3GPP TSG_CN **Tdoc NP-000441**
Plenary Meeting #9, Oahu, Hawaii
20th – 22nd September 2000.

Source: **TSG_N WG 1**

Title: **CRs to R99 Work Item GPRS**

Agenda item: **8.13.1**

Document for: **APPROVAL**

Introduction:

This document contains 6 CRs on R99 Work Item X, that has been agreed by TSG_N WG1, and is forwarded to TSG_N Plenary meeting #9 for approval.

Spec	CR	Rev	Doc-2nd-	Phase	Subject	Cat	Ver_C	Ver_N
04.64	A143	1	N1-000987	R99	Corrections regarding NULL frame	F	8.4.0	8.5.0
04.65	A070	1	N1-001019	R99	Deletion of PDP type X.25	F	8.0.0	8.1.0
04.65	A071		N1-001025	R99	Supporting RFC2507 Header Compression in SNDCP	F	8.0.0	8.1.0
24.007	021		N1-000969	R99	Protocol Discriminator for DTM (simple class A)	F	3.4.0	3.5.0
29.016	004	1	N1-001017	R99	Different SSNs for SGSN and VLR	F	3.0.0	3.1.0
29.018	010		N1-000911	R99	Reject cause in case of expiry of T6-1	F	3.3.0	3.4.0

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Vancouver/Canada, 14-18 August 2000

Document N1-000911
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29.018	CR	010	Current Version:	3.3.0

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

For submission to:	CN#9	for approval	X	strategic		(for SMG use only)
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Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

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

Source: TSGN1 **Date:** 08.08.2000

Subject: Reject cause in case of expiry of T6-1

Work item: GPRS

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

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

Reason for change:

TS 29.018 specifies that if a combined routing area updating is unsuccessful for non-GPRS services, because the VLR does not answer and timer T6-1 expires in the SGSN, this will be indicated to the MS with the Reject cause value 'Service option temporarily out of order'.

This is not in line with TS 29.010, subclause 3.4, which specifies the cause value ‘MSC temporarily not reachable‘ for this case.

It is proposed to correct TS 29.018, because an MS receiving the cause value 'Service option temporarily out of order' will consider the combined routing area updating as failed for **both** GPRS **and** non-GPRS services:

According to TS 24.008, subclause 4.7.5.2.3.2, if the routing area updating was successful for GPRS services only, the SGSN will send a Routing Area Update Accept message containing one of the following reject causes:
#2 = IMSI unknown in HLR,
#16 = MSC temporarily not reachable,
#17 = Network failure, or
#22 = Congestion.

"Other values are considered as abnormal cases. The combined routing area updating shall be considered as failed for GPRS and non-GPRS services. The specification of the MS behaviour in those cases is specified in section 4.7.5.2.5."

Clauses affected: 6.2.4

Other specs affected:

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

Other comments:

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****** First Modified Section ******

6.2.4 Abnormal cases

If timer T6-1 expires, the SGSN shall abort the Location Update for non-GPRS service procedure and indicate this to the MS with the Reject cause value 'MSC temporarily not reachable'~~Service option temporarily out of order~~'. The state of the association to the VLR shall be Gs-NULL.

If the SGSN receives a BSSAP+LOCATION-UPDATE-ACCEPT message and timer T6-1 is not running then:

- If timer T8 is running (see clause 8), the message shall be ignored;
- If timer T9 is running (see clause 9), the message shall be ignored; or
- If timers T8 and T9 are not running:
  - If the state of the association to the VLR is GS-ASSOCIATED, the message shall be ignored; or
  - If the state of the association to the VLR is different than GS-ASSOCIATED, the message shall be treated as a message incompatible with the protocol state of the SGSN (see subclause 16.3).

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24.007	**CR**	**021**	Current Version:	3.4.0

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

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

Source: TSGN1 **Date:** 10/08/2000

Subject: Protocol Discriminator for DTM (simple class A)

Work item: GPRS

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

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

Reason for change: Recent work on DTM in SMG2 WPA (now 3GPP TSG GERAN WG2) changed the Protocol Discriminator of the messages used to send GMM/SM information on the main DCCH, from LLC to GTTP (GPRS Transparent Tunnelling Protocol). This CR reflects this change.

Clauses affected: 11.2.3.1.1

Other specs affected:

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

Other comments:

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11.2.3.1.1 Protocol discriminator

Bits 1 to 4 of the first octet of a standard L3 message contain the protocol discriminator (PD) information element. The PD identifies the L3 protocol to which the standard layer 3 message belongs. The correspondence between L3 protocols and PDs is one-to-one.

