TSG-RAN Meeting #8
Düsseldorf, Germany, 21 - 23 June 2000

TSGRP#8(00)0233

Title: **Agreed CRs to TS 25.412**

Source: **TSG-RAN WG3**

Agenda item: 5.3.3

Tdoc_Num	Specification	CR_Num	Revision_Nu	CR_Subject	CR_Category	WG_Status	Cur_Ver_Num	New_Ver_Nu
R3-001540	25.412	003	1	Clarification of ATM cell format	F	agreed	3.3.0	3.4.0
R3-001600	25.412	004	1	Correction to version number of SCTP and	F	agreed	3.3.0	3.4.0

3GPP TAG RAN WG3 Meeting #13
O'ahu, Hawai'i, USA, 22 – 26 May, 2000

Document **R3-001540**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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

25.412	CR	003r1	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:	RAN#8	for approval	X	strategic		(for SMG
list expected approval meeting # here ↑		for information		non-strategic		use only)

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

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

Source:	R_WG3		**Date:**	24 May, 2000

Subject: Clarification of ATM cell format

Work item:

Category:

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

(only one category shall be marked with an X)

Reason for change:

The ITU-T ATM Layer Specification I.361 provides three options:
- - ATM layer for NNI
- - ATM layer for UNI without use of GFC
- - ATM layer for UNI with GFC.
Seamless interworking between these options is not possible.
Therefore, the user of this specification has to choose one of the options for a particular interface.
ATM based Iu and Iur interfaces are interfaces between network nodes or networks (RAN, CN). **Therefore, the NNI cell format has to be chosen for the ATM layer**.
Note: In contrast, the UNI cell format is chosen for interfaces between a user terminal and the operator's ATM network.

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

4 ATM Layer

4.1 General

ATM shall be used in the radio network control plane according to I.361 [5]. The structure of the cell header used in the UTRAN Iu interface is the cell header format and encoding at NNI (see Figure 3/I.361).

3GPP TSG-RAN WG3 Meeting #11
Hawaii, USA, May 22-26th 2000

Document **R3-001600**

CHANGE REQUEST

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25.412	CR	04r1	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:	TSG-RAN#8	for approval	X		strategic		*(for SMG*
list expected approval meeting # here ↑		for information			non-strategic		*use only)*

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

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

Source: R_WG3   **Date:** 25 May 2000

Subject: Corrections to SCTP and M3UA Version Numbers and SCTP name

Work item:

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

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

Reason for change: Update to latest available versions of SCTP and M3UA.

Clauses affected: 2 References
                       5.3 Signalling Bearer for Packet Switched Domain

Other specs affected:

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

Other comments:

help.doc

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

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.

[1]   ITU-T Recommendation Q.2100 (07/1994): "B-ISDN Signalling ATM Adaptation Layer (SAAL) - overview description".

[2]   ITU-T Recommendation Q.2110 (07/1994): "B-ISDN ATM Adaptation Layer – Service Specific Connection Oriented Protocol (SSCOP)".

[3]   ITU-T Recommendation Q.2140 (02/1995): "B-ISDN ATM adaptation layer – Service Specific Co-ordination Function for signalling at the Network Node Interface (SSCF AT NNI)".

[4]   ITU-T Recommendation Q.2210 (07/1996): "Message transfer part level 3 functions and messages using the services of ITU-T Recommendation Q.2140".

[5]   ITU-T Recommendation I.361 (11/1995): "B-ISDN ATM layer specification".

[6]   ITU-T Recommendation I.363.5 (08/1996): "B-ISDN ATM Adaptation Layer Type 5".

[7]   ITU-T Recommendation Q.711 (07/1996): "Functional description of the signalling connection control part".

[8]   ITU-T Recommendation Q.712 (07/1996): "Definition and function of Signalling connection control part messages".

[9]   ITU-T Recommendation Q.713 (07/1996): "Signalling connection control part formats and codes".

[10]   ITU-T Recommendation Q.714 (07/1996): "Signalling connection control part procedures".

[11]   ITU-T Recommendation Q.715 (07/1996): "Signalling connection control part user guide".

[12]   ITU-T Recommendation Q.716 (03/1993): "Signalling Connection Control Part (SCCP) performance".

[13]   IETF RFC 791 (09/1981): "Internet Protocol".

[14]   IETF RFC 1483 (07/1993): "Multim Protocol Encapsulation over ATM Adaptation Layer 5".

[15]   IETF RFC 2225 (04/1998): "Classical IP and ARP over ATM".

[16]   R. Stewart et al, "Stream Control Transmission Protocol", draft-ieft-sigtran-sctp-v9.txt (IESG Last Call Version), IETF, 19 April 2000.

[17]   G. Sidebottom et al, "SS7 MTP3 – User Adaptation Layer", draft-ietf-sigtran-m3ua-02.txt (Work In Progress), IETF, 10 March 2000.

3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AAL ATM Adaptation Layer
AAL5 ATM Adaptation Layer 5
ATM Asynchronous Transfer Mode
CS Circuit Switched
IP Internet Protocol

M3UA SS7 MTP3 User Adaptation Layer
MTP3-B Message Transfer Part
PS Packet Switched
RANAP Radio Access Network Application Part
RNC Radio Network Controller
SAAL-NNI Signalling ATM Adaptation Layer – Network Node Interface
SCCP Signalling Connection Control Part
SCTP Stream Control Transmission Protocol
SSCF Service Specific Co-ordination Function
SSCOP Service Specific Connection Oriented Protocol

4 ATM Layer

4.1 General

ATM shall be used in the radio network control plane according to I.361 [5].

