

3GPP TSG CN Plenary Meeting #18
4th – 6th December 2002 New Orleans, USA.

NP-020576

Source: TSG CN WG4
Title: GPRS corrections for Release 4 & earlier
Agenda item: 7.3
Document for: APPROVAL

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
09.60	A117		N4-021147	R97	Removing inconsistency in definition of PDP Address length	F	6.12.0
09.60	A118		N4-021148	R98	Removing inconsistency in definition of PDP Address length	A	7.9.0
29.060	358	1	N4-021301	R99	PDCP sequence numbers in SGSN Context Response	F	3.14.0
29.060	359	1	N4-021302	Rel-4	PDCP sequence numbers in SGSN Context Response	A	4.5.0
29.060	360	1	N4-021303	Rel-5	PDCP sequence numbers in SGSN Context Response	A	5.3.0
29.060	361		N4-021152	R99	Correction of incomplete implementation of CR 29.060-203r1	F	3.14.0

3GPP TSG CN WG4 Meeting #16
 Miami, USA, 23rd – 27th September 2002

N4-021147

CR-Form-v7	
CHANGE REQUEST	
⌘ 09.60 CR A117 ⌘ rev - ⌘	Current version: 6.12.0 ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Removing inconsistency in definition of PDP Address length		
Source:	⌘ CN4		
Work item code:	⌘ GPRS	Date:	⌘ 16/09/2002
Category:	⌘ F	Release:	⌘ R97
	Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)

Reason for change:	⌘ This is an essential correction.
	There is an inconsistency in 09.60 in the definition of the length of the PDP Address. In chapter 7.9.20 the length of the 'pure' PDP Address is defined as [1..63]. I.e. even if no PDP Address shall be provided, this IE cannot be empty. In the same chapter a reference is given to chapter 7.9.18, where the same Address is correctly defined and can be of length 0.
Summary of change:	⌘ 7.9.20: Change length of PDP Address to [0..63].
Consequences if not approved:	⌘ The inconsistent definition will lead to different implementations and to interoperability problems.

Clauses affected:	⌘ 7.9.20						
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;">Y</td> <td style="text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> Other core specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	⌘	
Y	N						
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table> Test specifications	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
<input checked="" type="checkbox"/>	<input type="checkbox"/>						
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table> O&M Specifications	<input checked="" type="checkbox"/>	<input type="checkbox"/>				
<input checked="" type="checkbox"/>	<input type="checkbox"/>						
Other comments:	⌘						

**** **FOR INFORMATION** ****

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.

If the PDP Type Organization is ETSI, the PDP Type Number is 0 meaning X.25 and a PDP Address in the X.121 format.

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.

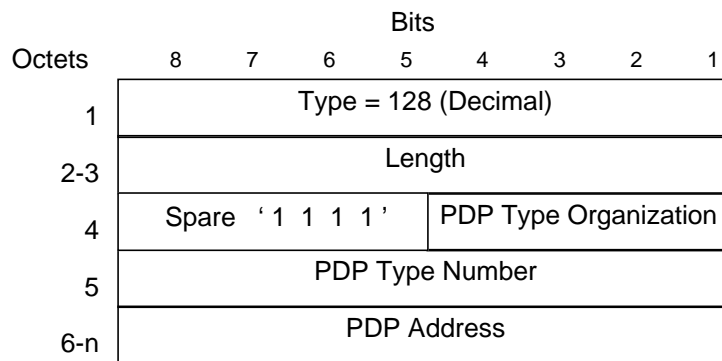


Figure 25: End User Address information element

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
All other values are reserved	