For future evolution an extension mechanism is foreseen which allows the use of protocol discriminators with one octet length, where bits 4 to one are coded as 1 1 1 0. Messages of such protocols may not be standard L3 messages. In particular, the rest of the header may not respect the structure described in this sub-clause.

The PD can take the following values:

Table 11.2: Protocol discriminator values

bits 4 3 2 1	
0 0 0 0	group call control
0 0 0 1	broadcast call control
0 0 1 0	PDSS1
0 0 1 1	call control; call related SS messages
0 1 0 0	~~LLC messages~~ GPRS Transparent Transport Protocol (GTTP)
0 1 0 1	mobility management messages
0 1 1 0	radio resources management messages
1 0 0 0	GPRS mobility management messages
1 0 0 1	SMS messages
1 0 1 0	GPRS session management messages
1 0 1 1	non call related SS messages
1 1 0 0	Location services
1 1 1 0	reserved for extension of the PD to one octet length
1 1 1 1	reserved for tests procedures described in GSM 11.10

If the network receives, on a SAP where it expects standard L3 messages, a message with a protocol discriminator different from those specified in table 11.2, the network may ignore the message or initiate the channel release procedure defined in GSM 04.08.

If the Mobile Station receives, on a SAP where it expects standard L3 messages, a standard L3 message with a protocol discriminator different from those specified in table 11.2, or for a protocol that it does not support, the Mobile Station shall ignore the message.

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N1-000987
Document revised N1-000870
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04.64	**CR**	**A143 r1**	Current Version:	8.4.0

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

For submission to: TSGN#9 *list expected approval meeting # here ↑*	for approval	X	strategic		*(for SMG use only)*
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Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio		Core Network	X

Source: TSGN1 **Date:** Aug. 14, 2000

Subject: Corrections regarding NULL frame

Work item: GPRS

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

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

Reason for change: N1 have agreed on CR A142r2 “Change of the Cell update procedure” where a new frame, NULL, is introduced in 04.64. However, to effectively integrate the NULL frame into 04.64, more sections need to be revised. This CR provides such revisions.

Clauses affected:

Other specs affected:

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

Other comments:


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6.4 Commands and responses

The following commands and responses are used by the MS and the SGSN LLEs and are represented in **Error! Reference source not found.**. Each logical link connection shall support the appropriate set of commands and responses for the type of operation desired (see clause 8).

Those frame types not identified in **Error! Reference source not found.**, **Error! Reference source not found.**, or **Error! Reference source not found.**, shall be identified as having undefined command and/or response control fields, and shall be treated as defined in subclause 8.8.2.

Table 1: Commands and responses

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

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

The commands and responses in **Error! Reference source not found.** are defined in the following subclauses.

**********NEXT MODIFICATION**********

6.4.1.7 NULL command

The NULL unnumbered command shall be used by an MS LLE ~~of the MS~~ to indicate a cell update. The NULL unnumbered command is only allowed if the Cell Notification is indicated by the ~~network~~ SGSN (see 3G TS 23.060 and 3G TS 24.008).

No information field is permitted with the NULL command.

**********NEXT MODIFICATION**********

7.2.1.3 LLGMM-TRIGGER

LLGMM-TRIGGER-REQ shall be used in the MS to order LLC to transmit any single frame. If there is a frame waiting to be transmitted in the MS, then this frame shall be transmitted. Otherwise if Cause indicates Cell Update and if Cell Notification is indicated by the SGSN (see 3G TS 24.008), then a NULL frame with P=0 shall be transmitted. Otherwise, and if the LLE is in ABM state, a supervisory frame shall be transmitted according to subclause 8.6.4.1~~.~~ ~~I~~or if the LLE is in ADM state a UI frame with no information field shall be transmitted. There is only need to transmit a frame on one SAPI. Which SAPI to choose is implementation dependent.

LLGMM-TRIGGER-REQ is normally used for cell updates or for page responses, and the reason shall be indicated in the Cause parameter. If Cause indicates page response, then the GRR-DATA-REQ Cause parameter shall also indicate page response.

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N1-001017
Document rev of N1-000910
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29.016	CR	004r1	Current Version:	3.0.0

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

For submission to:	CN#9	for approval	X	strategic		(for SMG use only)
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Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

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

Source: TSGN1 **Date:** 09.08.2000

Subject: Different SSNs for SGSN and VLR

Work item: GPRS

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

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

Reason for change:

According to TS 29.016, subclause 4, "The configuration of the Gs interface shall not impose any restriction on the number of VLRs or SGSNs to be connected by the Gs interface. The Gs interface definition shall support an early implementation of GPRS when one SGSN may be connected to several VLRs or a more mature implementation when several SGSNs may be connected to one VLR."

