3GPP TSG_CN
Plenary Meeting #9, Oahu, Hawaii
20th – 22nd September 2000.

Tdoc NP-000487

Source: TSG_N WG 4

Title: CRs to R97, R98 and R99 Work Item GPRS

Agenda item: 6.22.3

Document for: APPROVAL

Introduction:

This document contains 17 CRs on R97, R98, R99 Work Item GPRS, that have been agreed by TSG_N WG4, and is forwarded to TSG_N Plenary meeting #9 for approval.

SM	TDoc	SPEC	CR	REV	PHAS	VERS	SUBJECT	CAT
CN9	N4-000695	09.60	A096		R97	6.8.0	Addition of MS Not Reachable Reason to Send Routing	F
CN9	N4-000589	09.60	A092	1	R97	6.8.0	Encoding of IMSI	F
CN9	N4-000617	09.60	A089	2	R97	6.8.0	MM Context information coding clarification	F
CN9	N4-000696	09.60	A097		R98	7.5.0	Addition of MS Not Reachable Reason to Send Routing	A
CN9	N4-000773	09.60	A095	1	R98	7.5.0	Coding of TI in PDP Context IE	F
CN9	N4-000581	09.60	A094		R98	7.5.0	Removal of IHOSS from GTP	F
CN9	N4-000588	09.60	A091	1	R98	7.5.0	Encoding of IMSI	F
CN9	N4-000618	09.60	A090	2	R98	7.5.0	MM Context information coding clarification	A
CN9	N4-000774	29.060	138	1	R99	3.5.0	Coding of TI in PDP Context	A
CN9	N4-000582	29.060	133		R99	3.5.0	Removal of IHOSS from GTP	A
CN9	N4-000733	29.060	141	2	R99	3.5.0	Categorize Error indication as the GTP-U message	F
CN9	N4-000595	29.060	131	1	R99	3.5.0	Security parameter transport in case of 2G-3G interworking	F
CN9	N4-000590	29.060	135		R99	3.5.0	Addition of MS Not Reachable Reason to Send Routing	F
CN9	N4-000587	29.060	132	1	R99	3.5.0	Encoding of IMSI	A
CN9	N4-000503	29.060	130		R99	3.5.0	Signalling messages in GTP	F
CN9	N4-000502	29.060	129		R99	3.5.0	IPv6 support for Charging Gateway Address	F
CN9	N4-000445	29.060	121		R99	3.5.0	Definition of TEID value in GTP-U header	D

Document N4-000617
Revision of N4-000521

3GPP TSG CN WG4
28 Aug – 1 September 2000
Seattle, USA

e.g. for 3GPP use the format TP-99xxx
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CHANGE REQUEST

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09.60	CR	A089r2	Current Version:	6.8.0

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

For submission to:	CN#09	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

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		UTRAN / Radio		Core Network	X

Source: N4 **Date:** 21.8.2000

Subject: MM Context information coding clarification

Work item: GPRS

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	X
C	Functional modification of feature		Release 98	
D	Editorial modification		Release 99	
			Release 00	

Reason for change:
IN the MM Context information element the Coding of DRX parameter and MS Network Capability parameter is ambiguous.
GSM 04.08 does not define IEI for "MS Network Capability" , therefore it is not clear to include the IEI elements or not.

It is proposed not to include the IEIs.

Clauses affected: 7.9.19

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: Similar change has been agreed in the R99 version of the spec.

7.9.19 MM Context

The MM Context information element contains the Mobility Management, MS and security parameters that are necessary to transfer between SGSNs at the Inter SGSN Routeing Update procedure.

The Ciphering Key Sequence Number (CKSN) is described in GSM 04.08. Possible values are integers in the range [0; 6]. The value 7 is reserved.

The Used Cipher indicates the ciphering algorithm that is in use.

Kc is the ciphering key currently used by the old SGSN.

The Triplet array contains triplets encoded as the value in the Authentication Triplet information element.

The DRX parameter indicates whether the MS uses DRX mode or not.

MS Network Capability provides the network with information concerning aspects of the MS related to GPRS.

The DRX parameter includes only the value part of *the DRX parameter IE* defined in GSM 04.08 and the MS Network Capability includes the length and the value part of the *MS network capability IE* defined in GSM 04.08~~ are coded as described in GSM 04.08~~.

The two octet Container Length holds the length of the Container, excluding the Container Length octets.

The Container contains one or several optional information elements as described in the sub-clause 'Overview', from the clause 'General message format and information elements coding' in GSM 04.08.

Octets	Bits 8	7	6	5	4	3	2	1
1	Type = 129 (Decimal)							
2-3	Length							
4	spare 1 1 1 1 1					CKSN		
5	spare 1 1		No of Triplets			Used Cipher		
6-13	Kc							
14-m	Triplet[0..4]							
(m+1)-(m+2~~3~~)	DRX parameter							
(m+3~~4~~)-(m+3+k~~6~~)	MS Network Capability							
(m+4+k~~7~~)-(m+5+k~~8~~)	Container length							
(m+6+k~~9~~)-n	Container							

NOTE: k is the value of the MS Network Capability length indicator (GSM 04.08).

Document N4-000618
Revision of N4-000522

3GPP TSG CN WG4
28 Aug – 1 September 2000
Seattle,USA

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09.60	CR	A090r2	Current Version:	7.5.0

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

For submission to:	CN#09	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

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 [ ] UTRAN / Radio [ ] Core Network [X]

Source: N4 **Date:** 21.8.2000

Subject: MM Context information coding clarification

Work item: GPRS

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

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

Release:

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

Reason for change:
IN the MM Context information element the Coding of DRX parameter and MS Network Capability parameter is ambiguous.
GSM 04.08 does not define IEI for "MS Network Capability" , therefore it is not clear to include the IEI elements or not.

It is proposed not to include the IEIs.

Clauses affected: 7.9.19

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: Similar change has been agreed in the R99 version of the spec.

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The Used Cipher indicates the ciphering algorithm that is in use.

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2-3	Length							
4	spare		1	1	1	1	CKSN	
5	spare	1	1	No of Triplets			Used Cipher	
6-13	Kc							
14-m	Triplet[0..4]							
(m+1)-(m+2~~3~~)	DRX parameter							
(m+3~~4~~)-(m+3+k~~6~~)	MS Network Capability							
(m+4+k~~7~~)-(m+5+k~~8~~)	Container length							
(m+6+k~~9~~)-n	Container							

NOTE: k is the value of the MS Network Capability length indicator (GSM 04.08)

3GPP TSG CN WG4 Meeting #3
Seattle, 28th August - 1st September 2000

Document N4-000588
e.g. for 3GPP use the format TP-99xxx
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CHANGE REQUEST

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09.60	CR	A091r1	Current Version:	7.5.0

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

For submission to:	CN #09	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

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 [ ] UTRAN / Radio [ ] Core Network [X]

Source: N4 **Date:** 10.July.2000

Subject: Encoding of IMSI in 09.60

Work item: GPRS

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

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

Reason for change:
In the current specification the encoding of IMSI referes to 04.08. In 04.08 the encoding of IMSI is defined in the mobile identity IEI (see figure 10.5.4/TS04.08: TAG, lenght, type of identity and first octet). In 09.60 lenght field and type of identity is not needed because type is always IMSI.
This CR proposes to base the encoding on 09.02 where the encoding for IMSI is defined in the following way (section 17.7.8):
-- bits 8765 of octet n encoding digit 2n
-- bits 4321 of octet n encoding digit 2(n-1) +1

Clauses affected: 7.7.2

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.

7.7.2 International Mobile Subscriber Identity (IMSI)

The IMSI shall be the subscriber identity of the MS. The IMSI is defined in GSM 03.03.

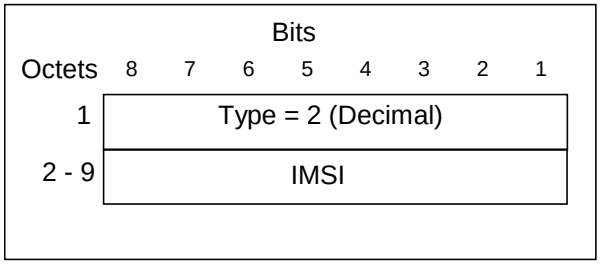

Figure 10: IMSI Information Element

The ~~encoding of the~~ IMSI is TBCD-coded with a fixed length of 8 octets. Bits 8765 of octet n+1 encodes digit 2n, bits 4321 of octet n+1 encodes digit 2n-1~~ information element is defined in GSM 04.08~~. Unused half octets~~IMSI digits that are not used~~ shall be coded as binary "1 1 1 1".

3GPP TSG CN WG4 Meeting #3
Seattle, 28th August - 1st September 2000

Document N4-000589
e.g. for 3GPP use the format TP-99xxx
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CHANGE REQUEST

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09.60	CR	A092r1	Current Version:	6.8.0

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

For submission to:	CN #09	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

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 [ ] UTRAN / Radio [ ] Core Network [X]

Source: N4 **Date:** 15.August.2000

Subject: Encoding of IMSI in 09.60

Work item: GPRS

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	X
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	
				Release 00	

Reason for change:
Category C3
In the current specification the encoding of IMSI referes to 04.08. In 04.08 the encoding of IMSI is defined in the mobile identity IEI (see figure 10.5.4/TS04.08: TAG, lenght, type of identity and first octet). In 09.60 lenght field and type of identity is not needed because type is always IMSI.
This CR proposes to base the encoding on 09.02 where the encoding for IMSI is defined in the following way (section 17.7.8):
-- bits 8765 of octet n encoding digit 2n
-- bits 4321 of octet n encoding digit 2(n-1) +1

Clauses affected: 7.7.2

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: Category C3

7.7.2 International Mobile Subscriber Identity (IMSI)

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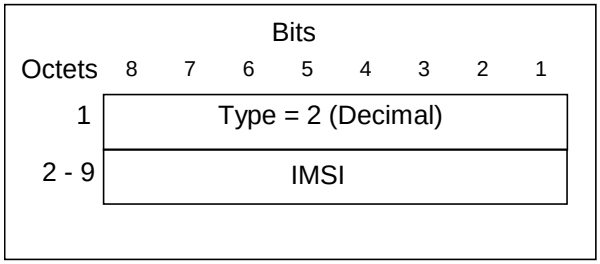

Figure 10: IMSI Information Element

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3GPP TSG-CN-WG4 meeting #4
Seattle, USA, 28 August - 1 September 2000

***Document* N4-000581**
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or for SMG, use the format P-99-xxx

CHANGE REQUEST

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09.60	CR	A094	Current Version:	7.5.0

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

For submission to: CN#09	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑	for information		non-strategic	X	

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		UTRAN / Radio	X	Core Network	X

Source: N4 **Date:** 21 August 2000

Subject: Removal of OSP:IHOSS for R98

Work item: GPRS

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	X
D	Editorial modification			Release 99	
				Release 00	

Reason for change:
In TdocS1-000345 (SA1#8 - april 2000) S1 notes that CN3 have deleted the support of Interworking to ISDN / PSTN. S1 has also discussed the support of the IHOSS service and there is no support in S1 for this feature. Therefore S1 sees no need for the PDP type OSP, that was introduced to support these services, and S1 has agreed with N3's recommendation that this feature be deleted. S1 will raise CRs to remove this feature from R98, R99 and R00.
This CR deletes the references to OSP:IHOSS in 09.60 R98

Category: C3

Clauses affected: 7.9.18

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.