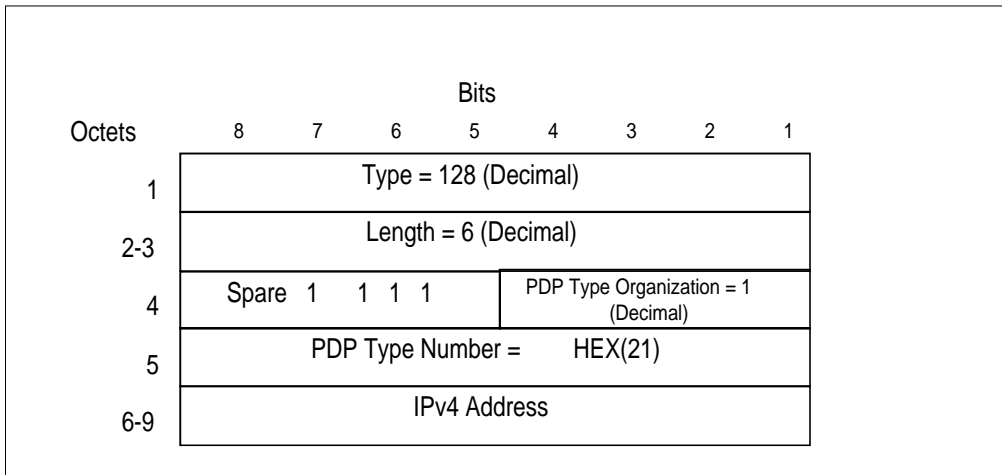


Figure 26: End User Address information element for IPv4

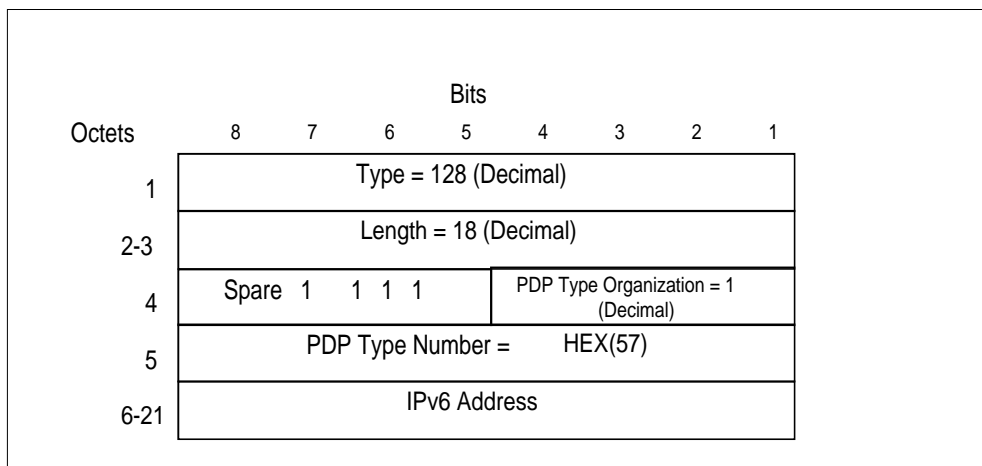
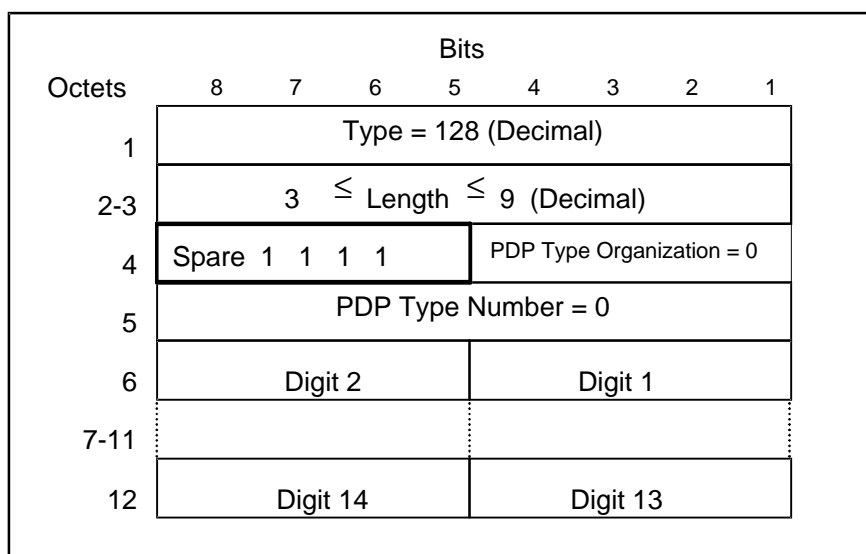


Figure 27: End User Address information element for IPv6



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

**** FOR INFORMATION ****

**** START OF MODIFICATION ****

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 Routing 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.

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 Access Point Name in use in the old SGSN. This APN field shall be composed of the APN Network Identifier part and the APN Operator Identifier part.

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- rved	AA	Res- rved	rder	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 [04..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 30: PDP Context information element

Table 38: Reordering Required values

Reordering Required	Value (Decimal)
No	0
Yes	1

Table 39: VPLMN Address Allowed

VPLMN Address Allowed	Value (Decimal)
No	0
Yes	1

**** END OF MODIFICATION ****

3GPP TSG CN WG4 Meeting #16
 Miami, USA, 23rd – 27th September 2002

N4-021148

CR-Form-v7
CHANGE REQUEST
⌘ 09.60 CR A118 ⌘ rev - ⌘ Current version: 7.9.0 ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘	Removing inconsistency in definition of PDP Address length		
Source:	⌘	CN4		
Work item code:	⌘	GPRS	Date:	⌘ 16/09/2002
Category:	⌘	A	Release:	⌘ R98
		Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)

Reason for change:	⌘	There is an inconsistency in 09.60 in the definition of the length of the PDP Address. In chapter 7.9.20 the length of the 'pure' PDP Address is defined as [1..63]. I.e. even if no PDP Address shall be provided, this IE cannot be empty. In the same chapter a reference is given to chapter 7.9.18, where the same Address is correctly defined and can be of length 0.		
Summary of change:	⌘	7.9.20: Change length of PDP Address to [0..63].		
Consequences if not approved:	⌘	The inconsistent definition will lead to different implementations and to interoperability problems.		

Clauses affected:	⌘	7.9.20										
Other specs affected:	⌘	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">N</td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px; text-align: center;">X</td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px; text-align: center;">X</td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px; text-align: center;">X</td> </tr> </table>	Y	N		X		X		X	Other core specifications	⌘
		Y	N									
			X									
	X											
	X											
	X	Test specifications										
	X	O&M Specifications										
Other comments:	⌘											

**** **FOR INFORMATION** ****

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. 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.

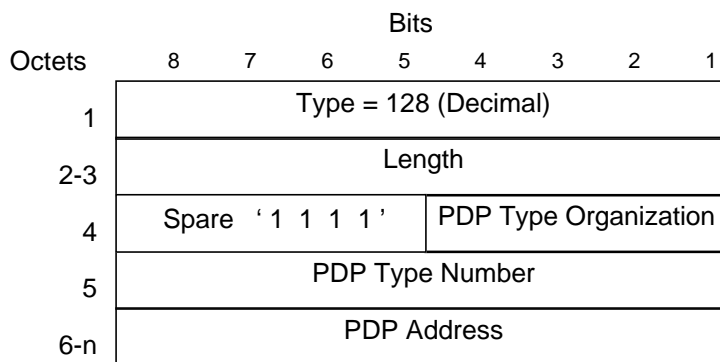


Figure 25: End User Address information element

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
All other values are reserved	