Furthermore, according to TS 23.121, subclause 4.1, "the UMTS standard shall allow for both separated and combined MSC/VLR and SGSN configurations".

If a combined MSC/VLR and SGSN is connected via a Gs interface to other VLRs (or SGSNs), the SCCP subsystem numbers for the VLR side and the SGSN side of the Gs interface need to be different. It is proposed to clarify in the standard that this is a possible configuration.

Clauses affected: 6.4.1, 6.4.2

Other specs affected:

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

Other comments:

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6 Conformance to SCCP

6.1 Overview

The purpose of this clause is to identify the subset of the SCCP functions which are necessary to provide addressing, error detection and segmentation facilities in the Gs interface. If this subset of SCCP functions is implemented, compatibility with a full ITU-T or ANSI SCCP shall be maintained. Only the needs of the user of SCCP (refer to GSM 09.18) are taken into account in this clause: the operations and maintenance requirements about SCCP functions are outside the scope of this technical specification.

No SCCP translation function is required in the VLR or the SGSN between the national and the local MTP. The Destination Point Code and Subsystem Number would allow direct routing by the local SCCP and MTP. Global Title addressing is supported on the Gs interface to provide flexibility in the addressing scheme implementation (note that the SGSN is assigned a global title in order to communicate with an HLR across an inter PLMN boundary).

Only connectionless class 0 SCCP services are used on the Gs interface. These simplifications are applicable to the signalling between an SGSN and a VLR in GSM PLMNs.

The minimum set of SCCP functions which apply are specified in the ITU-T Recommendations Q.711, Q.712, Q.713 and Q.714, for E1 interface and ANSI T1.112 for T1 interface with the qualifications specified in this Recommendation.

6.4 SCCP formats and codes

6.4.1 SCCP format and codes for E1 Interface (ITU Recommendation Q.713)

- Q.713 subclause 3.4
  - The called party address shall include the appropriate sub system number. All other aspects of SCCP addressing are network specific.
- Q.713 subclause 3.4.2.2
  - SSN value:
    - This is a national network concern. Different SSN values can be allocated for SGSN and VLR.
- Q.713 subclause 3.5
  - The calling party address shall include the appropriate sub system number. All other aspects of SCCP addressing are network specific. .
- Q.713 subclause 3.6
  - Protocol class: the classes 1, 2 and 3 are not used.
- Q.713 subclauses 3.7 3.8, 3.9, 3.10, 3.11, 3.13, 3.14, 3.15
  - Parameters not used
- Q.713 subclauses 4.2 to 4.9 and 4.12 to 4.17
  - Messages not used.
- Q.713 subclause 5.1.1
  - SOR and SOG not needed.

6.4.2 SCCP format and codes for T1 Interface (ANSI Standards T1.112.3)

T1.112.3 subclause 3.4

- The called party address shall include the appropriate sub system number. All other aspects of SCCP addressing are network specific.

T1.112.3 subclause 3.4.2.1

- The SSN values are~~is~~ a national network concern. Different SSN values can be allocated for SGSN and VLR.

T1.112.3 subclause 3.5

- The calling party address shall include the appropriate sub-system number. All other aspects of SCCP addressing are network specific.

T1.112.3 subclause 3.6

- Protocol class: the classes 2 and 3 are not used.

T1.112.3 subclauses 3.7, 3.8, 3.9, 3.10, 3.11, 3.13, 3.14, 3.15

- Parameters not used

T1.112.3 subclauses 4.2 to 4.9 and 4.12 to 4.17

- Messages not used.

T1.112.3 subclause 5.1.1

SOR, SNR, SRT, SBR, and SOG not needed.

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Document ***N1-001019***
Revised ***N1-000937***
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04.65	CR	A 070r1	Current Version:	8.0.0

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

For submission to: TSGN#9 *list expected approval meeting # here ↑*

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

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

Source: TSGN1 **Date:** Aug. ~~05~~16, 2000

Subject: Deletion of PDP type X.25

Work item: GPRS

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

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

Release:

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

Reason for change: PDP type X.25 has been agreed to be deleted from R99 specs. This CR provides the corresponding revisions to 04.65 ver. 8.0.0.