5 RANAP Signalling Bearer

5.1 Introduction

This subclause specifies the Signaling Bearer protocol stack that supports the RANAP signaling protocol.

The following requirements on the Signalling Bearer can be stated:

- provide reliable transfer of control plane signalling messages in both connectionless mode and connection-oriented mode;

- provide separate independent connections for distinguishing transactions with individual UE's;

- supervise the 'UE connections' and provide connection status information to the Upper Layers for individual UE's;

- provide networking and routing functions;

- provide redundancy in the signalling network;

- provide load sharing.

5.2 Signalling Bearer for Circuit Switched Domain

The following figure 1 illustrates the protocol model having Broadband Signalling System No.7 as the signalling bearer for RANAP over the Iu interface that fulfils the requirements. Figure 1 shows, for the CS domain, the point at which the service primitives are invoked. The SAP provides the SCCP primitives.
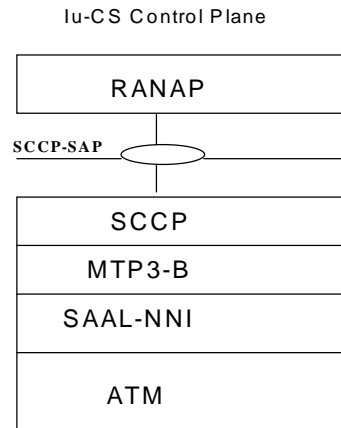
Iu-CS Control Plane

```
                    +---------------------------+
                    |          RANAP            |
                    +---------------------------+
                                |
SCCP-SAP        ━━━━━━━━━━(       )━━━━━━━━━━━━━━━
                                |
                    +---------------------------+
                    |          SCCP             |
                    +---------------------------+
                    |         MTP3-B            |
                    +---------------------------+
                    |        SAAL-NNI           |
                    +---------------------------+
                    |          ATM              |
                    +---------------------------+
```

Figure 1: SAP between RANAP and its transport for Iu - CS Domain

1. **SCCP** [7] provides connectionless service, class 0, connection oriented service, class 2, separation of the connections mobile by mobile basis on the connection oriented link and establishment of a connection oriented link mobile by mobile basis.

2. **MTP3-B** [4] provides message routing, discrimination and distribution (for point-to-point link only), signalling link management load sharing and changeover/back between link within one link-set. The need for multiple link-sets is precluded.

3. **SAAL-NNI** [1] consists of the following sub-layers: - **SSCF** [3], - **SSCOP** [2] and – **AAL5** [6]. The SSCF maps the requirements of the layer above to the requirements of SSCOP. Also SAAL connection management, link status and remote processor status mechanisms are provided. SSCOP provides mechanisms for the establishment and release of connections and the reliable exchange of signalling information between signalling entities. Adapts the upper layer protocol to the requirements of the Lower ATM cells.

4. **ATM** [5].

5.3 Signalling Bearer for Packet Switched Domain

The protocol stacks for the PS Domain is shown in figure 2. The standard allows operators to chose one out of two standardised protocol to suites for transport of SCCP messages.
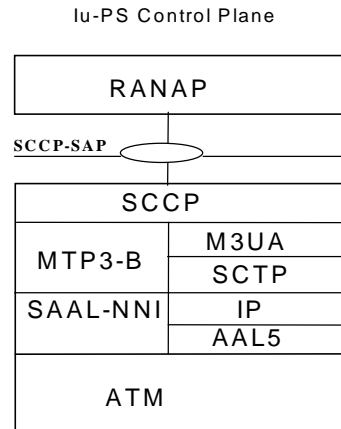
Iu-PS Control Plane

Figure 2: SAP between RANAP and its transport for the Iu –IP domain

Figure 2 shows, for the Iu IP domain, the point at which the service primitives are invoked. A single SAP is defined independently of the signalling bearer. The SAP provides the SCCP primitives. The figure is not intended to constrain the architecture.

1. **SCCP** [7] provides connectionless service, class 0, connection oriented service, class 2, separation of the connections mobile by mobile basis on the connection oriented link and establishment of a connection oriented link mobile by mobile basis.

2. **MTP3-B** [4] provides message routing, discrimination and distribution (for point-to-point link only), signalling link management load sharing and changeover/back between link within one link-set. The need for multiple link-sets is precluded.

3. **SAAL-NNI** [1] consists of the following sub-layers: - **SSCF-NNI** [3], - **SSCOP** [2] and – **AAL5** [6]. The SSCF maps the requirements of the layer above to the requirements of SSCOP. Also SAAL connection management, link status and remote processor status mechanisms are provided. SSCOP provides mechanisms for the establishment and release of connections and the reliable exchange of signalling information between signalling entities. Adapts the upper layer protocol to the requirements of the Lower ATM cells.

4. **ATM** [5].

5. **SCTP** [16] refers to the Stream Control Transmission Protocol [16] developed by the Sigtran working group of the IETF for the purpose of transporting various signalling protocols over IP networks. M3UA refers to the SCCP adaptation layer "SS7 MTP3 – User Adaptation Layer " [17] also developed by the Sigtran working group of the IETF.

6. **IP** [13] over ATM is defined in [14] and [15].

5.4   Services Provided by the Signalling Bearer

When considering the requirements that the upper layers, i.e. RANAP, have on the Signalling Bearer, there are a number of services it has to provide and a number of functions to perform. These numbers of services that the signalling bearer shall provide, to the upper layers, are stated in the references [7] to [12].

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