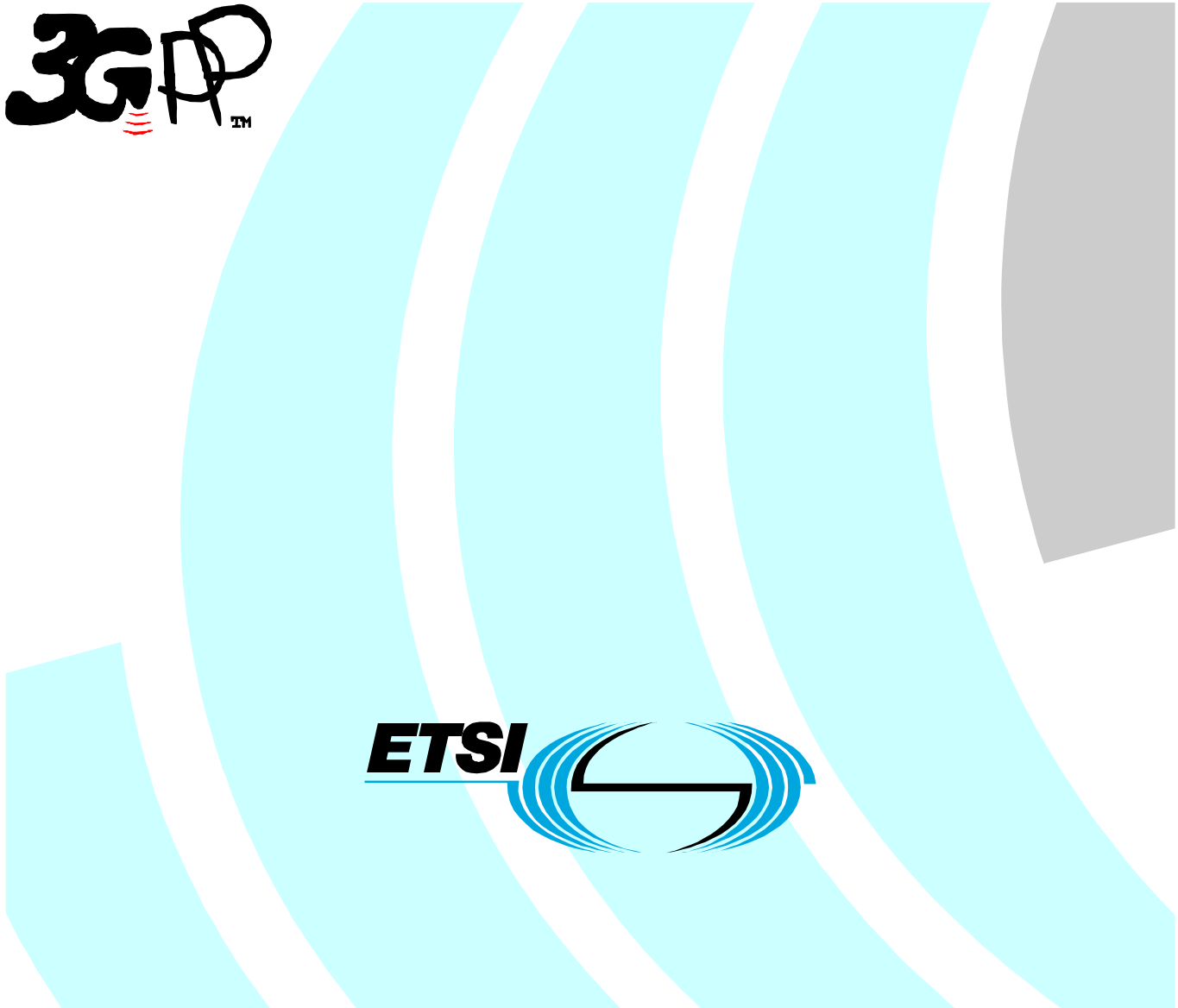
ETSI TS 125 424 V6.1.0 (2004-03)

Technical Specification

**Universal Mobile Telecommunications System (UMTS);
UTRAN Iur interface data transport and
transport signalling for CCH data streams
(3GPP TS 25.424 version 6.1.0 Release 6)**



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Foreword

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The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp .