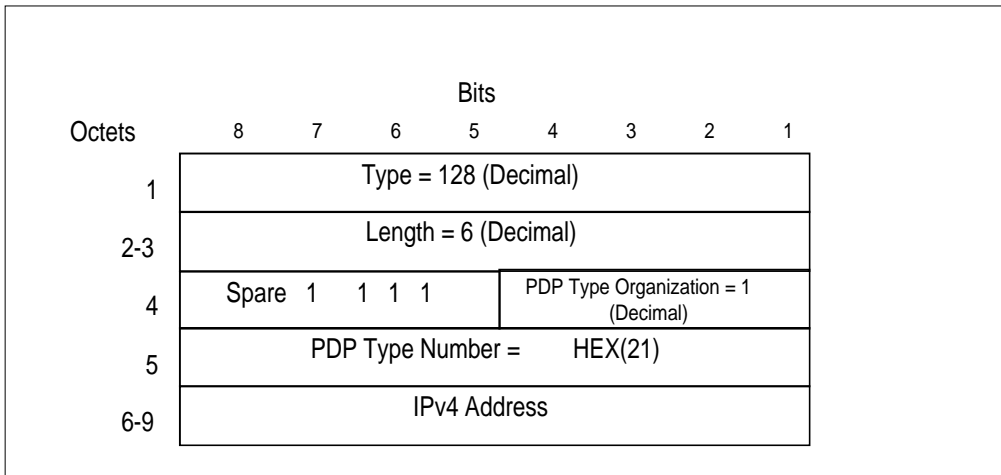


Figure 26: End User Address information element for IPv4

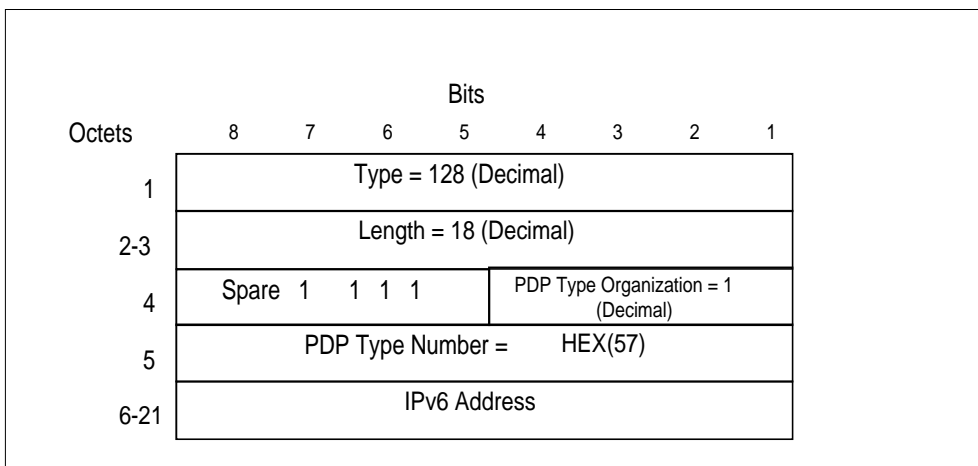
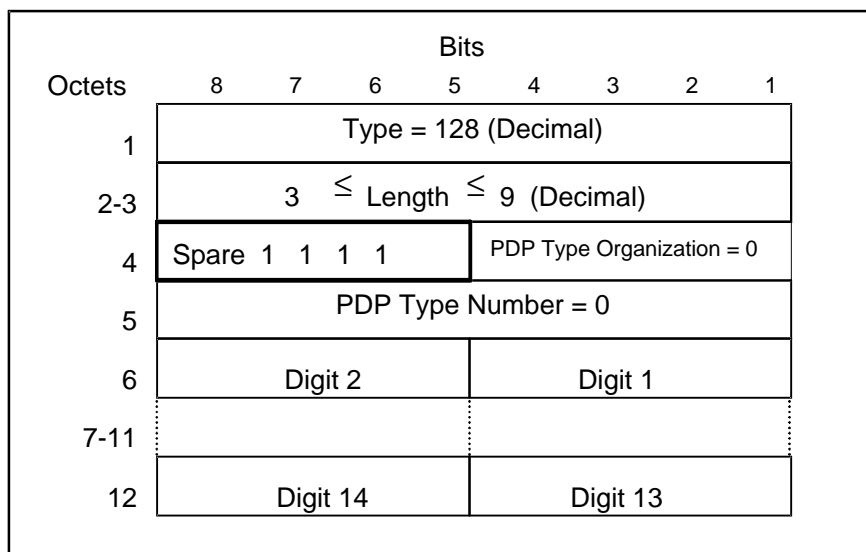


Figure 27: End User Address information element for IPv6



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

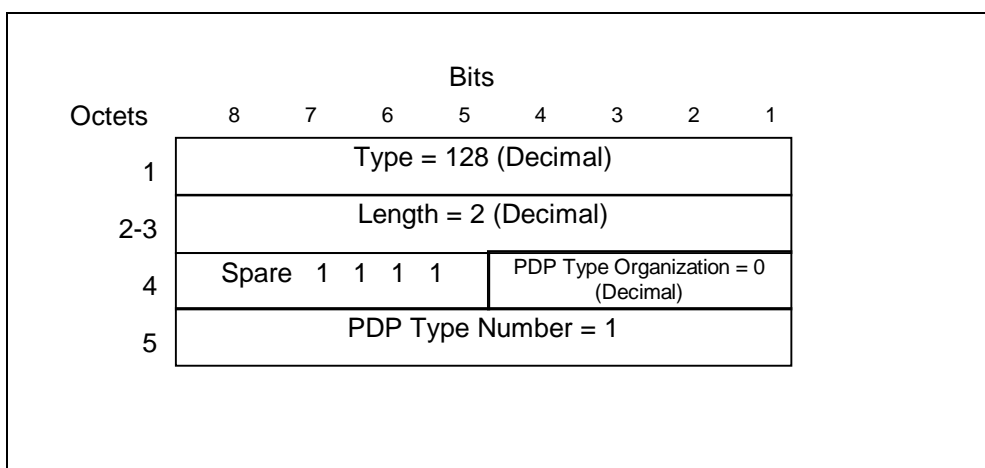


Figure 29: End User Address information element for PPP

**** FOR INFORMATION ****

**** START OF MODIFICATION ****

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 Routing 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 Access Point Name in use in the old SGSN. This APN field shall be composed of the APN Network Identifier part and the APN Operator Identifier part.

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- rved	AA	Res- rved	rder	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 [04..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

**** END OF MODIFICATION ****

3GPP TSG CN WG4 Meeting #16
Miami, USA, 23rd – 27th September 2002

N4-021301

CR-Form-v7	
CHANGE REQUEST	
⌘ 29.060 CR 358 ⌘ rev 1 ⌘	Current version: 3.14.0 ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ PDCP sequence numbers in SGSN Context Response		
Source:	⌘ CN4		
Work item code:	⌘ GPRS	Date:	⌘ 26/09/2002
Category:	⌘ F	Release:	⌘ R99
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	2	(GSM Phase 2)
	A (corresponds to a correction in an earlier release)	R96	(Release 1996)
	B (addition of feature),	R97	(Release 1997)
	C (functional modification of feature)	R98	(Release 1998)
	D (editorial modification)	R99	(Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

Reason for change:	⌘ This is an essential correction.
	In some Inter-SGSN RA Update scenarios it is necessary for the old SGSN to transport the PDCP sequence numbers via the SGSN Context Response to the new SGSN. This is the case for an UMTS Inter-SGSN RA Update after Cell/URA Update failure. Currently all necessary sequence numbers for lossless PDP-Contexts are transported in the PDP Context IE inside the SGSN Context Response message. Unfortunately the PDP Context IE only offers one octet for the transport of N-PDU sequence numbers (SNDP), but the PDCP sequence numbers, which are used in UMTS need 2 octets. Therefore we suggest to add the RAB Context IE as an optional parameter in the SGSN Context Response message. This parameter shall be inserted if PDCP sequence numbers must be forwarded in the SGSN Context Response.
Summary of change:	⌘ 7.5.4: Insert the RAB Context in the SGSN Context Response
Consequences if not approved:	⌘ UMTS Inter-SGSN RA Update after Cell/URA Update failure will not work.

