The value part of a *MS network capability* information element is coded as shown in figure 10.5.128/GSM 04.08 and table 10.5.145/GSM 04.08.
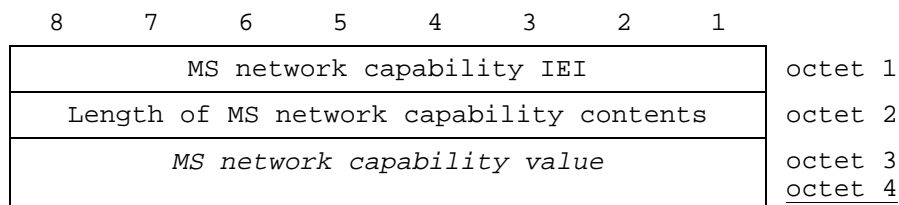
```
  8    7    6    5    4    3    2    1
┌────────────────────────────────────────┐
│      MS network capability IEI         │  octet 1
├────────────────────────────────────────┤
│  Length of MS network capability contents │  octet 2
├────────────────────────────────────────┤
│      MS network capability value       │  octet 3
│                                        │  octet 4
└────────────────────────────────────────┘
```

Figure 10.5.128/GSM 04.08: MS network capability information element

Table 10.5.145/GSM 04.08: *MS network capability* information element

\<MS network capability value part\> ::=

    \<**GEA1 bits**\>
    \<**SM capabilities via dedicated channels**: bit\>
    \<**SM capabilities via GPRS channels**: bit\>
        \<**UCS2 support**: bit\>
    \<**SS Screening Indicator**: bit string(2)\>
    \<SoLSA Capability : bit\>
    \<**Spare bits**\>
    \<**Spare bit**\>
    \<Extended GEA bits\>
    \<**Spare bit**\>;

\<GEA1 bits\> ::= \< **GEA/1** :bit\>;

\<Extended GEA bits\> ::= \<GEA/2:bit\>\<GEA/3:bit\>\< GEA/4:bit \>\< GEA/5:bit \>\< GEA/6:bit \>\<GEA/7:bit\>;

\<Spare bits\> ::= null | {\<spare bit\> \< **Spare bits** \>};

SS Screening Indicator
    0 0   defined in GSM 04.80
    0 1   defined in GSM 04.80
    1 0   defined in GSM 04.80
    1 1   defined in GSM 04.80

SM capabilities via dedicated channels
    0   Mobile station does not support mobile terminated point to point SMS via dedicated signalling channels
    1   Mobile station supports mobile terminated point to point SMS via dedicated signalling channels

SM capabilities via GPRS channels
    0   Mobile station does not support mobile terminated point to point SMS via GPRS packet data channels
    1   Mobile station supports mobile terminated point to point SMS via GPRS packet data channels

UCS2 support
This information field indicates the likely treatment by the mobile station of UCS2 encoded character strings.
    0   the ME has a preference for the default alphabet (defined in GSM 03.38) over UCS2.
    1   the ME has no preference between the use of the default alphabet and the use of UCS2.

GPRS Encryption Algorithm GEA/1
0   encryption algorithm **GEA/1**not available
1   encryption algorithm **GEA/1** available

SoLSA Capability
    0   The ME does not support SoLSA.
    1   The ME supports SoLSA.

GPRS Encryption Algorithm GEA/2
0   encryption algorithm **GEA/2** not available
1   encryption algorithm **GEA/2** available

GPRS Encryption Algorithm GEA/3
0   encryption algorithm **GEA/3** not available
1   encryption algorithm **GEA/3** available

GPRS Encryption Algorithm GEA/4
0   encryption algorithm **GEA/4** not available
1   encryption algorithm **GEA/4** available

GPRS Encryption Algorithm GEA/5
0   encryption algorithm **GEA/5** not available
1   encryption algorithm **GEA/5** available

GPRS Encryption Algorithm GEA/6
0   encryption algorithm **GEA/6** not available
1   encryption algorithm **GEA/6** available

GPRS Encryption Algorithm GEA/7
0   encryption algorithm **GEA/7** not available
1   encryption algorithm **GEA/7** available

Source:	**CN1**
To:	**SMG2**
Title:	**Reply to LS on Correction for mobile stations staying in GMM READY virtually for ever**

N1 thanks SMG2 for their LS on " Correction for mobile stations staying in GMM READY virtually for ever " in Tdoc 821/00.