Contents

Foreword

This Technical Specification (TS) has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document shall provide a specification of the UTRAN RNC-RNC (Iur) interface Data Transport and Transport Signalling for Common Transport Channel data streams.

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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document.*

[1] ITU-T Recommendation I.361 (11/95): "B-ISDN ATM Layer Specification".

[2] ITU-T Recommendation I.363.2 (11/2000): "B-ISDN ATM Adaptation Layer type 2".

[3] ITU-T Recommendation I.366.1 (6/98): "Segmentation and Re-assembly Service Specific Convergence Sublayer for the AAL type 2".

[4] New ITU-T Recommendation Q.2630.1 (12/99): "AAL Type 2 signalling protocol (Capability Set 1)".

[5] ITU-T Recommendation E.191 (03/00): "B-ISDN addressing".

[6] 3GPP TS 25.426: "UTRAN I_{ur} and I_{ub} Interface Data Transport & Transport Signalling for DCH Data Streams".

[7] 3GPP TS 25.434: "UTRAN I_{ub} Interface Data Transport & Transport Signalling for Common Transport Channel Data Streams".

[8] ITU-T Recommendation Q.2630.2 (12/2000): "AAL Type 2 signalling protocol (Capability Set 2)".

[9] ITU-T Recommendation X.213 (11/95): "Information Technology - Open Systems Interconnection - Network Service Definition".

[10] IETF STD 51, RFC 1661 (July 1994): "The Point-To-Point Protocol (PPP)".

[11] IETF STD 51, RFC 1662 July 1994: "PPP in HDLC-like Framing".

[12] IETF RFC 2507 (February 1999): "IP header compression".

[13] IETF RFC 1990 "The PPP Multilink Protocol (MP)".

[14] IETF RFC 2686 "The Multi-Class Extension to Multi-Link PPP".

[15] IETF RFC 2509 (February 1999): "IP Header Compression over PPP".

[16] IETF RFC 2460 "Internet Protocol, Version 6 (Ipv6) Specification".

[17] IETF RFC 791 (1981): "Internet Protocol".

[18] IETF RFC 2474 (December 1998): "Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers".

[19] IETF RFC 768 (8/1980): "User Datagram Protocol".

[20] IETF RFC 3153 (1/2001): "PPP Multiplexing".

[21] IETF RFC 2364 (1/2001): "PPP over AAL5".

[22] IETF RFC 3031 (1/2001):"Multiprotocol Label Switching Architecture".

[23] ITU-T Recommendation E.164 (5/97): " The international public telecommunication numbering plan ".

3 Definitions and abbreviations

3.1 Definitions

Common Transport Channels are defined as transport channels that are shared by several users i.e. RACH, CPCH [FDD], FACH, DSCH and HS-DSCH.

3.2 Abbreviations

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

AAL2	ATM Adaptation Layer type 2
AAL5	ATM Adaptation Layer type 5
AESA	ATM End System Address
ALCAP	Access Link Control Application Part
ATM	Asynchronous Transfer Mode
CPCH	Common Packet Channel
CPS	Common Part Sublayer
DiffServ	Differentiated Services
DSCH	Downlink Shared Channel
FACH	Forward Access Channel
HDLC	High level Data Link Control
HS-DSCH	High Speed Downlink Shared Channel
IP	Internet Protocol
IPv4	Internet Protocol, version 4
IPv6	Internet Protocol, version 6
IWF	Interworking Function
IWU	Interworking Unit
LC	Link Characteristics
ML/MC PPP	Multilink-Multiclass PPP
MPLS	Multiprotocol Label Switching
MTP	Message Transfer Part
NNI	Network-Node Interface
NSAP	Network Service Access Point
PPP	Point-to-Point Protocol
PPPMux	PPP Multiplexing
PT	Path Type
QoS	Quality of Service
RACH	Random Access Channel
SAAL	Signalling ATM Adaptation Layer
SDU	Service Data Unit
SSCOP	Service Specific Connection Oriented Protocol
SSCF	Service Specific Co-ordination Function
SSCS	Service Specific Convergence Sublayer
SSSAR	Service Specific Segmentation and Re-assembly sublayer
STC	Signalling Transport Converter
TNL	Transport Network Layer
UDP	User Datagram Protocol