Clauses affected:	⌘						
Other specs affected:	<table border="1" style="font-size: x-small;"> <tr> <td style="width: 20px;">Y</td> <td style="width: 20px;">N</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> </table>	Y	N	⌘	X	Other core specifications	⌘
	Y	N					
	⌘	X					
⌘	X	Test specifications					
	⌘	X	O&M Specifications				
Other comments:	⌘						

**** START OF MODIFICATION ****

7.5.4 SGSN Context Response

The old SGSN shall send an SGSN Context Response to the new SGSN as a response to a previous SGSN Context Request.

Possible Cause values are:

- 'Request Accepted'.
- 'IMSI not known'.
- 'System failure'.
- 'Mandatory IE incorrect'.
- 'Mandatory IE missing'.
- 'Optional IE incorrect'.
- 'Invalid message format'.
- 'P-TMSI Signature mismatch'.

If the Cause contains the value 'Request accepted', all information elements are mandatory, except PDP Context, RAB Context and Private Extension.

If the Cause contains the value 'P-TMSI Signature mismatch' the IMSI information element shall be included in the response, otherwise only the Cause information element shall be included in the response.

The old SGSN shall include a SGSN Address for control plane. The new SGSN shall store this SGSN Address and use it when sending control plane messages for the MS to the old SGSN in the SGSN context transfer procedure.

The Tunnel Endpoint Identifier Control Plane field specifies a Tunnel Endpoint Identifier, which is chosen by the old SGSN. The new SGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent control plane messages, which are sent from the new SGSN to the old SGSN and related to the PDP context(s) requested.

The IMSI information element contains the IMSI matching the TLLI or P-TMSI (for GSM or UMTS respectively) and RAI in the SGSN Context Request.

The MM Context contains necessary mobility management and security parameters.

All active PDP contexts in the old SGSN shall be included as PDP Context information elements.

If there is at least one active PDP context, the old SGSN shall start the T3-TUNNEL timer and store the address of the new SGSN in the "New SGSN Address" field of the MM context. The old SGSN shall wait for SGSN Context Acknowledge before sending T-PDUs to the new SGSN. If the old SGSN has one or more active PDP contexts for the subscriber and an SGSN Context Acknowledge message is not received within a time defined by T3-RESPONSE, the old SGSN shall retransmit the SGSN Context Response to the new SGSN as long as the total number of attempts is less than N3-REQUESTS. After N3-REQUESTS unsuccessfully attempts, the old SGSN shall proceed as described in section 'Reliable delivery of signalling messages' in case the transmission of a control plane message fails N3-REQUESTS times.

For each RAB using lossless PDCP context, the old SGSN shall include a RAB Context. If a RAB Context is included in the SGSN Context Response, the new SGSN shall ignore the PDCP and GTP-U sequence numbers received in the PDP Context.

Radio Priority SMS contains the radio priority level for MO SMS transmission, and shall be included if a valid Radio Priority SMS value exists for the MS in the old SGSN.

Radio Priority is the radio priority level that the MS uses when accessing the network for the transmission of uplink user data for a particular PDP context. One Radio Priority IE shall be included per PDP context that has a valid radio priority value assigned to it in the old SGSN.

Packet Flow Id is the packet flow identifier assigned to the PDP context. One Packet Flow Id IE shall be included per PDP context that has a valid packet flow identifier value assigned to it in the old SGSN.

The optional Private Extension contains vendor or operator specific information.

Table 27: Information Elements in a SGSN Context Response

Information element	Presence requirement	Reference
Cause	Mandatory	7.7.1
IMSI	Conditional	7.7.2
Tunnel Endpoint Identifier Control Plane	Conditional	7.7.14
RAB Context	Conditional	7.7.19
Radio Priority SMS	Optional	7.7.20
Radio Priority	Optional	7.7.21
Packet Flow Id	Optional	7.7.22
MM Context	Conditional	7.7.28
PDP Context	Conditional	7.7.29
SGSN Address for Control Plane	Conditional	7.7.32
Private Extension	Optional	7.7.44

**** END OF MODIFICATION ****

**** START OF MODIFICATION ****

7.5.6 Forward Relocation Request

The old SGSN shall send a Forward Relocation Request to the new SGSN to convey necessary information to perform the SRNS Relocation procedure between new SGSN and Target RNC.

All information elements are mandatory, except PDP Context, RAB Context and Private Extension.

The IMSI information element contains the IMSI of the target MS for SRNS Relocation procedure.

The old SGSN shall include a SGSN Address for control plane. The new SGSN shall store this SGSN Address and use it when sending control plane messages for the MS to the old SGSN in the SRNS Relocation procedure.

The Tunnel Endpoint Identifier Control Plane field specifies a tunnel endpoint identifier, which is chosen by the old SGSN. The new SGSN shall include this Tunnel Endpoint Identifier Control Plane in the GTP header of all subsequent control plane messages, which are sent from the new SGSN to the old SGSN.

The MM Context contains necessary mobility management and security parameters.

All active PDP contexts in the old SGSN shall be included as PDP Context information elements. In case no PDP context is active, this IE shall not be included.

For each RAB using lossless PDCP context, the old SGSN shall include a RAB Context. If a RAB Context is included in the Forward Relocation Request, the new SGSN shall ignore the PDCP and GTP-U sequence numbers received in the PDP Context.

UTRAN transparent container, Target identification and RANAP Cause are information from the source RNC in the old SGSN.

The optional Private Extension contains vendor or operator specific information.

Table 29: Information Elements in a Forward Relocation

Information element	Presence requirement	Reference
IMSI	Mandatory	7.7.2
Tunnel Endpoint Identifier Control Plane	Mandatory	7.7.14
RANAP Cause	Mandatory	7.7.18
RAB Context	Conditional	7.7.19
MM Context	Mandatory	7.7.28
PDP Context	Conditional	7.7.29
SGSN Address for Control plane	Mandatory	7.7.32
Target Identification	Mandatory	7.7.37
UTRAN transparent container	Mandatory	7.7.38
Private Extension	Optional	7.7.44

****** END OF MODIFICATION ******

****** FOR INFORMATION ******

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 3GPP 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 3GPP 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 new SGSN shall ignore Sequence Number Down when the PDP context QoS profile does not require transmission order to be preserved. In this case the new SGSN shall not include Sequence number field in the G-PDUs of the PDP context.