Clauses affected:

Other specs affected:

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

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3.2 Abbreviations

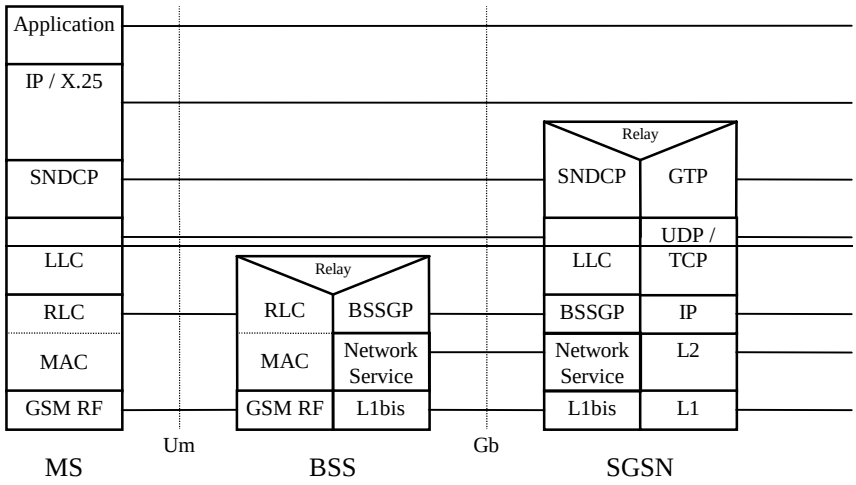
In addition to abbreviations in GSM 01.04 [1], GSM 02.60 [2], and GSM 03.60 [3], the following abbreviations apply:

DCOMP	Identifier of the user data compression algorithm used for the N-PDU
F	First segment indicator bit
GMM	GPRS Mobility Management
IP	Internet Protocol
LLC	Logical Link Control
M	More bit used to indicate the last segment of N-PDU
N-PDU	Network Protocol Data Unit
NSAPI	Network Layer Service Access Point Identifier
P	Propose bit
PCOMP	Identifier of the protocol control information compression algorithm used for the N-PDU
PDP	Packet Data Protocol e.g., IPv4 or ~~X.25~~IPv6
PDU	Protocol Data Unit
PTP	Point to Point
QoS	Quality of Service
SAPI	Service Access Point Identifier
SDU	Service Data Unit
SGSN	Serving GPRS Support Node
SM	Session Management
SNDCP	Subnetwork Dependent Convergence Protocol
SNSM	SNDCP-SM
TCP	Transmission Control Protocol
TLLI	Temporary Logical Link Identifier
X	Spare bit

**********NEXT MODIFICATION**********

4 General

The present document describes the functionality of the GPRS SNDCP. The overall GPRS logical architecture is defined in GSM 03.60 [3]. Location of the SNDCP in GPRS protocol stack can be seen in Figure 1.



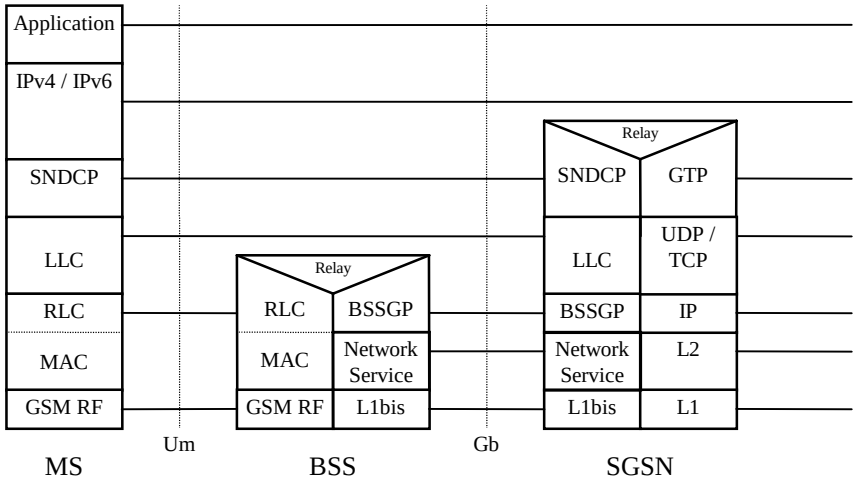


Figure 1: GPRS protocol stack

Network layer protocols are intended to be capable of operating over services derived from a wide variety of subnetworks and data links. GPRS supports several network layer protocols providing protocol transparency for the users of the service. Introduction of new network layer protocols to be transferred over GPRS shall be possible without any changes to GPRS. Therefore, all functions related to transfer of Network layer Protocol Data Units (N-PDUs) shall be carried out in a transparent way by the GPRS network entities. This is one of the requirements for GPRS SNDCP.