UNI User-Network Interface
USCH Uplink Shared Channel

4 Data Link Layer

4.1 ATM Transport Option

ATM shall be used in the transport network user plane and the transport network control plane according to ITU-T Recommendation I.361 [1]. The structure of the cell header used in the UTRAN Iur interface is the cell header format and encoding at NNI (see Figure 3/I.361 [1]).

4.2 IP Transport Option

A UTRAN Node supporting IP transport option shall support PPP protocol with HDLC framing [10], [11].

Note: This does not preclude the single implementation and use of any other data link layer protocols (e.g. PPPMux/AAL5/ATM [20, 21], PPP/AAL2/ATM, Ethernet, MPLS/ATM [22], etc.) fulfilling the UTRAN requirements toward the upper layers.

An RNC using IP transport option having interfaces connected via slow bandwidth PPP links like E1/T1/J1 shall also support IP Header Compression [12] and the PPP extensions ML/MC-PPP [13], [14]. In this case, negotiation of header compression [12] over PPP shall be performed via [15].

5 I_{ur} Data Transport for Common Transport Channel Data Streams

5.1 Introduction

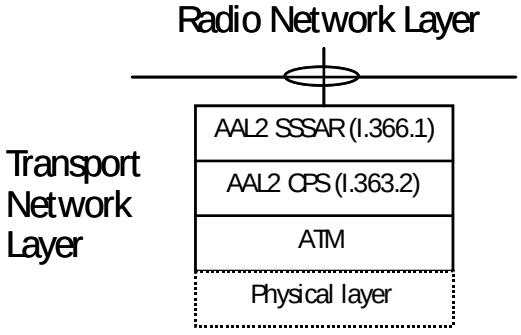
This clause specifies the transport layers that support Common Channels (FACH, RACH, CPCH [FDD], DSCH, HS-DSCH, USCH [TDD]) Iur data streams.

There are two options for the transport layer of the Common Channels data streams in Iur and Iub:

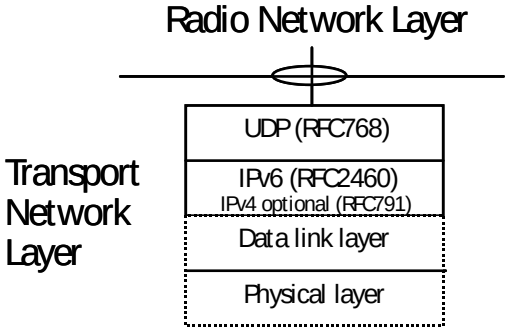
1) ATM based Transport (ATM transport option)

2) IP based Transport (IP transport option)

The following figure shows the protocol stacks of the two options.



Protocol stack for ATM transport option



Protocol stack for IP transport option

Figure 1: Transport network layer for DCH data streams over Iur and Iub interfaces

5.2 ATM Transport Option

ATM [1], AAL type 2 (ITU-T Recommendations I.363.2 [2] and I.366.1 [3]) is used as the standard transport layer for RACH, CPCH [FDD], FACH, USCH [TDD], DSCH and HS-DSCH Iur data streams.

These AAL2 connections are established via the transport signalling protocol described in clause 5.