7.9.18 End User Address

The purpose of the End User Address information element shall be to supply protocol specific information of the external packet data network accessed by the GPRS subscriber.

The Length field value shall be 2 in an End User Address information element with an empty PDP Address.

The PDP Type defines the end user protocol to be used between the external packet data network and the MS and is divided into an Organization field and a Number field.

The PDP Type Organization is the organization that is responsible for the PDP Type Number field and the PDP Address format.

For X.25 the PDP Type Organization is ETSI and the PDP Type Number is 0 . The PDP Address shall be in the X.121 format for X.25. For PPP the PDP Type Organization is ETSI and the PDP Type Number is 1 and there shall be no address in the End User Address IE. In this case the address is negotiated later as part of the PPP protocol. ~~For OSP:IHOSS the PDP Type Organisation is ETSI and the PDP Type Number is 2 and there shall be no address in the End User Address IE. For OSP:IHOSS the PDP Type Organisation is ETSI and the PDP Type Number is 2 and there shall be no address in the End User Address IE.~~

If the PDP Type Organization is IETF, the PDP Type Number is a compressed number (i.e. the most significant HEX(00) is skipped) in the “Assigned PPP DLL Protocol Numbers” list in the most recent “Assigned Numbers” RFC (RFC 1700 or later). The most recent “Assigned PPP DLL Protocol Numbers” can also be found using the URL = ftp://ftp.isi.edu/in-notes/iana/assignments/ppp-numbers.

The PDP Address shall be the address that this PDP context of the MS is identified with from the external packet data network.

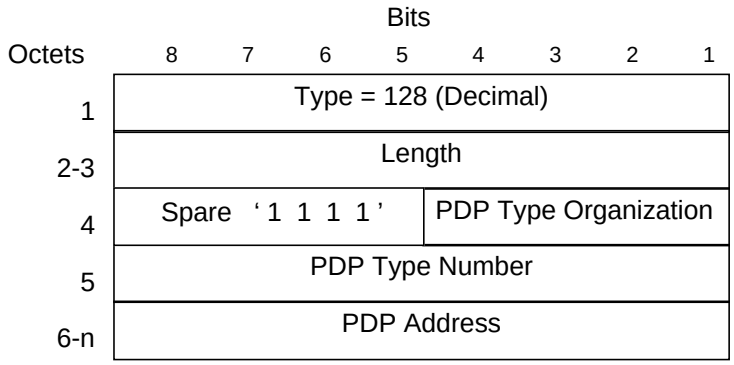


Figure 27: End User Address information element

Table 35: PDP Type Organization values

PDP Type Organization	Value (Decimal)
ETSI	0
IETF	1
All other values are reserved	

Table 36: ETSI defined PDP Type values

PDP Type Number	Value (Decimal)
X.25	0
PPP	1
~~OSP:IHOSS~~	~~2~~
All other values are reserved	

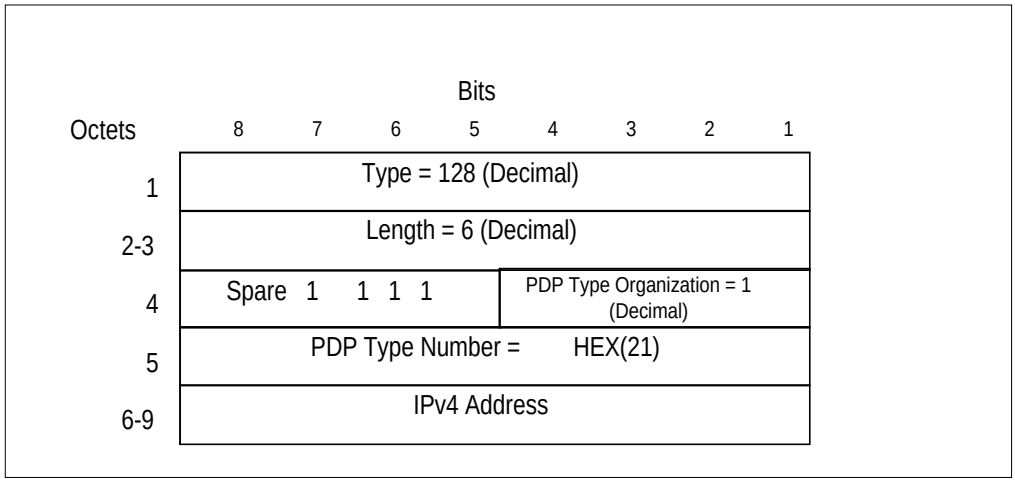


Figure 26: End User Address information element for IPv4

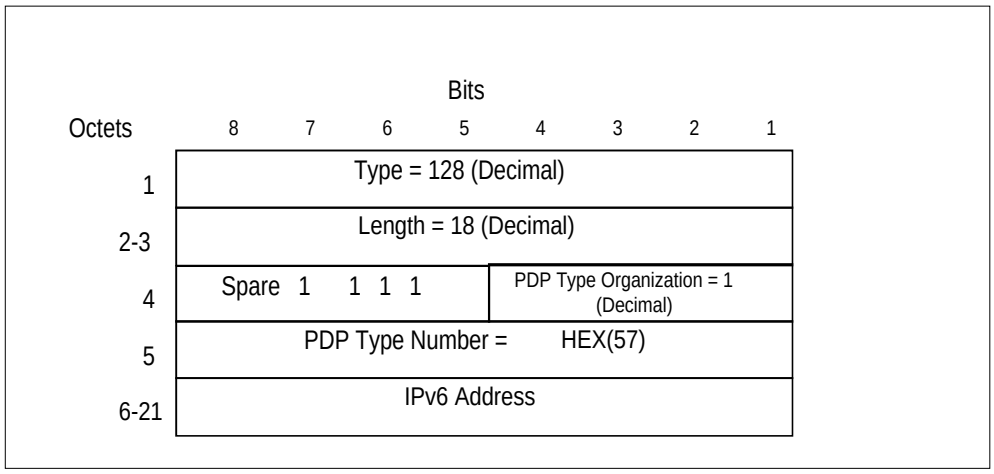
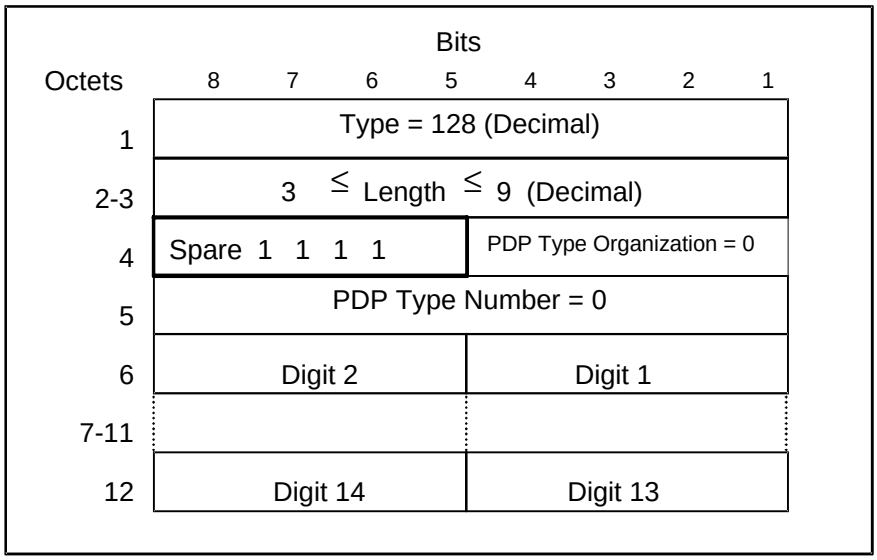


Figure 27: End User Address information element for IPv6



NOTE: Digit 1 contains the first BCD coded digit of the X.121 address. If the X.121 address has an odd number of digits, the last BCD digit shall be padded with HEX(F).

Figure 28: End User Address information element for X.25

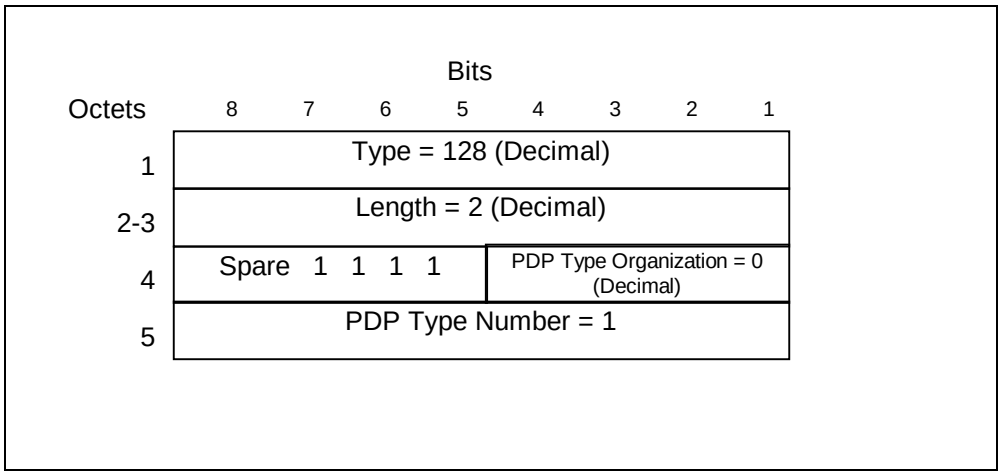
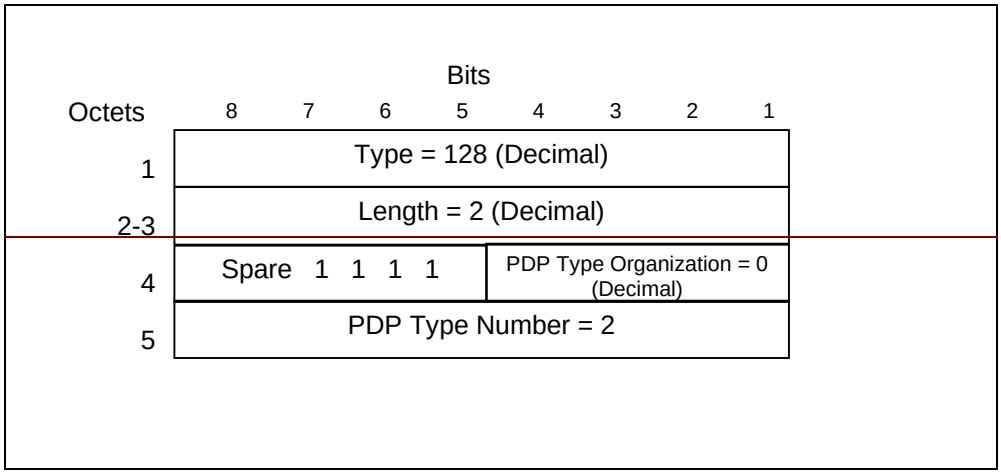


Figure 29: End User Address information element for PPP



~~**Figure 30: End User Address information element for OSP:IHOSS**~~

3GPP TSG CN WG4 Meeting #4
Seattle, 28th August - 1st September 2000

Document N4-000773
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CHANGE REQUEST

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09.60	CR	A095r1	Current Version:	3.5.0

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

For submission to:	CN#09	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

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 [ ] UTRAN / Radio [ ] Core Network [X]

Source: N4 **Date:** 10.August.2000

Subject: Coding of TI in PDP Context IE

Work item: GPRS

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 X
D	Editorial modification			Release 99
				Release 00

Reason for change:
Category C3
The PDP context IE contains the TI (transaction Identifier) to use for communication with the MS. No definition is given how the used TI is inserted into the PDP context IE; is the TI stored in the PDP context as sent from SGSN to the MS, or as received from the MS? Therefore the receiving SGSN in case of an Inter SGSN change might not use the TI properly.
Proposal: Define, how the TI is to be coded in the PDP Context IE.