N1 has discussed this issue, and a solution which is mandatory for R99 has been agreed in N1 #12.

The CR's to 24.007, 24.008, 23.060 and 04.64 R99 are attached for information.

Title: **Liaison Statement on the introduction of 3G MS capabilities in MS classmark 3**

Source: **3GPP TSG CN WG1**

TO: **SMG2, SMG2 WPA**

Cc:

WI: **GSM/UMTS Interworking**

Contact Person:
>   **Name: Duncan Mills**
>   **E-mail Address:** duncan.mills@vf.vodafone.co.uk
>   **Tel. Number: +44 1635 676074**

Date: **24th May 2000**

_____

TSG CN WG1 thanks SMG2 WPA for their liaison statement (Tdoc SMG2-00-954) on the introduction of MS capabilities in MS classmark 3.

The CR attached was presented to the CN1 delegates by Vodafone AirTouch during our meeting in Hawaii and was agreed. It will be submitted to TSG CN plenary #8 in June.

CN1 also asks SMG2A to confirm to us whether or not similar changes for the PS domain have been considered.

N1-000697.zip

To:	TSG-S3, TSG CN
cc:	SMG, TSG N4
Source:	TSG-N1
Title:	Reply to LS on "GPRS ciphering "
Date:	2000-05-26

Support for multiple GPRS ciphering algorithms in GSM 04.08/TS 24.008

N1 thanks S3 for their LS on "GPRS ciphering" in Tdoc S3-000690. From this document, TSG N1 note the following:

> **"Support for multiple GPRS ciphering algorithms in GSM 04.08/TS 24.008**
>
> "SA3/SMG10 has reviewed GSM 04.08/TS 24.008 and has found that the ME does not have the ability to signal to the SGSN information about its GPRS ciphering capabilities other than whether it supports GEA/1. **The ME must have the ability to signal its capabilities on 7 GPRS ciphering algorithms.** SA3/SMG10 suggests that the MS network capability information element be extended by a second octet and that part of the additional bits are used to indicate the capability to support GEA/2, …, GEA/7. SA3/SMG10/SMG10 believes changes should be carried out at least starting **from Release 98**, as we propose – and hope to be endorsed – that support for GEA/2 is optional in Release 98 and mandatory for Release 99 from end of 2002 onwards.
>
> *We urge CN1/SMG3 to resolve this issue. "*

N1 has discussed the topic "Support for multiple GPRS ciphering algorithms in GSM 04.08/TS 24.008".

N1 #12 has agreed TS 24.008 R99 which can be found attached to this LS. With this change, the Rel 99 MS has ability to signal its capabilities on 7 GPRS ciphering algorithms to the network in the "MS Network Capability" IE which has been extended R99. TSG N1 also has prepared the corresponding change to Rel 98, but would like to have this issue raised at the TSG CN plenary level to the address the issues raised by these functional changes to GPRS.

TSG N1 has concerns in introducing new functional requirements to GPRS Rel 98 at this late stage. TSG N1 note that GPRS ciphering information is also carried on GTP protocol on the Gn interface, and the impact of this to roaming needs to be considered by GTP experts (TSG N4) as this CR introduces inconsistencies between the TS 24.008 Rel 98 and GTP protocols in Rel 97/98. TSG N1 would like to highlight that this proposed enhancements introduces inconsistencies between GPRS Rel 97 and GPRS Rel 98. TSG N1 has concerns that this may complicate interworking

TSG S3 is requested to consider whether it would be acceptable to have these new functional enhancement to GPRS from Rel 99 onwards and not GPRS Rel 98, considering that the support is mandatory from December 2002.