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Technical Specification

3rd Generation Partnership Project (3GPP); Technical Specification Group (TSG) RAN; UTRAN Iu Interface Signalling Transport



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Foreword

This Technical Specification has been produced by the 3GPP.

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where:

x the first digit:

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1 Scope

The present document specifies the standards for Signalling Transport to be used across Iu Interface. Iu Interface is a logical interface between the RNC and the UTRAN Core Network. This document describes how the RANAP signalling messages are transported over Iu.

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.
1. **Q.2100** (7/94) B-ISDN signalling ATM adaptation layer (SAAL) – overview description.
 2. **Q.2110** (7/94) B-ISDN ATM adaptation layer – Service specific connection oriented protocol (SSCOP).
 3. **Q.2140** (2/95) B-ISDN ATM adaptation layer – Service specific coordination function for signalling at the network node interface (SSCF AT NNI).
 4. **Q.2210** (7/96) Message transfer part level 3 functions and messages using the services of ITU-T Recommendation Q.2140.
 5. **I.361** (11/95) B-ISDN ATM layer specification.
 6. **I.363.5** (8/96) B-ISDN ATM Adaptation Layer Type 5.
 7. **Q.711** (7/96) Functional description of the signalling connection control part
 8. **Q.712** (7/96) Definition and function of Signalling connection control part messages
 9. **Q.713** (7/96) Signalling connection control part formats and codes
 10. **Q.714** (7/96) Signalling connection control part procedures
 11. **Q.715** (7/96) Signalling connection control part user guide
 12. **Q.716** (3/93) Signalling connection control part (SCCP) performance
 13. ITU-T Rec. **I.630** (2/99) ATM Protection Switching
 14. **IETF RFC 791** (9/1981): Internet Protocol
 15. IETF RFC 1483 (7/1993): “Multiprotocol Encapsulation over ATM Adaptation Layer 5”
 16. IETF RFC 2225 (4/1998): “Classical IP and ARP over ATM”
 17. IETF RFC 768 (8/1980): “User Datagram Protocol”
 18. R. Stewart et al, “Simple Control Transmission Protocol”, draft-ietf-sigtran-sctp-v0.txt (Work In Progress), IETF, September 1999
 19. G. Sidebottom et al, “SS7 ISUP Tunneling”, draft-ietf-sigtran-itun-00.txt (Work In Progress), IETF, June 1999

3 Definitions, symbols and abbreviations

3.1 Definitions

3.2 Symbols

3.3 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
ITUN	SS7 ISUP Tunnelling (Adaptation layer for ISUP and SCCP for SCTP)
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
SSCF	Service Specific Co-ordination Function
SCCP	Signalling Connection Control Part
SCTP	Simple Control Transmission Protocol
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].

4.2 Protection Switching at ATM Layer

If redundancy of pathways at ATM layer between CN and RNC is supported, it shall be implemented using ATM Protection Switching according to I.630 [13].

5 RANAP Signalling Bearer

5.1 Introduction

This chapter 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.

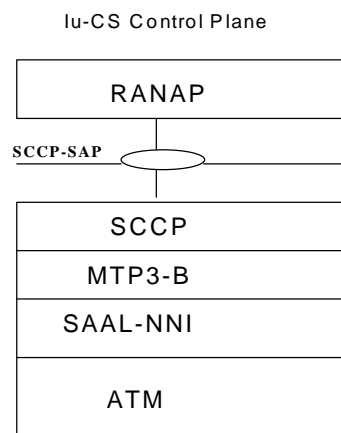


Figure 1 SAP between RANAP and its transport for Iu – CS Domain

- 1 **SCCP** [7] provides connectionless service, class 0, connectionless service with guaranteed order, class 1, 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.

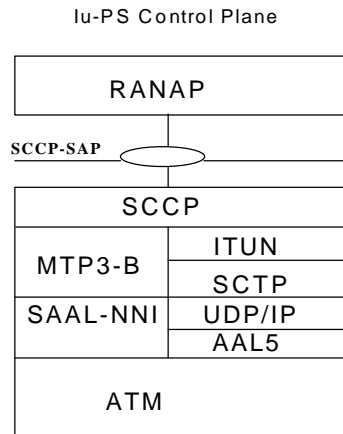


Figure 2 SAP between RANAP and its transport for the Iu –IP domain

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, connectionless service with guaranteed order, class 1, 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** [18] refers to the Simple Control Transmission Protocol [18] developed by the Sigtran working group of the IETF for the purpose of transporting various signaling protocols over IP networks. . ITUN refers to the SCCP adaptation layer “SS7 ISUP Tunneling” [19] also developed by the Sigtran working group of the IETF.
- 6 **UDP** [16] /**IP** [14] over ATM are defined in [15] and [16]

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 number of services that the signaling bearer shall provide, to the upper layers, are stated in the references [7] to [12].

History

Document history		
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