Clauses affected: 7.7.20

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.

7.9.20 PDP Context

The PDP Context information element contains the Session Management parameters, defined for an external packet data network address, that are necessary to transfer between SGSNs at the Inter SGSN Routeing Area Update procedure.

NSAPI is an integer value in the range [0; 15].

The NSAPI points out the affected PDP context.

The SAPI indicates the LLC SAPI which is associated with the NSAPI.

Transaction Identifier is the 4 bit Transaction Identifier used in the GSM 04.08 Session Management messages which control this PDP Context. The latest Transaction Identifier sent from SGSN to MS is stored in the PDP context IE.

Reordering Required (Order) indicates whether the SGSN shall reorder T-PDUs before delivering the T-PDUs to the MS.

VPLMN Address Allowed (VAA) indicates whether the MS is allowed to use the APN in the domain of the HPLMN only, or additionally the APN in the domain of the VPLMN.

Quality of Service Subscribed (QoS Sub), Quality of Service Requested (QoS Req) and Quality of Service Negotiated (QoS Neg) are encoded as described in section 'Quality of Service (QoS) Profile'.

The Sequence Number Down is the number of the next T-PDU that shall be sent from the new SGSN to the MS. The number is associated to the Sequence Number from the GTP Header of an encapsulated T-PDU.

The Sequence Number Up is the number that new SGSN shall use as the Sequence Number in the GTP Header for the next encapsulated T-PDU from the MS to the GGSN.

The Send N-PDU Number is used only when acknowledged peer-to-peer LLC operation is used for the PDP context. The Send N-PDU Number is the N-PDU number to be assigned by SNDCP to the next downlink N-PDU received from the GGSN. It shall be set to 255 if unacknowledged peer-to-peer LLC operation is used for the PDP context.

The Receive N-PDU Number is used only when acknowledged peer-to-peer LLC operation is used for the PDP context. The Receive N-PDU Number is the N-PDU number expected by SNDCP from the next uplink N-PDU to be received from the MS. It shall be set to 255 if unacknowledged peer-to-peer LLC operation is used for the PDP context.

The Uplink Flow Label Signalling is the Flow Label used between the old SGSN and the GGSN in uplink direction for signalling purpose. It shall be used by the new SGSN within the GTP header of the Update PDP Context Request message.

The PDP Type Organization and PDP Type Number are encoded as in the End User Address information element.

The PDP Address Length represents the length of the PDP Address field, excluding the PDP Address Length octet.

The PDP Address is an octet array with a format dependent on the PDP Type. The PDP Address is encoded as in the End User Address information element if the PDP Type is IPv4, IPv6 or X.25.

The GGSN Address Length represents the length of the GGSN Address field, excluding the GGSN Address Length octet.

The old SGSN includes the GGSN Address for signalling that it has received from GGSN at PDP context activation or update.

The APN is the APN in use in the old SGSN. I.e. the APN sent in the Create PDP Context request message.

The spare bits x indicate unused bits which shall be set to 0 by the sending side and which shall not be evaluated by the receiving side.

1	Type = 130 (Decimal)				
2-3	Length				
4	Res-erved	VAA	Res-erved	Order	NSAPI
5	X	X	X	X	SAPI
6-8	QoS Sub				
9-11	QoS Req				
12-14	QoS Neg				
15-16	Sequence Number Down (SND)				
17-18	Sequence Number Up (SNU)				
19	Send N-PDU Number				
20	Receive N-PDU Number				
21-22	Uplink Flow Label Signalling				
23	Spare 1 1 1 1				PDP Type Organization
24	PDP Type Number				
25	PDP Address Length				
26-m	PDP Address [1..63]				
m+1	GGSN Address for signalling Length				
(m+2)-n	GGSN Address for signalling [4..16]				
n+1	APN length				
(n+2)-o	APN				
o+1	Spare (sent as 0 0 0 0)				Transaction Identifier

Figure 32: PDP Context information element

Table 38: Reordering Required values

Reordering Required	Value (Decimal)
No	0
Yes	1

Table 39: VPLMN Address Allowed values

VPLMN Address Allowed	Value (Decimal)
No	0
Yes	1

3GPP TSG CN4 Meeting #4
Seattle, 28th August - 1st September 2000

Document N4-000695

CHANGE REQUEST

09.60	CR	A096	Current Version:	6.8.0

For submission to:	CN#09	for approval	X	strategic	
		for information		non-strategic	X

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 [ ] UTRAN / Radio [ ] Core Network [X]
(at least one should be marked with an X)

Source: N4 **Date:** 29th August 2000

Subject: Addition of MS Not Reachable Reason to Send Routing Information For GPRS Response

Work item: GPRS

Category:

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

Release:

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

Reason for change: To align 09.60 with 09.02 and 03.60.
C3 Category

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:

7.6.2 Send Routeing Information for GPRS Response

The GTP-MAP protocol-converting GSN sends a Send Routeing Information for GPRS Response message as a response to the Send Routeing Information for GPRS Request message to the GGSN that sent the request.
The Cause value indicates if the GTP-MAP protocol-converting GSN accepted the request or not.
Possible Cause values are:

- 'Request Accepted'
- 'No resources available'
- 'Service not supported'
- 'System failure'
- 'Mandatory IE incorrect'
- 'Mandatory IE missing'
- 'Optional IE incorrect'
- 'Invalid message format'
- 'Version not supported'.

The MAP Cause information element contains the MAP error code received ~~cause value~~ from the HLR and shall not be included if the Cause contains another value than 'Request accepted'.
The GSN Address information element contains the IP address of the SGSN and shall not be included if the Cause contains another value than 'Request accepted'.
It is an implementation issue what to do if the Cause or MAP Cause indicates that no location information is available.
The MS not Reachable Reason information element indicates the reason for the setting of the MNRG flag and shall not be included if the Cause contains another value than 'Request accepted'.
The optional Private Extension contains vendor or operator specific information.

Table 20: Information elements in a Send Routeing Information for GPRS Response

Information element	Presence requirement	Reference
Cause	Mandatory	7.9.1
IMSI	Mandatory	7.9.2
MAP Cause	Optional	7.9.9
GSN Address	Optional	7.9.23
MS not Reachable Reason	Optional	7.7.16A
Private Extension	Optional	7.9.26

.....

7.6.4 Failure Report Response

The GTP-MAP protocol-converting GSN sends a Failure Report Response message as a response to the Failure Report Request message to the GGSN that sent the request.
The Cause value indicates if the GTP-MAP protocol-converting GSN accepted the request or not.
Possible Cause values are:

- 'Request Accepted'
- 'No resources available'
- 'Service not supported'
- 'System failure'

- ‘Mandatory IE incorrect’
- ‘Mandatory IE missing’
- ‘Optional IE incorrect’
- ‘Invalid message format’
- ‘Version not supported’.

The MAP Cause information element contains the MAP error code received~~cause value~~ from the HLR and shall not be included if the Cause contains another value than ‘Request accepted’
It is an implementation issue what to do if the Cause or MAP Cause indicates that the HLR has not received the request or rejected the request.
The optional Private Extension contains vendor or operator specific information.

Table 22: Information elements in a Failure Report Response

Information element	Presence requirement	Reference
Cause	Mandatory	7.9.1
MAP Cause	Optional	7.9.9
Private Extension	Optional	7.9.26

…..

…..

7.7.16A MS Not Reachable Reason

The MS Not Reachable Reason indicates the reason for the setting of the MNRG flag.

Octets	Bits 8	7	6	5	4	3	2	1
1	Type = 19 (Decimal)							
2	Reason for Absence							

Reason for Absence is defined in GSM 03.40

Figure 23A: MS Not Reachable Reason Information Element

3GPP TSG CN4 Meeting #4
Seattle, 28th August - 1st September 2000

Document N4-000696

CHANGE REQUEST

09.60	CR	A097	Current Version:	7.5.0

For submission to:	CN#09	for approval	X	strategic	
		for information		non-strategic	X

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 [ ] UTRAN / Radio [ ] Core Network [X]
(at least one should be marked with an X)

Source: N4 **Date:** 29th August 2000

Subject: Addition of MS Not Reachable Reason to Send Routing Information For GPRS Response

Work item: GPRS

Category:

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

Release:

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

Reason for change: To align 09.60 with 09.02 and 03.60.
C3 Category

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:

7.6.2 Send Routeing Information for GPRS Response

The GTP-MAP protocol-converting GSN sends a Send Routeing Information for GPRS Response message as a response to the Send Routeing Information for GPRS Request message to the GGSN that sent the request.
The Cause value indicates if the GTP-MAP protocol-converting GSN accepted the request or not.
Possible Cause values are:

- 'Request Accepted'
- 'No resources available'
- 'Service not supported'
- 'System failure'
- 'Mandatory IE incorrect'
- 'Mandatory IE missing'
- 'Optional IE incorrect'
- 'Invalid message format'
- 'Version not supported'.

The MAP Cause information element contains the MAP error code received ~~cause value~~ from the HLR and shall not be included if the Cause contains another value than 'Request accepted'.
The GSN Address information element contains the IP address of the SGSN and shall not be included if the Cause contains another value than 'Request accepted'.
It is an implementation issue what to do if the Cause or MAP Cause indicates that no location information is available.
The MS not Reachable Reason information element indicates the reason for the setting of the MNRG flag and shall not be included if the Cause contains another value than 'Request accepted'.
The optional Private Extension contains vendor or operator specific information.

Table 20: Information elements in a Send Routeing Information for GPRS Response

Information element	Presence requirement	Reference
Cause	Mandatory	7.9.1
IMSI	Mandatory	7.9.2
MAP Cause	Optional	7.9.9
GSN Address	Optional	7.9.23
MS not Reachable Reason	Optional	7.7.16A
Private Extension	Optional	7.9.26

.....

7.6.4 Failure Report Response

The GTP-MAP protocol-converting GSN sends a Failure Report Response message as a response to the Failure Report Request message to the GGSN that sent the request.
The Cause value indicates if the GTP-MAP protocol-converting GSN accepted the request or not.
Possible Cause values are:

- 'Request Accepted'
- 'No resources available'
- 'Service not supported'
- 'System failure'
- 'Mandatory IE incorrect'

- ‘Mandatory IE missing’
- ‘Optional IE incorrect’
- ‘Invalid message format’
- ‘Version not supported’.

The MAP Cause information element contains the MAP error code received~~cause value~~ from the HLR and shall not be included if the Cause contains another value than ‘Request accepted’
It is an implementation issue what to do if the Cause or MAP Cause indicates that the HLR has not received the request or rejected the request.
The optional Private Extension contains vendor or operator specific information.

Table 22: Information elements in a Failure Report Response

Information element	Presence requirement	Reference
Cause	Mandatory	7.9.1
MAP Cause	Optional	7.9.9
Private Extension	Optional	7.9.26

…..

…..

7.7.16A MS Not Reachable Reason

The MS Not Reachable Reason indicates the reason for the setting of the MNRG flag.