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 new SGSN shall ignore Sequence Number Up when the PDP context QoS profile does not require transmission order to be preserved. In this case, the old SGSN shall not include Sequence number field in the G-PDUs of the PDP context.

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 Uplink 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 GGSN Address for User Traffic and the Uplink Tunnel Endpoint Identifier Data I are the GGSN address and the Tunnel Endpoint Identifier used between the old SGSN and the GGSN in uplink direction for user plane traffic on a PDP context. They shall be used by the new SGSN to send uplink user plane PDU to the GGSN

The PDP Context Identifier is used to identify a PDP context for the subscriber. The SGSN shall set the value of PDP Context Identifier to binary (1111 1111) if after inter-SGSN RAU using GTPv0 the new SGSN is not able to assign a correct PDP Context Identifier to the existing PDP contexts.

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. This APN field shall be composed of the APN Network Identifier part and the APN Operator Identifier part.

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- erve d	Ord er	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)- (3q+22)	Uplink Tunnel Endpoint Identifier Data I				
3q+23	PDP Context Identifier				
3q+24	Spare 1 1 1 1			PDP Type Organisation	
3q+25	PDP Type Number				
3q+26	PDP Address Length				
(3q+27)-m	PDP Address [0..63]				
m+1	GGSN Address for control plane Length				
(m+2)-n	GGSN Address for control plane [4..16]				
n+1	GGSN Address for User Traffic Length				
(n+2)-o	GGSN Address for User Traffic [4..16]				
o+1	APN length				
(o+2)-p	APN				
p+1	Spare (sent as 0 0 0 0)			Transaction Identifier	
p+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

VPLMN Address Allowed	Value (Decimal)
No	0
Yes	1

**** FOR INFORMATION ****

3GPP TSG CN WG4 Meeting #16
Miami, USA, 23rd – 27th September 2002

N4-021302

CR-Form-v7	
CHANGE REQUEST	
⌘ 29.060 CR 359 ⌘ rev 1 ⌘	Current version: 4.5.0 ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘	PDCP sequence numbers in SGSN Context Response		
Source:	⌘	CN4		
Work item code:	⌘	GPRS	Date:	⌘ 26/09/2002
Category:	⌘	A	Release:	⌘ Rel-4
		Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
		F (correction)		2 (GSM Phase 2)
		A (corresponds to a correction in an earlier release)		R96 (Release 1996)
		B (addition of feature),		R97 (Release 1997)
		C (functional modification of feature)		R98 (Release 1998)
		D (editorial modification)		R99 (Release 1999)
		Detailed explanations of the above categories can be found in 3GPP TR 21.900.		Rel-4 (Release 4)
				Rel-5 (Release 5)
				Rel-6 (Release 6)

Reason for change:	⌘	<p>In some Inter-SGSN RA Update scenarios it is necessary for the old SGSN to transport the PDCP sequence numbers via the SGSN Context Response to the new SGSN. This is the case for an UMTS Inter-SGSN RA Update after Cell/URA Update failure.</p> <p>Currently all necessary sequence numbers for lossless PDP-Contexts are transported in the PDP Context IE inside the SGSN Context Response message. Unfortunately the PDP Context IE only offers one octet for the transport of N-PDU sequence numbers (SNDP), but the PDCP sequence numbers, which are used in UMTS need 2 octets.</p> <p>Therefore we suggest to add the RAB Context IE as an optional parameter in the SGSN Context Response message. This parameter shall be inserted if PDCP sequence numbers must be forwarded in the SGSN Context Response.</p>	
Summary of change:	⌘	7.5.4: Insert the RAB Context in the SGSN Context Response	
Consequences if not approved:	⌘	UMTS Inter-SGSN RA Update after Cell/URA Update failure will not work.	

Clauses affected:	⌘							
Other specs affected:	⌘	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;">Y</td> <td style="text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications	⌘
		Y	N					
		<input type="checkbox"/>	<input checked="" type="checkbox"/>					
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Test specifications						
<input type="checkbox"/>	<input checked="" type="checkbox"/>	O&M Specifications						
Other comments:	⌘							

****** START OF MODIFICATION ******

7.5.4 SGSN Context Response

The old SGSN shall send an SGSN Context Response to the new SGSN as a response to a previous SGSN Context Request.

Possible Cause values are:

- 'Request Accepted'.
- 'IMSI not known'.
- 'System failure'.
- 'Mandatory IE incorrect'.
- 'Mandatory IE missing'.
- 'Optional IE incorrect'.
- 'Invalid message format'.
- 'P-TMSI Signature mismatch'.

If the Cause contains the value 'Request accepted', all information elements are mandatory, except PDP Context, RAB Context and Private Extension.

If the Cause contains the value 'P-TMSI Signature mismatch' the IMSI information element shall be included in the response, otherwise only the Cause information element shall be included in the response.

The old SGSN shall include a SGSN Address for control plane. The new SGSN shall store this SGSN Address and use it when sending control plane messages for the MS to the old SGSN in the SGSN context transfer procedure.

The Tunnel Endpoint Identifier Control Plane field specifies a Tunnel Endpoint Identifier, which is chosen by the old SGSN. The new SGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent control plane messages, which are sent from the new SGSN to the old SGSN and related to the PDP context(s) requested.

The IMSI information element contains the IMSI matching the TLLI or P-TMSI (for GSM or UMTS respectively) and RAI in the SGSN Context Request.

The MM Context contains necessary mobility management and security parameters.

All active PDP contexts in the old SGSN shall be included as PDP Context information elements.

If there is at least one active PDP context, the old SGSN shall start the T3-TUNNEL timer and store the address of the new SGSN in the "New SGSN Address" field of the MM context. The old SGSN shall wait for SGSN Context Acknowledge before sending T-PDUs to the new SGSN. If the old SGSN has one or more active PDP contexts for the subscriber and an SGSN Context Acknowledge message is not received within a time defined by T3-RESPONSE, the old SGSN shall retransmit the SGSN Context Response to the new SGSN as long as the total number of attempts is less than N3-REQUESTS. After N3-REQUESTS unsuccessfully attempts, the old SGSN shall proceed as described in section 'Reliable delivery of signalling messages' in case the transmission of a control plane message fails N3-REQUESTS times.

