

3GPP TSG CN Plenary Meeting #16
5th – 7th June 2002 Marco Island, USA.

NP-020250

Source: TSG CN WG4
Title: CRs on Rel99 & earlier GPRS
Agenda item: 7.3
Document for: APPROVAL

Introduction:

This document contains 4 CRs on R99 & earlier Work Item "GTP Enhancement", that have been agreed by TSG CN WG4, and are forwarded to TSG CN Plenary meeting #16 for approval.

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
09.60	A111		N4-020591	R97	Addition of APN-OI to Inter-SGSN RAU	F	6.11.0
09.60	A112		N4-020592	R98	Addition of APN-OI to Inter-SGSN RAU	A	7.8.0
29.060	312		N4-020341	R99	Addition of APN-OI to Inter-SGSN RAU	A	3.12.0
29.060	313		N4-020328	R99	Correction on the handling of S field	F	3.12.0

CHANGE REQUEST

⌘ **09.60 CR A111** ⌘ rev **-** ⌘ Current version: **6.11.0** ⌘

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

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

Title:	⌘ Addition of APN-OI to Inter-SGSN RAU		
Source:	⌘ CN4		
Work item code:	⌘ GTP enhancements	Date:	⌘ 29 th April 2002
Category:	⌘ F (essential correction) 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:	⌘ R97 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)

Reason for change:	⌘ In 09.60, it is stated that only the APN NI is sent from the Source SGSN to the Target SGSN during IRAU. A new S-CDR is opened on the Target SGSN upon receipt of notification that an IRAU has been initiated, but the S-CDR does not include the APN OI field. Since this new S-CDR does not contain APN OI, it is rejected by the CGF because the APN OI field is mandatory in 12.15. Hence the CGF rejects all S-CDR's that are generated for new PDP Contexts after an IRAU.
Summary of change:	⌘ Add APN OI to the information transferred during Inter-SGSN RAU.
Consequences if not approved:	⌘ PDP Contexts transferred over an IRAU cannot be billed on the Target SGSN

Clauses affected:	⌘ 7.9.20		
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	
Other comments:	⌘		

How to create CRs using this form:

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

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

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.

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. ~~I.e. the APN sent in the Create PDP Context request message.~~ 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 [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 30: PDP Context information element

CHANGE REQUEST

⌘ **09.60 CR A112** ⌘ rev **-** ⌘ Current version: **7.8.0** ⌘

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

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

Title:	⌘ Addition of APN-OI to Inter-SGSN RAU		
Source:	⌘ CN4		
Work item code:	⌘ GTP enhancements	Date:	⌘ 29 th April 2002
Category:	⌘ A	Release:	⌘ R98
	<i>Use one of the following categories:</i> 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.		<i>Use one of the following releases:</i> 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change:	⌘ In 09.60, it is stated that only the APN NI is sent from the Source SGSN to the Target SGSN during IRAU. A new S-CDR is opened on the Target SGSN upon receipt of notification that an IRAU has been initiated, but the S-CDR does not include the APN OI field. Since this new S-CDR does not contain APN OI, it is rejected by the CGF because the APN OI field is mandatory in 12.15. Hence the CGF rejects all S-CDR's that are generated for new PDP Contexts after an IRAU.
Summary of change:	⌘ Add APN OI to the information transferred during Inter-SGSN RAU.
Consequences if not approved:	⌘ PDP Contexts transferred over an IRAU cannot be billed on the Target SGSN

Clauses affected:	⌘ 7.9.20		
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications ⌘ <input type="checkbox"/> Test specifications ⌘ <input type="checkbox"/> O&M Specifications		
Other comments:	⌘		

How to create CRs using this form:

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- 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.

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. ~~I.e. the APN sent in the Create PDP Context request message. 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 [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

CHANGE REQUEST

⌘ **29.060 CR 312** ⌘ rev **-** ⌘ Current version: **3.12.0** ⌘

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

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

Title:	⌘ Addition of APN-OI to Inter-SGSN RAU		
Source:	⌘ CN4		
Work item code:	⌘ GTP enhancements	Date:	⌘ 26 th March 2002
Category:	⌘ F (essential correction) 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:	⌘ R99 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)

Reason for change:	⌘ In 29.060, it is stated that only the APN NI is sent from the Source SGSN to the Target SGSN during IRAU. A new S-CDR is opened on the Target SGSN upon receipt of notification that an IRAU has been initiated, but the S-CDR does not include the APN OI field. Since this new S-CDR does not contain APN OI, it is rejected by the CGF because the APN OI field is mandatory in 32.015. Hence the CGF rejects all S-CDR's that are generated for new PDP Contexts after an IRAU. This problem is limited to R99 – at CN4 #10 (Brighton), CR255 was agreed against 29.060, to solve a different problem. However, the solution added the APN OI to the S-CDR and so the issue does not exist in R4. The R99 version of this CR was rejected however. This CR proposes the same changes as were proposed in CR254.
Summary of change:	⌘ Add APN OI to the information transferred during Inter-SGSN RAU.
Consequences if not approved:	⌘ PDP Contexts transferred over an IRAU cannot be billed on the Target SGSN

Clauses affected:	⌘ 7.7.29		
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications	⌘	
	<input type="checkbox"/> Test specifications		
	<input type="checkbox"/> O&M Specifications		
Other comments:	⌘		

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

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 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 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 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.~~ 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 [1..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.

CHANGE REQUEST

⌘ **29.060 CR 313** ⌘ rev **-** ⌘ Current version: **3.12.0** ⌘

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

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

Title:	⌘ Correction on the handling of S field		
Source:	⌘ CN4		
Work item code:	⌘ GPRS	Date:	⌘ 22/3/2002
Category:	⌘ F (Agreed by consensus) 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: ⌘ R99 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)

Reason for change:	⌘ There is an inconsistency between R99 and later releases in the definition on the handling of S field due to mis-implementation of a previously approved CR.
Summary of change:	⌘ The definition on the handling of S field in Error indication message was clarified.
Consequences if not approved:	⌘ Inconsistency between Rel99 and later releases and ambiguity of the presence of the sequence number field in Error indication message can lead to interworking problem.

Clauses affected:	⌘ 9.3.1	
Other specs affected:	⌘ <input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘
Other comments:	⌘	

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- 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.

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'. For GTP-U messages Echo Request, Echo Response Error Indication and Supported Extension Headers Notification, the S field shall be set to '1'.
- PN flag: the GTP-U header includes the N-PDU Number field if the PN flag is set to 1.