Octets	Bits 8	7	6	5	4	3	2	1
1	Type = 19 (Decimal)							
2	Reason for Absence							

Reason for Absence is defined in GSM 03.40

Figure 23A: MS Not Reachable Reason Information Element

3GPP TSG CN4 Meeting #3
Helsinki, Finland, 17th-22nd July 2000

Document N4-000445

CHANGE REQUEST

29.060	CR	121	Current Version:	3.5.0

For submission to: CN#09 — for approval [X] / for information [ ] — strategic [ ] / non-strategic [X]

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 [ ] UTRAN / Radio [ ] Core Network [X]
(at least one should be marked with an X)

Source: N4 **Date:** 6th July 2000

Subject: Define TEID value in GTP-U header

Work item: GPRS

Category:

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

Release:

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

Reason for change:

The TEID value for Echo Request/ Response, Version Not Supported and Supported Extension Headers Notification message in GTP-U should be set to all zeros if the TEID definition in GTP version 1 follows the concept about the TID definition in GTP version 0. However, there is no clear description about the TEID for GTP-U messages that noted above in current GTP version 1 specification.

This problem was resulted due to not enough editorial treatment performed when GTP version 0 specification was transferred to version 1.

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:

FIRST MODIFIED SECTION

9.3.1 Usage of the GTP-U Header

The GTP-U header shall be used as follows:

- Version shall be set to decimal 1 (‘001’).
- Protocol Type (PT) shall be set to '1’.
- If the S field is set to '1' the sequence number field is present otherwise it is set to '0'.
- PN flag: the GTP-U header includes the N-PDU Number field if the PN flag is set to 1.
- Message Type shall be set according to Table 1. The value 255 is used when T-PDUs are transmitted. The value 1 and 2 are used for "Echo" messages. The value 3 for "Version Non Supported" messages.
- Length: Size of the T-PDU excluding the GTP-U header size.
- Sequence Number: This field is present only if the S field is set to 1. The handling of this field is specified in subclause 9.1.1. It shall be used in order to decide whether or not to discard a received T-PDU, as specified in sub-clause 9.3.1.1 Usage of the Sequence Number.
- N-PDU Number: This field shall be included if and only if the PN flag is set to 1. In this case, the old SGSN (or RNC) uses it, at the Inter SGSN Routeing Area Update procedure (or SRNS relocation), to inform the new SGSN (or RNC) of the N-PDU number assigned to T-PDU. If an N-PDU number was not assigned to the T-PDU by PDCP, or if the T-PDU is to be transferred using unacknowledged peer-to-peer LLC operation, then PN shall be set to 0.
- ~~——~~TEID: Contains the Tunnel Endpoint Identifier for the tunnel to which this T-PDU belongs. The TEID shall be used by the receiving entity to find the PDP context, except for the following cases:~~.~~
  - The Echo Request/Response, Supported Extension Headers notification and the Version Not Supported messages, where the Tunnel Endpoint Identifier shall be set to all zeroes.

3GPP TSG CN WG4
17-21 July 2000, Helsinki, Finland

Document N4-000502
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.

29.060	CR	129	Current Version:	3.5.0

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

For submission to:	CN#09	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

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 [ ] UTRAN / Radio [ ] Core Network [X]
(at least one should be marked with an X)

Source: N4 **Date:** 15.07.2000

Subject: IPv6 support for Charging Gateway Address

Work item: GPRS

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:
GTP' has already the IPv6 support (in e.g. the format of the Charging Gateway Address) since v1, but GTP not yet though it should (for compatibility).
Therefore IPv6 format should supported also be in GTP in the Charging Gateway Address information element (that is used in the Create PDP Context Response and the Update PDP Context Response messages), since GTP is used to transfer the Charging Gateway Address from the GGSN to the SGSN.
Otherwise the earlier approved IPv6 support for the Charging Gateway Address in GTP' would not work.

Clauses affected: 7.7.43 Charging Gateway Address

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:
In GTP' the corresponding information element name is Address of Recommended Node. This IE is used in the Redirection Request message.

Similar change has been agreed in the GSM 12.15 version 7.5.0 Release 1998 and the 3G TS 32.015 specification "Charging & Billing; GSM call and event data for the Packet Switched (PS) domain (Release 1999)".

7.7.43 Charging Gateway Address

The Charging Gateway Address information element contains an IPv4 or IPv6 address of a Charging Gateway.

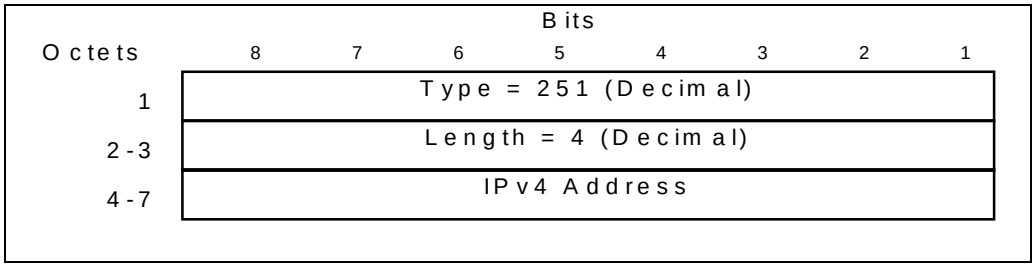

Figure 58a: IPv4 Charging Gateway Address Information Element

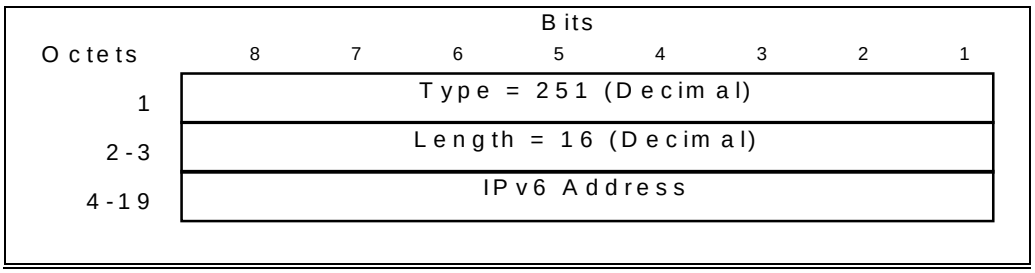

Figure 58b: IPv6 Charging Gateway Address Information Element

3GPP TSG CN WG4
17-21 July 2000, Helsinki, Finland

Document N4-000503
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.

29.060	CR	130	Current Version:	3.5.0

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

For submission to:	CN#09	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

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 [ ] UTRAN / Radio [ ] Core Network [X]

Source: N4 **Date:** 15.07.2000

Subject: Signalling messages in GTP

Work item: GPRS

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: In the Table 1 of 3G TS 29.060 "Signalling Messages in GTP", there are 3 errors: The following GTP messages have not been marked as belonging also to GTP' (in addition to GTP-C and GTP-U) though they according to GSM 12.15 and 3G TS 32.015 should: Echo Request, Echo Response and Version Not Supported.

Clauses affected: 7.1 Message Formats

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: The GTP' documentation has contained the Echo Request and Echo Response messages already from October 1998 in GSM 12.15 "GPRS Charging", and later also in the 3G TS 32.015 "Charging & Billing; GSM call and event data for the Packet Switched (PS) domain (Release 1999)".

The GTP' documentation has contained the Version Not Supported message already from February 1999 in GSM 12.15 (and later also in the 3G TS 32.015).

Table 1: Signalling Messages in GTP

Message Type value (Decimal)	Message	Reference	GTP-C	GTP-U	GTP'
0	For future use. Shall not be sent. If received, shall be treated as an Unknown message.				
1	Echo Request	7.2.1	X	X	X
2	Echo Response	7.2.2	X	X	X
3	Version Not Supported	7.2.3	X	X	X
4	Node Alive Request	GSM 12.15			X
5	Node Alive Response	GSM 12.15			X
6	Redirection Request	GSM 12.15			X
7	Redirection Response	GSM 12.15			X
8-15	For future use. Shall not be sent. If received, shall be treated as an Unknown message.				
16	Create PDP Context Request	7.3.1	X		
17	Create PDP Context Response	7.3.2	X		
18	Update PDP Context Request	7.3.3	X		
19	Update PDP Context Response	7.3.4	X		
20	Delete PDP Context Request	7.3.5	X		
21	Delete PDP Context Response	7.3.6	X		
22-25	For future use. Shall not be sent. If received, shall be treated as an Unknown message.				
26	Error Indication	7.3.7	X		
27	PDU Notification Request	7.3.8	X		
28	PDU Notification Response	7.3.9	X		
29	PDU Notification Reject Request	7.3.10	X		
30	PDU Notification Reject Response	7.3.11	X		
31	Supported Extension Headers Notification	7.2.4	X	X	
32	Send Routeing Information for GPRS Request	7.4.1	X		
33	Send Routeing Information for GPRS Response	7.4.2	X		
34	Failure Report Request	7.4.3	X		
35	Failure Report Response	7.4.4	X		
36	Note MS GPRS Present Request	7.4.5	X		
37	Note MS GPRS Present Response	7.4.6	X		
38-47	For future use. Shall not be sent. If received, shall be treated as an Unknown message.				
48	Identification Request	7.5.1	X		
49	Identification Response	7.5.2	X		
50	SGSN Context Request	7.5.3	X		
51	SGSN Context Response	7.5.4	X		
52	SGSN Context Acknowledge	7.5.5	X		
53	Forward Relocation Request	7.5.6	X		
54	Forward Relocation Response	7.5.7	X		
55	Forward Relocation Complete	7.5.8	X		
56	Relocation Cancel Request	7.5.9	X		
57	Relocation Cancel Response	7.5.10	X		
58	Forward SRNS Context	7.5.11	X		
59	Forward Relocation Complete Acknowledge	7.5.x	X		
60	Forward SRNS Context Acknowledge	7.5.x	X		
61-239	For future use. Shall not be sent. If received, shall be treated as an Unknown message.				
240	Data Record Transfer Request	GSM 12.15			X
241	Data Record Transfer Response	GSM 12.15			X
242-254	For future use. Shall not be sent. If received, shall be treated as an Unknown message.				
255	T-PDU	9.3.1		X	

3GPP TSG CN WG4 Meeting #4
Seattle, US, 28 August -1 September 2000

Document **N4-000595**
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.

29.060	**CR**	**131r1**	Current Version:	3.5.0

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

For submission to:	CN#09	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

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 [ ] UTRAN / Radio [ ] Core Network [X]

Source: N4 Date: 18.July.2000

Subject: Security parameter transport in case of 2G <-> 3G interworking

Work item: GPRS

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:

3 possibilities are defined to pass current security parameters within *MM context* IE:
-Security mode value 1 is used for GSM SIM user is roaming in a R99 enviroment.
-Security mode value 2 is used for USIM is roaming in a R99 3G enviroment.
-Security mode value 3 is used for USIM is roaming in a R99 2G enviroment

Security mode value 3, (Figure 42) Kc and quintuplets are defined to support USIM users consuming radio resources from a GPRS cell. The current definition works in case of 2G -> 2G inter SGSN Routing area update (RAU).
In case of a 2G ->3G inter SGSN RAU Kc and Quintuplets are sent but CK and IK are needed. At old SGSN UMTS AKA (authentication and key agreement) was performed according to TS 33.102. The old SGSN (providing 2G access) has the capability to convert CK and IK to Kc in a well defined way.
According to 23.060, the AKA is optional during 2G->3G inter SGSN intersystem change. 3G-SGSN is able (in principle) to convert received Kc to CK and IK, but the result is different from the originally agreed CK and IK. In that case the optional AKA would become mandatory which is against the intention of 23.060..
This CR proposes to transport CK and IK instead of Kc in the case a USIM user is roaming in a GPRS.

Clauses affected: 7.7.28

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.