For each RAB using lossless PDCP context, the old SGSN shall include a RAB Context. If a RAB Context is included in the SGSN Context Response, the new SGSN shall ignore the PDCP and GTP-U sequence numbers received in the PDP Context.

Radio Priority SMS contains the radio priority level for MO SMS transmission, and shall be included if a valid Radio Priority SMS value exists for the MS in the old SGSN.

Radio Priority is the radio priority level that the MS uses when accessing the network for the transmission of uplink user data for a particular PDP context. One Radio Priority IE shall be included per PDP context that has a valid radio priority value assigned to it in the old SGSN.

Packet Flow Id is the packet flow identifier assigned to the PDP context. One Packet Flow Id IE shall be included per PDP context that has a valid packet flow identifier value assigned to it in the old SGSN.

The optional Private Extension contains vendor or operator specific information.

Table 27: Information Elements in a SGSN Context Response

Information element	Presence requirement	Reference
Cause	Mandatory	7.7.1
IMSI	Conditional	7.7.2
Tunnel Endpoint Identifier Control Plane	Conditional	7.7.14
RAB Context	Conditional	7.7.19
Radio Priority SMS	Optional	7.7.20
Radio Priority	Optional	7.7.21
Packet Flow Id	Optional	7.7.22
MM Context	Conditional	7.7.28
PDP Context	Conditional	7.7.29
SGSN Address for Control Plane	Conditional	7.7.32
Private Extension	Optional	7.7.44

**** **END OF MODIFICATION** ****

**** **START OF MODIFICATION** ****

7.5.6 Forward Relocation Request

The old SGSN shall send a Forward Relocation Request to the new SGSN to convey necessary information to perform the SRNS Relocation procedure between new SGSN and Target RNC.

All information elements are mandatory, except PDP Context, RAB Context and Private Extension.

The IMSI information element contains the IMSI of the target MS for SRNS Relocation procedure.

The old SGSN shall include a SGSN Address for control plane. The new SGSN shall store this SGSN Address and use it when sending control plane messages for the MS to the old SGSN in the SRNS Relocation procedure.

The Tunnel Endpoint Identifier Control Plane field specifies a tunnel endpoint identifier, which is chosen by the old SGSN. The new SGSN shall include this Tunnel Endpoint Identifier Control Plane in the GTP header of all subsequent control plane messages, which are sent from the new SGSN to the old SGSN.

The MM Context contains necessary mobility management and security parameters.

All active PDP contexts in the old SGSN shall be included as PDP Context information elements. In case no PDP context is active, this IE shall not be included.

For each RAB using lossless PDCP context, the old SGSN shall include a RAB Context. If a RAB Context is included in the Forward Relocation Request, the new SGSN shall ignore the PDCP and GTP-U sequence numbers received in the PDP Context.

UTRAN transparent container, Target identification and RANAP Cause are information from the source RNC in the old SGSN.

The optional Private Extension contains vendor or operator specific information.

Table 29: Information Elements in a Forward Relocation

Information element	Presence requirement	Reference
IMSI	Mandatory	7.7.2
Tunnel Endpoint Identifier Control Plane	Mandatory	7.7.14
RANAP Cause	Mandatory	7.7.18
RAB Context	Conditional	7.7.19
MM Context	Mandatory	7.7.28
PDP Context	Conditional	7.7.29
SGSN Address for Control plane	Mandatory	7.7.32
Target Identification	Mandatory	7.7.37
UTRAN transparent container	Mandatory	7.7.38
Private Extension	Optional	7.7.44

****** END OF MODIFICATION ******

****** FOR INFORMATION ******

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 3GPP 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 3GPP 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 new SGSN shall ignore Sequence Number Down when the PDP context QoS profile does not require transmission order to be preserved. In this case the new SGSN shall not include Sequence number field in the G-PDUs of the PDP context.

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 new SGSN shall ignore Sequence Number Up when the PDP context QoS profile does not require transmission order to be preserved. In this case, the old SGSN shall not include Sequence number field in the G-PDUs of the PDP context.

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 Uplink 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 GGSN Address for User Traffic and the Uplink Tunnel Endpoint Identifier Data I are the GGSN address and the Tunnel Endpoint Identifier used between the old SGSN and the GGSN in uplink direction for user plane traffic on a PDP context. They shall be used by the new SGSN to send uplink user plane PDU to the GGSN

The PDP Context Identifier is used to identify a PDP context for the subscriber. The SGSN shall set the value of PDP Context Identifier to binary (1111 1111) if after inter-SGSN RAU using GTPv0 the new SGSN is not able to assign a correct PDP Context Identifier to the existing PDP contexts.

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. This APN field shall be composed of the APN Network Identifier part and the APN Operator Identifier part.

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- erve d	Ord er	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)- (3q+22)	Uplink Tunnel Endpoint Identifier Data I				
3q+23	PDP Context Identifier				
3q+24	Spare 1 1 1 1			PDP Type Organisation	
3q+25	PDP Type Number				
3q+26	PDP Address Length				
(3q+27)-m	PDP Address [0..63]				
m+1	GGSN Address for control plane Length				
(m+2)-n	GGSN Address for control plane [4..16]				
n+1	GGSN Address for User Traffic Length				
(n+2)-o	GGSN Address for User Traffic [4..16]				
o+1	APN length				
(o+2)-p	APN				
p+1	Spare (sent as 0 0 0 0)			Transaction Identifier	
p+2	Transaction Identifier				

Figure 43: PDP Context Information Element

NOTE 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

VPLMN Address Allowed	Value (Decimal)
No	0
Yes	1

**** FOR INFORMATION ****

3GPP TSG CN WG4 Meeting #16
 Miami, USA, 23rd – 27th September 2002

N4-021303

CR-Form-v7	
CHANGE REQUEST	
⌘ 29.060 CR 360 ⌘ rev 1 ⌘	Current version: 5.3.0 ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘	PDCP sequence numbers in SGSN Context Response
Source:	⌘	CN4
Work item code:	⌘	GPRS
		Date: ⌘ 26/09/2002
Category:	⌘	A
		Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.
		Release: ⌘ Rel-5 Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)

Reason for change:	⌘	In some Inter-SGSN RA Update scenarios it is necessary for the old SGSN to transport the PDCP sequence numbers via the SGSN Context Response to the new SGSN. This is the case for an UMTS Inter-SGSN RA Update after Cell/URA Update failure. Currently all necessary sequence numbers for lossless PDP-Contexts are transported in the PDP Context IE inside the SGSN Context Response message. Unfortunately the PDP Context IE only offers one octet for the transport of N-PDU sequence numbers (SNDP), but the PDCP sequence numbers, which are used in UMTS need 2 octets. Therefore we suggest to add the RAB Context IE as an optional parameter in the SGSN Context Response message. This parameter shall be inserted if PDCP sequence numbers must be forwarded in the SGSN Context Response.
Summary of change:	⌘	7.5.4: Insert the RAB Context in the SGSN Context Response
Consequences if not approved:	⌘	UMTS Inter-SGSN RA Update after Cell/URA Update failure will not work.