Another requirement for the SNDCP is to provide functions that help to improve channel efficiency. This requirement is fulfilled by means of compression techniques.

The set of protocol entities above SNDCP consists of commonly used network protocols. They all use the same SNDCP entity, which then performs multiplexing of data coming from different sources to be sent using the service provided by the LLC layer (Figure 2). The Network Service Access Point Identifier (NSAPI) is an index to the PDP context (see GSM 03.60 [3]) of the PDP that is using the services provided by SNDCP. One PDP may have several PDP contexts and NSAPIs. However, it is possible that each allocated NSAPI is used by separate PDP. Each active NSAPI shall use the services provided by the Service Access Point Identifier (SAPI) in the LLC layer. Several NSAPIs may be associated with the same SAPI.

Since the adaptation of different network layer protocols to SNDCP is implementation dependent, it is not defined in the present document.

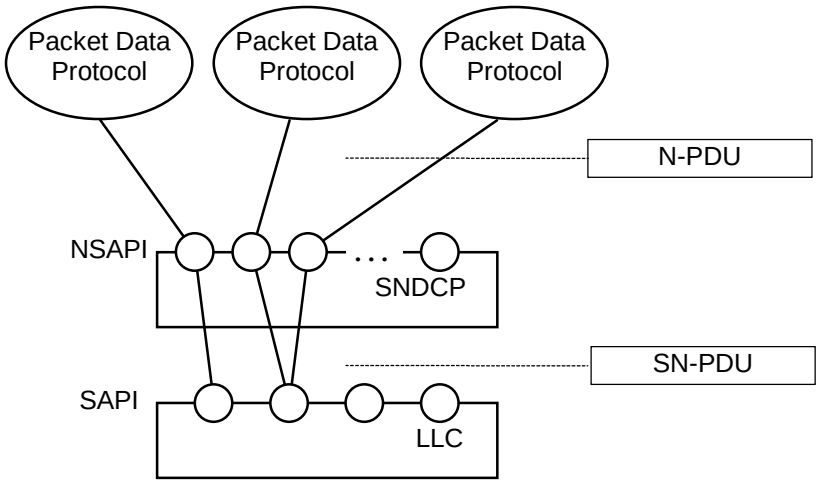


Figure 2: Example for multiplexing of different protocols

**********NEXT MODIFICATION**********

6.1 Multiplexing of N-PDUs

The NSAPI field shall be used for the identification of the specific PDP type and PDP address pair that is using the services provided by the SNDCP layer. The MS allocates NSAPIs dynamically at the PDP Context Activation. The NSAPI is delivered by the SM sub-layer to the SNDCP layer with the SNSM-ACTIVATE.indication primitive. The transmitting SNDCP entity shall insert the NSAPI value for each N-PDU. The peer SNDCP entity uses the NSAPI to identify the SNDCP user the N-PDU is targeted. Table 3 shows an example for the allocation of the NSAPIs.

Table 13: Example of the NSAPI allocation

PDP type	Allocated NSAPI	PDP address
IPv4	12	133.12.75.111 (4 octets)
X.25IPv6	13	13254133.12. … .11.123 (16 octets)

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***Document* N1-001025**
e.g. for 3GPP use the format TP-99xxx
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04.65	CR	A071r1	Current Version:	8.0.0

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

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

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

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

Source: TSGN1 **Date:** 17.8.2000

Subject: Supporting RFC2507 Header Compression in SNDCP

Work item: GPRS

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

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

Reason for change: The GPRS support for IPv6 was altered in the Release 99 of the specifications to meet the needs of supporting IPv6 over GPRS. 23.060 got an addition for the IPv6 address allocation. However, the current header compression (RFC1144) does not support IPv6 header compression. To meet the needs of Release 99 protocol support, this CR adds the support for RFC2507 header compression.

Clauses affected: 2, 6.5.1.1.4, 6.5.2, 6.5.x

Other specs affected:

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

Other comments:

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.
- For this Release 1999 document, references to GSM documents are for Release 1999 versions (version 8.x.y).

[X] RFC-2507, M. Degermark, B. Nordgren, S. Pink: "IP Header Compression".

********** Next Change **********

6.5.1.1.4 Algorithm type

Table 4 show the list of protocol control information compression algorithms supported by the SNDCP layer. When new compression algorithms are needed for SNDCP, Table 4 shall be updated.