7.7.28 MM Context

The MM Context information element contains the Mobility Management, MS and security parameters that are necessary to transfer between SGSNs at the Inter SGSN Routeing Area Update procedure.

Security Mode indicates the type of security keys (GSM/UMTS) and Authentication Vectors (quintuplets/triplets) that are passed to the new SGSN.

Ciphering Key Sequence Number (CKSN) is described in 3G TS 24.008. Possible values are integers in the range [0; 6]. The value 7 is reserved. The Ciphering Key Sequence Number is applicable to GSM as well as UMTS security key(s).

Used Cipher indicates the GSM ciphering algorithm that is in use.

Kc is the GSM ciphering key currently used by the old SGSN. Kc shall be present if GSM key is indicated in the Security Mode.

CK is the UMTS ciphering key currently used by the old SGSN. CK shall be present if UMTS keys are indicated in the Security Mode.

IK is the UMTS integrity key currently used by the old SGSN. IK shall be present if UMTS keys are indicated in the Security Mode.

The Triplet array contains triplets encoded as the value in the Authentication Triplet information element The Triplet array shall be present if indicated in the Security Mode.

The Quintuplet array contains Quintuplets encoded as the value in the Authentication Quintuplet information element. The Quintuplet shall be present if indicated in the Security Mode.

DRX parameter indicates whether the MS uses DRX mode or not.

MS Network Capability provides the network with information concerning aspects of the MS related to GPRS.

DRX parameter and the MS Network Capability are coded as described in 3G TS 24.008, the value part only.

The two octets Container Length holds the length of the Container, excluding the Container Length octets.

Container contains one or several optional information elements as described in the sub-clause ‘Overview’, from the clause ‘General message format and information elements coding’ in 3G TS 24.008.

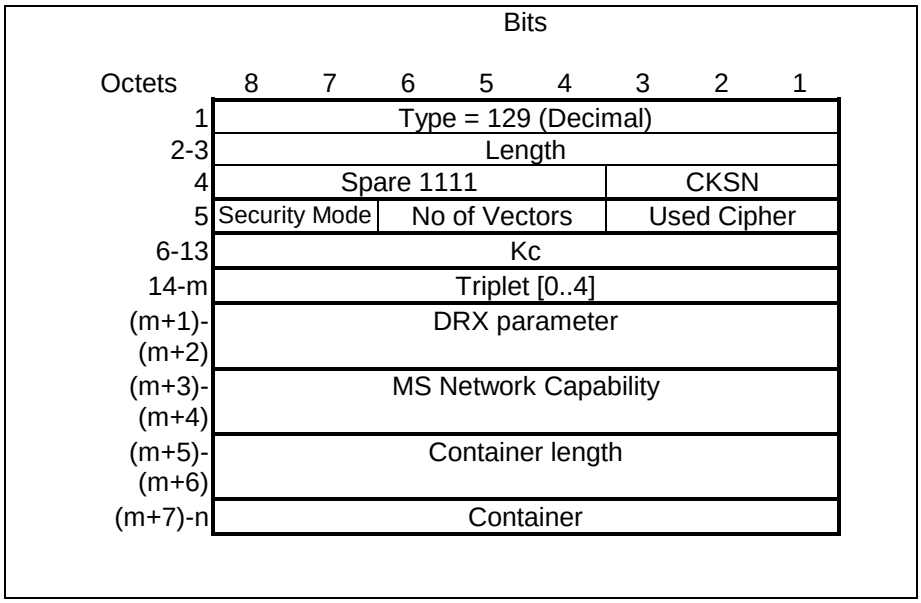

Figure 40: MM Context Information Element with GSM Key and Triplets

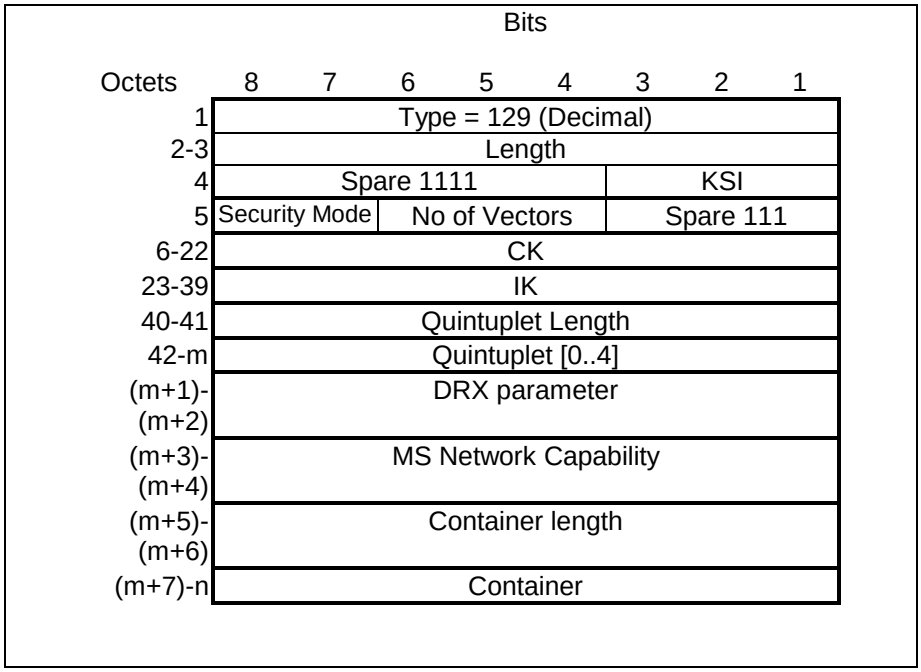

Figure 41: MM Context Information Element with UMTS Keys and Quintuplets

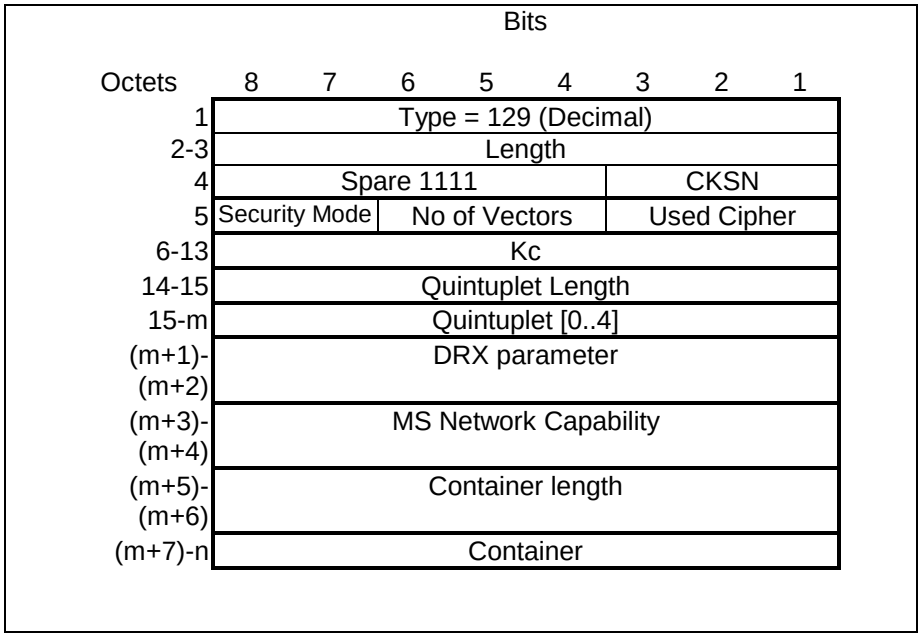

Figure 42: MM Context Information Element with GSM Keys and UMTS Quintuplets

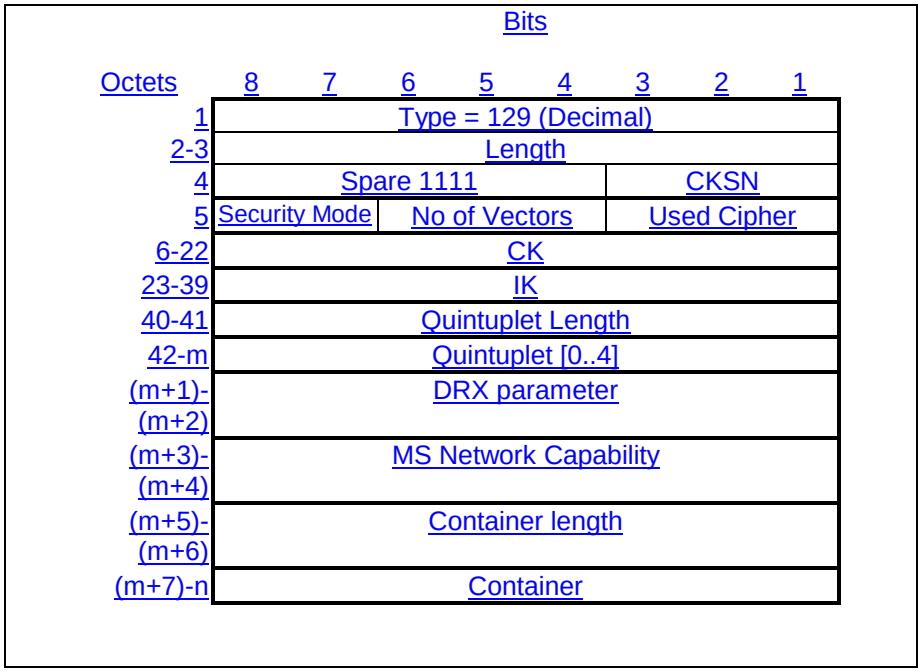

Figure 42A: MM Context Information Element with Used Cipher value,UMTS Keys and Quintuplets

Table 46: Used Cipher Values

Cipher Algorithm	Value (Decimal)
No ciphering	0
GEA/1	1

Table 47: Security Mode Values

Security Type	Value (Decimal)
GSM key and triplets	1
GSM key and quintuplets	3
UMTS keys and quintuplets	2
used cipher value, UMTS Keys and Quintuplets	0

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Document N4-000587
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.

29.060	CR	132r1	Current Version:	3.5.0

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

For submission to:	CN #09	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

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 [ ] UTRAN / Radio [ ] Core Network [X]

Source: N4 **Date:** 15.August.2000

Subject: Encoding of IMSI in 29.060

Work item: GPRS

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

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release	X		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:
In the current specification the encoding of IMSI referes to 24.008. In 24.008 the encoding of IMSI is defined in the mobile identity IEI (see figure 10.5.4/TS24.008: TAG, lenght, type of identity and first octet). In 29.060 lenght field and type of identity is not needed because type is always IMSI.
This CR proposes to base the encoding on 29.002 where the encoding for IMSI is defined in the following way (section 17.7.8):
-- bits 8765 of octet n encoding digit 2n
-- bits 4321 of octet n encoding digit 2(n-1) +1

Clauses affected: 7.7.2

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.

7.7.2 International Mobile Subscriber Identity (IMSI)

The IMSI shall be the subscriber identity of the MS. The IMSI is defined in GSM 23.003.

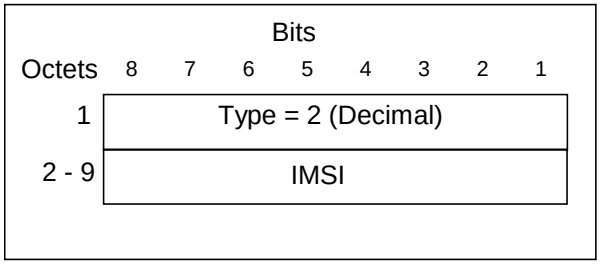

Figure 10: IMSI Information Element

The ~~encoding of the~~ IMSI is TBCD-coded with a fixed length of 8 octets. Bits 8765 of octet n+1 encodes digit 2n, bits 4321 of octet n+1 encodes digit 2n-1~~information element is defined in GSM 24.008~~. Unused half octets ~~IMSI digits that are not used~~ shall be coded as binary "1 1 1 1".