Clauses affected:	⌘									
Other specs affected:	⌘	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> </table> Other core specifications ⌘ Test specifications ⌘ O&M Specifications ⌘	Y	N		X		X		X
Y	N									
	X									
	X									
	X									
Other comments:	⌘									

****** START OF MODIFICATION ******

7.5.4 SGSN Context Response

The old SGSN shall send an SGSN Context Response to the new SGSN as a response to a previous SGSN Context Request.

Possible Cause values are:

- 'Request Accepted'.
- 'IMSI not known'.
- 'System failure'.
- 'Mandatory IE incorrect'.
- 'Mandatory IE missing'.
- 'Optional IE incorrect'.
- 'Invalid message format'.
- 'P-TMSI Signature mismatch'.

If the Cause contains the value 'Request accepted', all information elements are mandatory, except PDP Context, RAB Context and Private Extension.

If the Cause contains the value 'P-TMSI Signature mismatch' the IMSI information element shall be included in the response, otherwise only the Cause information element shall be included in the response.

The old SGSN shall include a SGSN Address for control plane. The new SGSN shall store this SGSN Address and use it when sending control plane messages for the MS to the old SGSN in the SGSN context transfer procedure.

The Tunnel Endpoint Identifier Control Plane field specifies a Tunnel Endpoint Identifier, which is chosen by the old SGSN. The new SGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent control plane messages, which are sent from the new SGSN to the old SGSN and related to the PDP context(s) requested.

The IMSI information element contains the IMSI matching the TLLI or P-TMSI (for GSM or UMTS respectively) and RAI in the SGSN Context Request.

The MM Context contains necessary mobility management and security parameters.

All active PDP contexts in the old SGSN shall be included as PDP Context information elements. The PDP contexts are included in an implementation dependant prioritized order, and the most important PDP context is placed first. When the PDP Context Prioritization IE is included, it informs the new SGSN that the PDP contexts are sent prioritized. If the new SGSN is not able to maintain active all the PDP contexts received from the old SGSN when it is indicated that prioritization of the PDP contexts is applied, the new SGSN should use the prioritisation sent by old SGSN as input when deciding which PDP contexts to maintain active and which ones to delete.

If there is at least one active PDP context, the old SGSN shall start the T3-TUNNEL timer and store the address of the new SGSN in the "New SGSN Address" field of the MM context. The old SGSN shall wait for SGSN Context Acknowledge before sending T-PDUs to the new SGSN. If the old SGSN has one or more active PDP contexts for the subscriber and an SGSN Context Acknowledge message is not received within a time defined by T3-RESPONSE, the old SGSN shall retransmit the SGSN Context Response to the new SGSN as long as the total number of attempts is less than N3-REQUESTS. After N3-REQUESTS unsuccessfully attempts, the old SGSN shall proceed as described in section 'Reliable delivery of signalling messages' in case the transmission of a control plane message fails N3-REQUESTS times.

For each RAB using lossless PDCP context, the old SGSN shall include a RAB Context. If a RAB Context is included in the SGSN Context Response, the new SGSN shall ignore the PDCP and GTP-U sequence numbers received in the PDP Context.

Radio Priority SMS contains the radio priority level for MO SMS transmission, and shall be included if a valid Radio Priority SMS value exists for the MS in the old SGSN.

Radio Priority LCS contains the radio priority level for MO LCS transmission, and shall be included if a valid Radio Priority LCS value exists for the MS in the old SGSN.

Radio Priority is the radio priority level that the MS uses when accessing the network for the transmission of uplink user data for a particular PDP context. One Radio Priority IE shall be included per PDP context that has a valid radio priority value assigned to it in the old SGSN.

Packet Flow Id is the packet flow identifier assigned to the PDP context. One Packet Flow Id IE shall be included per PDP context that has a valid packet flow identifier value assigned to it in the old SGSN.

The optional Private Extension contains vendor or operator specific information.

Table 27: Information Elements in a SGSN Context Response

Information element	Presence requirement	Reference
Cause	Mandatory	7.7.1
IMSI	Conditional	7.7.2
Tunnel Endpoint Identifier Control Plane	Conditional	7.7.14
RAB Context	Conditional	7.7.19
Radio Priority SMS	Optional	7.7.20
Radio Priority	Optional	7.7.21
Packet Flow Id	Optional	7.7.22
Radio Priority LCS	Optional	7.7.25B
MM Context	Conditional	7.7.28
PDP Context	Conditional	7.7.29
SGSN Address for Control Plane	Conditional	7.7.32
PDP Context Prioritization	Optional	7.7.45
Private Extension	Optional	7.7.46

**** END OF MODIFICATION ****

7.5.6 Forward Relocation Request

The old SGSN shall send a Forward Relocation Request to the new SGSN to convey necessary information to perform the SRNS Relocation procedure between new SGSN and Target RNC.

All information elements are mandatory, except PDP Context, RAB Context and Private Extension.

The IMSI information element contains the IMSI of the target MS for SRNS Relocation procedure.

The old SGSN shall include a SGSN Address for control plane. The new SGSN shall store this SGSN Address and use it when sending control plane messages for the MS to the old SGSN in the SRNS Relocation procedure.

The Tunnel Endpoint Identifier Control Plane field specifies a tunnel endpoint identifier, which is chosen by the old SGSN. The new SGSN shall include this Tunnel Endpoint Identifier Control Plane in the GTP header of all subsequent control plane messages, which are sent from the new SGSN to the old SGSN.

The MM Context contains necessary mobility management and security parameters.

All active PDP contexts in the old SGSN shall be included as PDP Context information elements. The PDP contexts are included in an implementation dependant prioritized order, and the most important PDP context is placed first. When the PDP Context Prioritization IE is included, it informs the new SGSN that the PDP contexts are sent prioritized. If the new SGSN is not able to maintain active all the PDP contexts received from the old SGSN when it is indicated that prioritization of the PDP contexts is applied, the new SGSN should use the prioritisation sent by old SGSN as input when deciding which PDP contexts to maintain active and which ones to delete. In case no PDP context is active, neither of these IEs shall be included.