Table 1: List of protocol control information compression algorithms supported by SNDCP

Compression algorithm	Algorithm type (Range 0-31)
RFC1144	0
RFC2507	1
-	Other values Reserved

********** Next Change **********

6.5.2 TCP/IP header compression (RFC1144)

The protocol control information compression method is specific for each network layer protocol type. TCP/IP (IPv4) header compression is specified in RFC 1144 [9].

6.5.2.1 Parameters

Table 5 contains the parameters defined for a compression entity using TCP/IP header compression. They may be negotiated during SNDCP XID negotiation.

Table 2: RFC 1144 TCP/IP header compression parameters

			Parameters				
Algorithm Name	**Algorithm Type**	**Length**	**Parameter Name**	**Format**	**Range**	**Sense of Negotiation**	**Default Value**
RFC 1144	0	0, 2 or 3 if P bit is 0, 1, 3 or 4 if P bit is 1.	Applicable NSAPIs	bbbbbbbb bbb00000	0, 32, 64, … , 65504	down (each bit separately)	0
			S_0 - 1	bbbbbbbb	0 through 255	down	15

6.5.2.1.1 Applicable NSAPIs

See subclause 7.1.3.

6.5.2.1.2 S_0

The number of state slots, as defined in [9]. The S_0 range is 1 through 256, with 16 as default value.

6.5.2.2 Assignment of PCOMP values

The underlying service shall be able to distinguish the three types of compressed N-PDUs (i.e., Type IP, Uncompressed TCP, and Compressed TCP), as defined in RFC 1144 [9]. These three N-PDU types are differentiated by using different PCOMP values.

Two PCOMP values shall be assigned to the TCP/IP header compression algorithm. PCOMP1 shall contain the PCOMP value for the frame type "Uncompressed TCP", and PCOMP2 shall contain the PCOMP value for the frame type "Compressed TCP".

The PCOMP value of 0 shall be used for the frame type "Type IP".

6.5.2.3 Error Recovery

When TCP/IP header compression is used with unacknowledged peer-to-peer LLC operation, the decompression entity shall be notified in case an N-PDU is dropped, so that error recovery procedure (see [9]) can be invoked.

6.5.x TCP/IP and UDP/IP header compression (RFC 2507)

Detailed operation of the RFC 2507 header compression for IPv4 and IPv6 is described in clause 3 of the IETF specification RFC 2507 [X].

6.5.2.1 Parameters

Table 5 contains the parameters defined for a compression entity using RFC2507 header compression. They may be negotiated during SNDCP XID negotiation.

Table 3: RFC 2507 TCP/IP and UDP/IP header compression parameters

			Parameters				
Algorithm Name	**Algorithm Type**	**Length**	**Parameter Name**	**Format**	**Range**	**Sense of Negotiation**	**Default Value**
RFC 2507	1	0, 2, 4, 5, 6, 7 or 9 if P bit is 0, 3, 5, 7, 8, 9, 10 or 12 if P bit is 1.	Applicable NSAPIs	bbbbbbbb bbb00000	0, 32, 64, … , 65504	down (each bit separately)	0
			F_MAX_PERIOD	bbbbbbbb bbbbbbbb	1-65535	From compressor to decompressor	256
			F_MAX_TIME	bbbbbbbb	1-255	From compressor to decompressor	5
			MAX_HEADER	bbbbbbbb	60-255	From compressor to decompressor	168
			TCP_SPACE	bbbbbbbb	3-255	From compressor to decompressor	15
			NON_TCP_SPACE	bbbbbbbb bbbbbbbb	3-65535	From compressor to decompressor	15

The explanation of the individual parameters can be found in the clause 14 of the IETF specification RFC 2507 [X].

6.5.X.1.1 Applicable NSAPIs

See subclause 7.1.3.

6.5.x.2 Assignment of PCOMP values for RFC2507

The following PCOMP values shall be assigned to the RFC 2507 header compression. The PCOMP value 0 shall be used for regular IPv4 and IPv6 packets.

Table 2: PCOMP values assigned to RFC 2507 header compression algorithm

PID value	Packet type
PCOMP1	Full header
PCOMP2	Compressed TCP
PCOMP3	Compressed TCP non-delta
PCOMP4	Compressed non-TCP
PCOMP5	Context state

6.5.X.3 Error Recovery

The mechanisms related to error recovery and packet reordering are described in clauses 10 and 11 of the RFC 2507[X].