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Document N4-000582
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.

29.060	CR	133	Current Version:	3.5.0

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

For submission to:	CN#09	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

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		UTRAN / Radio	X	Core Network	X

Source: N4 **Date:** 21 August 2000

Subject: Removal of OSP:IHOSS for R99

Work item: GPRS

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

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release	X		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:
In TdocS1-000345 (SA1#8 - april 2000) S1 notes that CN3 have deleted the support of Interworking to ISDN / PSTN. S1 has also discussed the support of the IHOSS service and there is no support in S1 for this feature. Therefore S1 sees no need for the PDP type OSP, that was introduced to support these services, and S1 has agreed with N3's recommendation that this feature be deleted. S1 will raise CRs to remove this feature from R98, R99 and R00.
This CR deletes the references to OSP:IHOSS in 29.060 R99

Clauses affected: 7.7.27

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.

7.7.27 End User Address

The purpose of the End User Address information element shall be to supply protocol specific information of the external packet data network accessed by the GPRS subscriber.

The Length field value shall be 2 in an End User Address information element with an empty PDP Address.

The PDP Type defines the end user protocol to be used between the external packet data network and the MS and is divided into an Organisation field and a Number field.

The PDP Type Organisation is the organisation that is responsible for the PDP Type Number field and the PDP Address format.

For PPP the PDP Type Organisation is ETSI and the PDP Type Number is 1 and there shall be no address in the End User Address IE. In this case the address is negotiated later as part of the PPP protocol. ~~For OSP:IHOSS the PDP Type Organisation is ETSI and the PDP Type Number is 2 and there shall be no address in the End User Address IE.~~

If the PDP Type Organisation is IETF, the PDP Type Number is a compressed number (i.e. the most significant HEX(00) is skipped) in the "Assigned PPP DLL Protocol Numbers" list in the most recent "Assigned Numbers" RFC (RFC 1700 or later). The most recent "Assigned PPP DLL Protocol Numbers" can also be found using the URL = ftp://ftp.isi.edu/in-notes/iana/assignments/ppp-numbers.

The PDP Address shall be the address that this PDP context of the MS is identified with from the external packet data network.

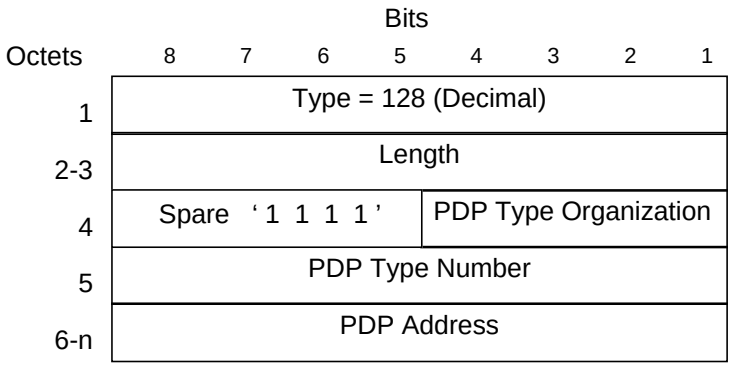


Figure 35: End User Address Information Element

Table 44: PDP Type Organisation Values

PDP Type Organisation	Value (Decimal)
ETSI	0
IETF	1
All other values are reserved	

Table 45: ETSI defined PDP Type Values

PDP Type Number	Value (Decimal)
PPP	1
~~OSP:IHOSS~~	~~2~~
All other values are reserved	

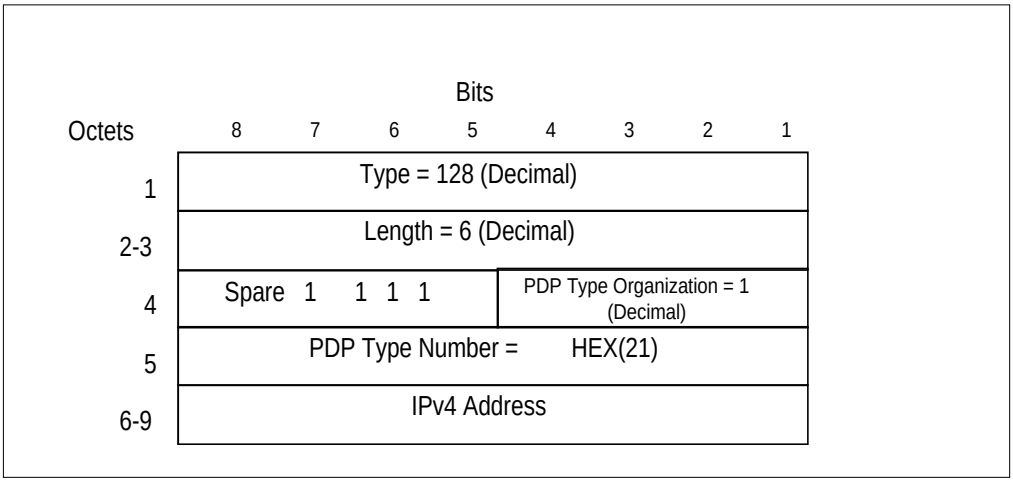


Figure 36: End User Address Information Element for IPv4

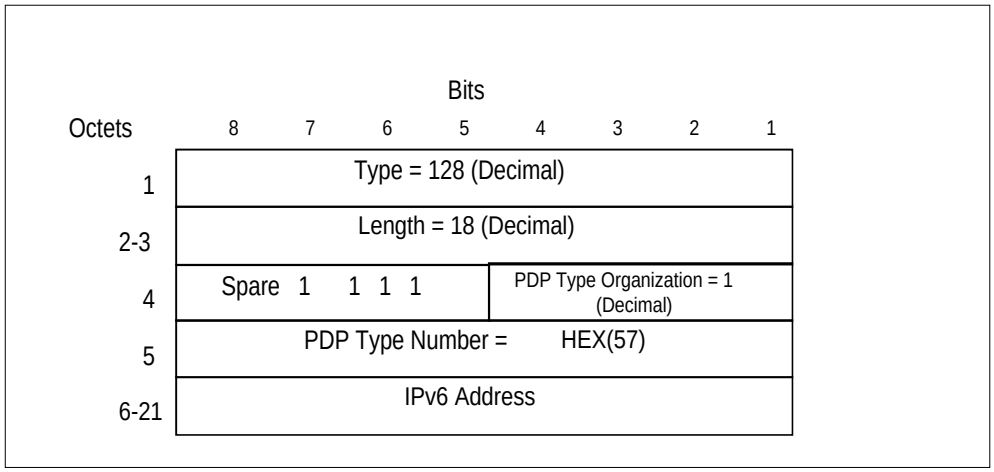


Figure 37: End User Address Information Element for IPv6

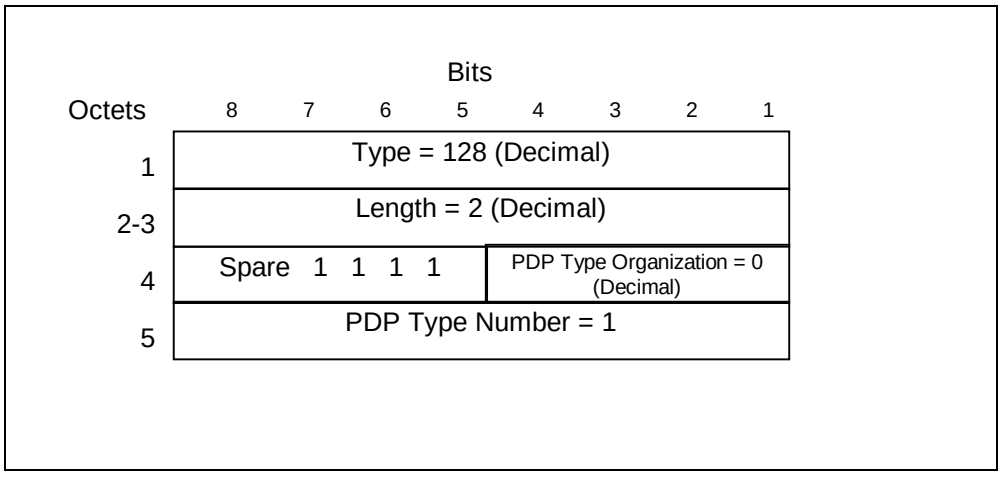
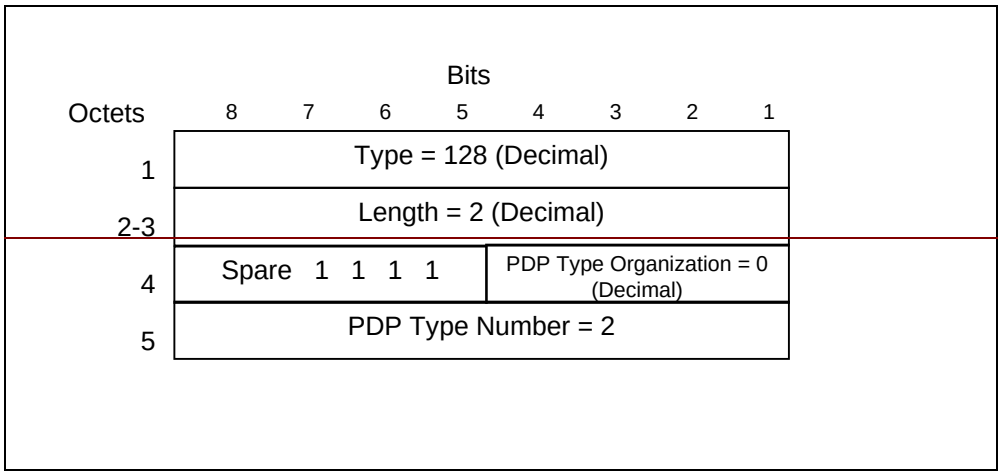


Figure 38: End User Address Information Element for PPP



~~Figure 39: End User Address Information Element for OSP: IHOSS~~

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Document N4-000590

CHANGE REQUEST

29.060	CR	135	Current Version:	3.5.0

For submission to:	CN#09	for approval	X	strategic	
		for information		non-strategic	X

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 [ ] UTRAN / Radio [ ] Core Network [X]
(at least one should be marked with an X)

Source: N4 **Date:** 24th July 2000

Subject: Addition of MS Not Reachable Reason to Send Routing Information For GPRS Response

Work item: GPRS

Category:

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release	X		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: To align 29.060 with 29.002 and 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:

7.4.2 Send Routeing Information for GPRS Response

The GTP-MAP protocol-converting GSN sends a Send Routeing Information for GPRS Response message as a response to the Send Routeing Information for GPRS Request message to the GGSN that sent the request.
The Cause value indicates if the GTP-MAP protocol-converting GSN accepted the request or not.
Possible Cause values are:

- 'Request Accepted'.
- 'No resources available'.
- 'Service not supported'.
- 'System failure'.
- 'Mandatory IE incorrect'.
- 'Mandatory IE missing'.
- 'Optional IE incorrect'.
- 'Invalid message format'.
- 'Version not supported'.