For each RAB using lossless PDCP context, the old SGSN shall include a RAB Context. If a RAB Context is included in the Forward Relocation Request, the new SGSN shall ignore the PDCP and GTP-U sequence numbers received in the PDP Context.

UTRAN transparent container, Target identification and RANAP Cause are information from the source RNC in the old SGSN.

The optional Private Extension contains vendor or operator specific information.

Table 29: Information Elements in a Forward Relocation

Information element	Presence requirement	Reference
IMSI	Mandatory	7.7.2
Tunnel Endpoint Identifier Control Plane	Mandatory	7.7.14
RANAP Cause	Mandatory	7.7.18
<u>RAB Context</u>	<u>Conditional</u>	<u>7.7.19</u>
MM Context	Mandatory	7.7.28
PDP Context	Conditional	7.7.29
SGSN Address for Control plane	Mandatory	7.7.32
Target Identification	Mandatory	7.7.37
UTRAN transparent container	Mandatory	7.7.38
PDP Context Prioritization	Optional	7.7.45
Private Extension	Optional	7.7.46

****** START OF MODIFICATION ******

****** END OF MODIFICATION ******

****** FOR INFORMATION ******

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 3GPP 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 3GPP 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 new SGSN shall

ignore Sequence Number Down when the PDP context QoS profile does not require transmission order to be preserved. In this case the new SGSN shall not include Sequence number field in the G-PDUs of the PDP context.

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 new SGSN shall ignore Sequence Number Up when the PDP context QoS profile does not require transmission order to be preserved. In this case, the old SGSN shall not include Sequence number field in the G-PDUs of the PDP context.

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 Uplink 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 GGSN Address for User Traffic and the Uplink Tunnel Endpoint Identifier Data I are the GGSN address and the Tunnel Endpoint Identifier used between the old SGSN and the GGSN in uplink direction for user plane traffic on a PDP context. They shall be used by the new SGSN to send uplink user plane PDU to the GGSN until new GGSN address for User Traffic is possibly received from GGSN (in Update PDP Context Response).

The PDP Context Identifier is used to identify a PDP context for the subscriber. The SGSN shall set the value of PDP Context Identifier to binary (1111 1111) if after inter-SGSN RAU using GTPv0 the new SGSN is not able to assign a correct PDP Context Identifier to the existing PDP contexts.

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.

When forwarding the GGSN addresses to another SGSN (in PDP Context IE in Forward Relocation Request or SGSN Context Response message), the IPv4/IPv6 capable SGSN shall include GGSN addresses according to the IP version capability of the receiving SGSN.

The old SGSN includes the GGSN Address for control plane that it has received from GGSN at PDP context activation or update. If the new SGSN is IPv6 capable and the old SGSN has IPv6 control plane address of the GGSN available, the old IPv4/IPv6 capable SGSN includes the IPv6 GGSN control plane address in the field GGSN Address for control plane. If the new SGSN is IPv4 only capable or the old SGSN does not have any IPv6 GGSN address for control plane, the old SGSN includes the IPv4 GGSN Address in the field GGSN Address for control plane.

The use of IPv6 addressing in pre-Release 5 nodes can cause interoperability problems and as such the use of IPv6 GSN addressing is not recommended in pre-Release 5.

NOTE: There is still the need for further study of the included addresses on SRNS relocation.

The APN is the Access Point Name in use in the old SGSN. This APN field shall be composed of the APN Network Identifier part and the APN Operator Identifier part.

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- erve d	Ord er	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)- (3q+22)	Uplink Tunnel Endpoint Identifier Data I				
3q+23	PDP Context Identifier				
3q+24	Spare 1 1 1 1			PDP Type Organisation	
3q+25	PDP Type Number				
3q+26	PDP Address Length				
(3q+27)-m	PDP Address [0..63]				
m+1	GGSN Address for control plane Length				
(m+2)-n	GGSN Address for control plane [4..16]				
n+1	GGSN Address for User Traffic Length				
(n+2)-o	GGSN Address for User Traffic [4..16]				
o+1	APN length				
(o+2)-p	APN				
p+1	Spare (sent as 0 0 0 0)			Transaction Identifier	
p+2	Transaction Identifier				

Figure 43: PDP Context Information Element

NOTE 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

VPLMN Address Allowed	Value (Decimal)
No	0
Yes	1

**** FOR INFORMATION ****

CR-Form-v7

CHANGE REQUEST

⌘ **29.060 CR 361** ⌘ rev **-** ⌘ Current version: **3.14.0** ⌘

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

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘	Correction of incomplete impementation of CR 29.060-203r1	
Source:	⌘	CN4	
Work item code:	⌘	GPRS	Date: ⌘ 13/09/2002
Category:	⌘	F	Release: ⌘ R99
		Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .	Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)

Reason for change:	⌘	This is a correction to remedy the incorrect implementation of previously approved CR 29.060-203r1 (Tdoc N4-010712: Clarification of the handling of Version Not Supported; Supported Extension Headers and Error Indication messages). This CR was approved in CN4#8 and CN#12. This CR requested the inclusion of the new clauses 10.1.1.4 and 10.1.2.3. Clause 10.1.2.3 was not added in the new version of 29.060. The corresponding Rel-4 CR (220) was implemented correctly.
Summary of change:	⌘	Include 10.1.2.3
Consequences if not approved:	⌘	Incorrect specification.

Clauses affected:	⌘	10.1.2.3								
Other specs affected:	⌘	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 20px;">Y</td> <td style="width: 20px;">N</td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> <tr> <td style="text-align: center;">X</td> <td></td> </tr> </table> Other core specifications ⌘ Test specifications ⌘ O&M Specifications ⌘	Y	N	X		X		X	
Y	N									
X										
X										
X										
Other comments:	⌘									

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

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

- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

10.1.2.3 Error Indication, Version Not supported and Supported Extension Headers Notification

The IP source address shall be an address of the source GSN/RNC from which the message is originated. In particular, the source Address of the "Version Not Supported" or the "Supported Extension Headers Notification" message, shall be set to the destination address of the message that triggered the GSN/RNC to send the "Version Not Supported" or the "Supported Extension Headers Notification" message.

The IP destination address shall be the source address of the GTP-PDU that is the cause for the GSN/RNC to send one of these messages.