The MAP Cause information element contains the MAP error code ~~cause value~~received from the HLR and shall not be included if the Cause contains another value than 'Request accepted'.
The GSN Address information element contains the IP address of the SGSN and shall not be included if the Cause contains another value than 'Request accepted'.
It is an implementation issue what to do if the Cause or MAP Cause indicates that no location information is available.
The MS not Reachable Reason information element indicates the reason for the setting of the Mobile station Not Reachable for GPRS (MNRG) flag and shall not be included if the Cause contains another value than 'Request accepted'.
The optional Private Extension contains vendor or operator specific information.

Table 19: Information Elements in a Send Routeing Information for GPRS Response

Information element	Presence requirement	Reference
Cause	Mandatory	7.7.1
IMSI	Mandatory	7.7.2
MAP Cause	Optional	7.7.8
GSN Address	Optional	7.7.32
MS not Reachable Reason	Optional	7.7.25A
Private Extension	Optional	7.7.44

.....

7.4.4 Failure Report Response

The GTP-MAP protocol-converting GSN sends a Failure Report Response message as a response to the Failure Report Request message to the GGSN that sent the request.
The Cause value indicates if the GTP-MAP protocol-converting GSN accepted the request or not.
Possible Cause values are:

- 'Request Accepted'.
- 'No resources available'.

- ‘Service not supported’.
- ‘System failure’.
- ‘Mandatory IE incorrect’.
- ‘Mandatory IE missing’.
- ‘Optional IE incorrect’.
- ‘Invalid message format’.
- ‘Version not supported’.

The MAP Cause information element contains the MAP error code~~cause value~~ received from the HLR and shall not be included if the Cause contains another value than ‘Request accepted’.
It is an implementation issue what to do if the Cause or MAP Cause indicates that the HLR has not received the request or rejected the request.
The optional Private Extension contains vendor or operator specific information.

Table 21: Information Elements in a Failure Report Response

Information element	Presence requirement	Reference
Cause	Mandatory	7.7.1
MAP Cause	Optional	7.7.8
Private Extension	Optional	7.7.44

7.7 Information Elements

A control plane message may contain several information elements. The TLV (Type, Length, Value) or TV (Type, Value) encoding format shall be used for the GTP information elements. The information elements shall be sorted, with the Type fields in ascending order, in the control plane messages. The Length field contains the length of the information element excluding the Type and Length field.
For all the length fields, bit 8 of the lowest numbered octet is the most significant bit and bit 1 of the highest numbered octet is the least significant bit.
Within information elements, certain fields may be described as spare. These bits shall be transmitted with the value defined for them. To allow for future features, the receiver shall not evaluate these bits.
The most significant bit in the Type field is set to 0 when the TV format is used and set to 1 for the TLV format.

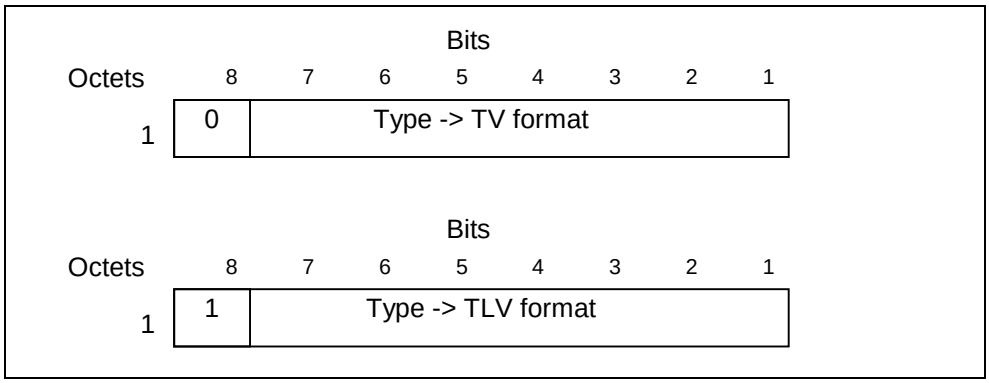

Figure 8: Type field for TV and TLV format

Table 37: Information Elements

IE Type Value	Format	Information Element	Reference
1	TV	Cause	7.7.1
2	"	International Mobile Subscriber Identity (IMSI)	7.7.2
3	"	Routeing Area Identity (RAI)	7.7.3
4	"	Temporary Logical Link Identity (TLLI)	7.7.4
5	"	Packet TMSI (P-TMSI)	7.7.5
6-7	Spare		
8	"	Reordering Required	7.7.6
9	"	Authentication Triplet	7.7.7
10	Spare		
11	"	MAP Cause	7.7.8
12	"	P-TMSI Signature	7.7.9
13	"	MS Validated	7.7.10
14	"	Recovery	7.7.11
15	"	Selection Mode	7.7.12
16	"	Tunnel Endpoint Identifier Data I	7.7.13
17	"	Tunnel Endpoint Identifier Control Plane	7.7.14
18	"	Tunnel Endpoint Identifier Data II	7.7.15
19	"	Teardown Ind	7.7.16
20	"	NSAPI	7.7.17
21	"	RANAP Cause	7.7.18
22	"	RAB Context	7.7.19
23	"	Radio Priority SMS	7.7.20
24	"	Radio Priority	7.7.21
25	"	Packet Flow Id	7.7.22
26	"	Charging Characteristics	7.7.23
27	"	Trace Reference	7.7.24
28	"	Trace Type	7.7.25
29	"	MS Not Reachable Reason	7.7.25A
117-126	Reserved for the GPRS charging protocol (see GTP' in GSM 12.15)		
127	"	Charging ID	7.7.26
128	TLV	End User Address	7.7.27
129	"	MM Context	7.7.28
130	"	PDP Context	7.7.29
131	"	Access Point Name	7.7.30
132	"	Protocol Configuration Options	7.7.31
133	"	GSN Address	7.7.32
134	"	MS International PSTN/ISDN Number (MSISDN)	7.7.33
135	"	Quality of Service Profile	7.7.34
136	"	Authentication Quintuplet	7.7.35
137	"	Traffic Flow Template	7.7.36
138	"	Target Identification	7.7.37
139	"	UTRAN Transparent Container	7.7.38
140	"	Target RNC Information	7.7.39
141	"	Extension Header Type List	7.7.40
142	"	Trigger Id	7.7.41
143	"	OMC Identity	7.7.42
239-250	Reserved for the GPRS charging protocol (see GTP' in GSM 12.15)		
251	"	Charging Gateway Address	7.7.43
252-254	Reserved for the GPRS charging protocol (see GTP' in GSM 12.15)		
255	"	Private Extension	7.7.44

.....

7.7.25A MS Not Reachable Reason

The MS Not Reachable Reason indicates the reason for the setting of the MNRG flag.

Octets	Bits 8	7	6	5	4	3	2	1
1	Type = 29 (Decimal)							
2	Reason for Absence							

Reason for Absence is defined in TS 3G 23.040

Figure 33A: MS Not Reachable Reason Information Element

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Seattle, 28th August - 1st September 2000

Document N4-000774
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.

29.060	CR	138r1	Current Version:	3.5.0

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

For submission to:	CN#09	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

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		UTRAN / Radio		Core Network	X

Source: N4 **Date:** 10.August.2000

Subject: Coding of TI in PDP Context IE

Work item: GPRS

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

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release	X		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:

The PDP context IE contains the TI (transaction Identifier) to use for communication with the MS. No definition is given how the used TI is inserted into the PDP context IE; is the TI stored in the PDP context as sent from SGSN to the MS, or as received from the MS? Therefore the receiving SGSN in case of an Inter SGSN change might not use the TI properly.

Proposal: Define, how the TI is to be coded in the PDP Context IE.

Clauses affected: 7.7.29

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.

7.7.29 PDP Context

The PDP Context information element contains the Session Management parameters, defined for an external packet data network address, that are necessary to transfer between SGSNs at the Inter SGSN Routeing Area Update procedure.

NSAPI is an integer value in the range [0; 15].

The NSAPI points out the affected PDP context.

The SAPI indicates the LLC SAPI that is associated with the NSAPI.

The Transaction Identifier is the 4 or 12 bit Transaction Identifier used in the 3G TS 24.008 Session Management messages which control this PDP Context. If the length of the Transaction Identifier is 4 bit, the second octet shall be set to all zeros. The encoding is defined in 3G TS 24.007. The latest Transaction Identifier sent from SGSN to MS is stored in the PDP context IE.

Reordering Required (Order) indicates whether the SGSN shall reorder T-PDUs before delivering the T-PDUs to the MS. When the Quality of Service Negotiated (QoS Neg) is Release 99, the Reordering Required (Order) shall be ignored by receiving entity.

The VPLMN Address Allowed (VAA) indicates whether the MS is allowed to use the APN in the domain of the HPLMN only or additionally the APN in the domain of the VPLMN.

The QoS Sub Length, QoS Req Length and QoS Neg Length represent respectively the lengths of the QoS Sub, QoS Req and QoS Neg fields, excluding the QoS Length octet.

The Quality of Service Subscribed (QoS Sub), Quality of Service Requested (QoS Req) and Quality of Service Negotiated (QoS Neg) are encoded as described in section ‘Quality of Service (QoS) Profile’. Their minimum length is 4 octets; their maximum length may be 255 octets.

The Sequence Number Down is the number of the next T-PDU that shall be sent from the new SGSN to the MS. The number is associated to the Sequence Number from the GTP Header of an encapsulated T-PDU.

The Sequence Number Up is the number that new SGSN shall use as the Sequence Number in the GTP Header for the next encapsulated T-PDU from the MS to the GGSN.

The Send N-PDU Number is used only when acknowledged peer-to-peer LLC operation is used for the PDP context. Send N-PDU Number is the N-PDU number to be assigned by SNDCP to the next down link N-PDU received from the GGSN. It shall be set to 255 if unacknowledged peer-to-peer LLC operation is used for the PDP context.

The Receive N-PDU Number is used only when acknowledged peer-to-peer LLC operation is used for the PDP context. The Receive N-PDU Number is the N-PDU number expected by SNDCP from the next up link N-PDU to be received from the MS. It shall be set to 255 if unacknowledged peer-to-peer LLC operation is used for the PDP context.

The Up link Tunnel Endpoint Identifier Control Plane is the Tunnel Endpoint Identifier used between the old SGSN and the GGSN in up link direction for control plane purpose. It shall be used by the new SGSN within the GTP header of the Update PDP Context Request message.

The PDP Context Identifier is used to identify a PDP context for the subscriber.

The PDP Type Organisation and PDP Type Number are encoded as in the End User Address information element.

The PDP Address Length represents the length of the PDP Address field, excluding the PDP Address Length octet.

The PDP Address is an octet array with a format dependent on the PDP Type. The PDP Address is encoded as in the End User Address information element if the PDP Type is IPv4 or IPv6.

The GGSN Address Length represents the length of the GGSN Address field, excluding the GGSN Address Length octet.

The old SGSN includes the GGSN Address for control plane that it has received from GGSN at PDP context activation or update.

The APN is the Access Point Name in use in the old SGSN. I.e. the APN sent in the Create PDP Context request message.

The spare bits x indicate unused bits that shall be set to 0 by the sending side and which shall not be evaluated by the receiving side.

1	Type = 130 (Decimal)				
2-3	Length				
4	Res-erved	VAA	Res-erved	Order	NSAPI
5	X	X	X	X	SAPI
6	QoS Sub Length				
7 - (q+6)	QoS Sub [4..255]				
q+7	QoS Req Length				
(q+8)-(2q+7)	QoS Req [4..255]				
2q+8	QoS Neg. Length				
(2q+9)-(3q+8)	QoS Neg [4..255]				
(3q+9)-(3q+10)	Sequence Number Down (SND) [1)]				
(3q+11)-(3q+12)	Sequence Number Up (SNU) [1)]				
3q+13	Send N-PDU Number [1)]				
3q+14	Receive N-PDU Number [1)]				
(3q+15)-(3q+18)	Uplink Tunnel Endpoint Identifier Control Plane				
3q+19	PDP Context Identifier				
3q+20	Spare 1 1 1 1				PDP Type Organisation
3q+21	PDP Type Number				
3q+22	PDP Address Length				
(3q+23)-m	PDP Address [1..63]				
m+1	GGSN Address for control plane Length				
(m+2)-n	GGSN Address for control plane [4..16]				
n+1	APN length				
(n+2)-o	APN				
o+1	Spare (sent as 0 0 0 0)				Transaction Identifier
o+2	Transaction Identifier				

Figure 43: PDP Context Information Element

1) This field shall not be evaluated when the PDP context is received during UMTS intra system handover/relocation.

Table 48: Reordering Required Values

Reordering Required	Value (Decimal)
No	0
Yes	1

Table 49: VPLMN Address Allowed Values

VPLMN Address Allowed	Value (Decimal)
No	0
Yes	1

3GPP TSG-CN-WG4 meeting #4
Seattle, USA, 28 August - 1 September 2000

Document N4-000733
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.

29.060	CR	141r2	Current Version:	3.5.0

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

For submission to:	CN#09	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

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		UTRAN / Radio	X	Core Network	X

Source: N4 **Date:** 24th Aug 2000

Subject: Categorise Error indication as the GTP-U message

Work item: GPRS

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:
Because of the Error indication message is dedicatedly designed to treat malfunctioning of the G-PDU message delivery between GSNs. In that sense, it is natural to define this message as the U plane message. In practical, once miss delivery is detected in GSN, it's hard to find the appropriate destination C-plane address of the remote node that to be returned to and also what is the proper C-plane address in a node to sent from. Besides, If the Error indication message is just returned back to the message initiator, the address information in the IP header area could be a useful data to find the problem for the message initiator. Moreover, this treatment is pretty same concept as the ICMP (Internet Control Message Protocol) mechanism in the IP layer.
From the message receiver's point of view, source address, destination address and TEID in the original message are the important useful data to be delivered. The GSN address data can be obtained form the IP header area. The TEID that was in the original message header could be an only information to be delivered.

Clauses affected: 7.1, 7.3.7, 8.2, 9.3.1

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.

7 GTP Messages and Message Formats

7.1 Message Formats

GTP defines a set of messages between two associated GSNs or an SGSN and an RNC. The messages to be used are defined in the table below. The three columns to the right define which parts (GTP-C, GTP-U or GTP') that send or receive the specific message type.

Table 1: Signalling Messages in GTP

Message Type value (Decimal)	Message	Reference	GTP-C	GTP-U	GTP'
0	For future use. Shall not be sent. If received, shall be treated as an Unknown message.				
1	Echo Request	7.2.1	X	X	
2	Echo Response	7.2.2	X	X	
3	Version Not Supported	7.2.3	X	X	
4	Node Alive Request	GSM 12.15			X
5	Node Alive Response	GSM 12.15			X
6	Redirection Request	GSM 12.15			X
7	Redirection Response	GSM 12.15			X
8-15	For future use. Shall not be sent. If received, shall be treated as an Unknown message.				
16	Create PDP Context Request	7.3.1	X		
17	Create PDP Context Response	7.3.2	X		
18	Update PDP Context Request	7.3.3	X		
19	Update PDP Context Response	7.3.4	X		
20	Delete PDP Context Request	7.3.5	X		
21	Delete PDP Context Response	7.3.6	X		
22-25	For future use. Shall not be sent. If received, shall be treated as an Unknown message.				
26	Error Indication	7.3.7		X	
27	PDU Notification Request	7.3.8	X		
28	PDU Notification Response	7.3.9	X		
29	PDU Notification Reject Request	7.3.10	X		
30	PDU Notification Reject Response	7.3.11	X		
31	Supported Extension Headers Notification	7.2.4	X	X	
32	Send Routeing Information for GPRS Request	7.4.1	X		
33	Send Routeing Information for GPRS Response	7.4.2	X		
34	Failure Report Request	7.4.3	X		
35	Failure Report Response	7.4.4	X		
36	Note MS GPRS Present Request	7.4.5	X		
37	Note MS GPRS Present Response	7.4.6	X		
38-47	For future use. Shall not be sent. If received, shall be treated as an Unknown message.				
48	Identification Request	7.5.1	X		
49	Identification Response	7.5.2	X		
50	SGSN Context Request	7.5.3	X		
51	SGSN Context Response	7.5.4	X		
52	SGSN Context Acknowledge	7.5.5	X		
53	Forward Relocation Request	7.5.6	X		
54	Forward Relocation Response	7.5.7	X		
55	Forward Relocation Complete	7.5.8	X		
56	Relocation Cancel Request	7.5.9	X		
57	Relocation Cancel Response	7.5.10	X		
58	Forward SRNS Context	7.5.11	X		
59	Forward Relocation Complete Acknowledge	7.5.x	X		
60	Forward SRNS Context Acknowledge	7.5.x	X		
61-239	For future use. Shall not be sent. If received, shall be treated as an Unknown message.				
240	Data Record Transfer Request	GSM 12.15			X
241	Data Record Transfer Response	GSM 12.15			X
242-254	For future use. Shall not be sent. If received, shall be treated as an Unknown message.				
255	T-PDU	9.3.1		X	

7.3.7 Error Indication

A GSN/RNC shall send an Error Indication to the other GSN or RNC if no active PDP context exists for a received G-PDU.

The GSN shall delete its PDP context and the GSN/RNC may notify the Operation and Maintenance network element when an Error Indication is received.

The SGSN shall indicate to the MS when a PDP context has been deleted due to the reception of an Error Indication message. The MS may then request the re-establishment of the PDP context.

The information elements Tunnel Endpoint Identifier Data I shall be the TEID fetched from the G-PDU that triggered this procedure.

The optional Private Extension contains vendor or operator specific information.

Table 13: Information Elements in an Error Indication

Information element	Presence requirement	Reference
Tunnel Endpoint Identifier Data I	Mandatory	7.7.13
Private Extension	Optional	7.7.44

8.2 Usage of the GTP-C Header

For control plane messages the GTP header shall be used as follows:

- Version shall be set to decimal 1 (‘001’).
- Protocol Type (PT) shall be set to ‘1’.
- (S) shall be set to ‘1’.
- PN shall be set to ‘0’. A GTP-C receiver shall ignore this flag.
- Message Type shall be set to the unique value that is used for each type of control plane message. Valid message types are marked with an x in the GTP-C column in Table 1.
- Length shall be the length, in octets, of the control plane message excluding the GTP header.
- The Tunnel Endpoint Identifier is set by the sending entity to the value requested by the corresponding entity (SGSN or GGSN); it identifies the MS and its associated context data, except for the following cases:
  - The Create PDP Context Request message for a given MS sent to a specific GGSN shall have the Tunnel Endpoint Identifier set to all zeros, if the SGSN has not been assigned a Tunnel Endpoint Identifier for Signalling by the GGSN.
  - The Identification Request/Response messages, where the Tunnel Endpoint Identifier shall be set to all zeros.
  - The SGSN Context Request message, where the Tunnel Endpoint Identifier shall be set to all zeros.
  - The Echo Request/Response, Supported Extension Headers notification and the Version Not Supported messages, where the Tunnel Endpoint Identifier shall be set to all zeros.
  - The Forward Relocation Request message, where the Tunnel Endpoint Identifier shall be set to all zeros.
  - The PDU Notification Request message, where the Tunnel Endpoint Identifier shall be set to all zeros, except for the case where the GGSN has already been assigned a Tunnel Endpoint Identifier for Signalling by the peer SGSN.

- The Relocation Cancel Request message where the Tunnel Endpoint Identifier shall be set to all zeros, except for the case where the old SGSN has already been assigned the Tunnel Endpoint Identifier Signalling of the new SGSN.

- All Location Management messages, where the Tunnel Endpoint Identifier shall be set to all zeros.

- Sequence Number shall be a message number valid for a path. Within a given set of contiguous Sequence Numbers from 0 to 65535, a given Sequence Number shall, if used, unambiguously define a GTP control plane request message sent on the path (see section Reliable delivery of control plane messages). The Sequence Number in a control plane response message shall be copied from the control plane request message that the GSN is replying to.

- N-PDU Number shall not be interpreted.

The GTP-C header may be followed by subsequent information elements dependent on the type of control plane message. Only one information element of each type is allowed in a single control plane message, except for the Authentication Triplet, the PDP Context and the Tunnel Endpoint Identifier for Data (II) information element where several occurrences of each type are allowed.

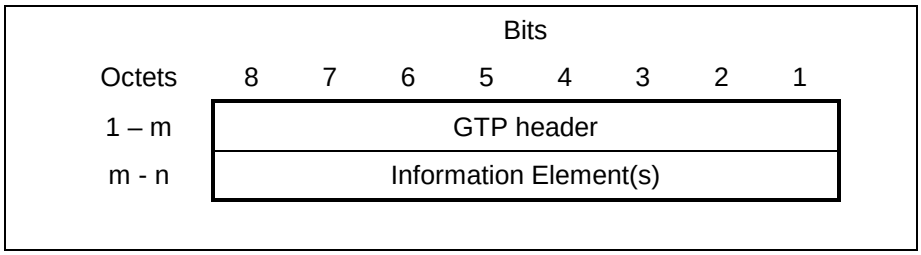

Figure 61: GTP Header followed by subsequent Information Elements

9.3.1 Usage of the GTP-U Header

The GTP-U header shall be used as follows:

- Version shall be set to decimal 1 (‘001’).

- Protocol Type (PT) shall be set to '1’.

- If the S field is set to '1' the sequence number field is present otherwise it is set to '0'.

- PN flag: the GTP-U header includes the N-PDU Number field if the PN flag is set to 1.

- Message Type shall be set according to Table 1. The value 255 is used when T-PDUs are transmitted. The value 1 and 2 are used for "Echo" messages. The value 3 is used for "Version Non Supported" messages. The value 26 is used for “Error Indication” message.

- Length: Size of the T-PDU excluding the GTP-U header size.

- Sequence Number: This field is present only if the S field is set to 1. The handling of this field is specified in subclause 9.1.1. It shall be used in order to decide whether or not to discard a received T-PDU, as specified in sub-clause 9.3.1.1 Usage of the Sequence Number.

- N-PDU Number: This field shall be included if and only if the PN flag is set to 1. In this case, the old SGSN (or RNC) uses it, at the Inter SGSN Routeing Area Update procedure (or SRNS relocation), to inform the new SGSN (or RNC) of the N-PDU number assigned to T-PDU. If an N-PDU number was not assigned to the T-PDU by PDCP, or if the T-PDU is to be transferred using unacknowledged peer-to-peer LLC operation, then PN shall be set to 0.

- TEID: Contains the Tunnel Endpoint Identifier for the tunnel to which this T-PDU belongs. The TEID shall be used by the receiving entity to find the PDP context, except for the following cases:

- The Echo Request/Response, Supported Extension Headers notification and the Version Not Supported messages, where the Tunnel Endpoint Identifier shall be set to all zeroes.

- The Error Indication message where the Tunnel Endpoint Identifier shall be set to all zeros.