Figure 1 shows the protocol stack for the transport of RACH, CPCH [FDD], FACH, USCH [TDD], DSCH and HS-DSCH Iur data streams using the ATM Transport Option. Service Specific Segmentation and Re-assembly (SSSAR) is used for the segmentation and re-assembly of AAL2 SDUs (i.e. SSSAR is only considered from ITU-T Recommendation I.366.1 [3]).

5.3 IP Option

UDP [18] over IP shall be used as the transport for DCH data streams on Iub and Iur interfaces. The data link layer is as specified in subclause 4.2.

An IP UTRAN Node shall support IPv6 [16]. The support of IPv4 [17] is optional.

Note: This does not preclude single implementation of IPv4.

IP dual stack support is recommended for the potential transition period from IPv4 to IPv6 in the transport network.

The transport bearer is identified by the UDP port number and the IP address (source UDP port number, destination UDP port number, source IP address, destination IP address).

IP Differentiated Services code point marking [18] shall be supported. The mapping between traffic categories and Diffserv code points shall be configurable by O&M. Traffic categories are implementation-specific and may be determined from the application parameters.

6 I_{ur} Transport Signalling Application for Common Transport Channel Data Streams

6.1 Introduction

This clause specifies the transport signalling protocol(s) used to establish the user plane transport bearers. The protocol stack is shown in [6].

6.2 Transport Signalling in case of ATM option

AAL2 signalling protocol Capability Set 2, ITU-T Recommendation Q.2630.2 [8], is the signalling protocol to control the AAL2 connections on Iur interfaces. Q.2630.2 [8] adds new optional capabilities to Q.2630.1 [4].

AAL2 transport layer addressing is based on embedded E.164 or other AESA variants of the NSAP addressing format [5,9]. Native E.164 [23] addressing shall not be used.

Binding ID provided by the radio network layer shall be copied in SUGR parameter of ESTABLISH.request primitive of [8]. The binding identifier shall already be assigned and tied to a radio application procedure when the Establish Request message is received over the Iur interface in the Drift RNC.

User Plane Transport bearers are established and in all normal cases released by the ALCAP in the Serving RNC.

The Link Characteristics parameter (LC) shall be included in the Establish Request message and in the Modification Request message of AAL2 signalling protocol.

If there is an AAL2 switching function in the transport network layer of the interface, the Path Type parameter (PT) may be included in the Establish Request message of AAL2 signalling protocol for prioritisation at ATM level.

If the value in either the Maximum CPS-SDU Bit Rate or the Average CPS-SDU Bit Rate of the Link Characteristics(LC) in AAL 2 signalling messages as specified in reference [8] is 2048 Kbit/s, it shall be interpreted as bit rate 2048 Kbit/s or higher.

NOTE: Separation of traffic (e.g. HS-DSCH) that is using this modified interpretation of Link Characteristics in ref. [8] from other traffic is highly recommended. Otherwise the potential bursty nature of this specific traffic in combination with its unknown bit rate may decrease the QoS of all traffic within the same AAL type 2 path.

6.3 Transport Signalling in case of IP Transport Option

An ALCAP protocol is not required in case both RNCs are using the IP transport option.

7 Signalling Bearer for ALCAP on I_{ur} Interface

7.1 ATM Transport Option

The signalling bearer for the ALCAP on the Iur interface for common transport channels data streams is the same as the signalling bearer for the ALCAP on the Iur interface for DCH data streams, defined in [6].

7.2 IP Transport Option

An ALCAP protocol is not required in case both RNCs are using the IP transport option.

8 Interworking between ATM and IP Transport Options

An RNC supporting IP transport option shall provide interworking to an RNC supporting only ATM transport option. The interworking alternatives are defined in [6].

Annex A (informative): Change history

Change history					
TSG RAN#	Version	CR	Tdoc RAN	New Version	Subject/Comment
RAN_04	-	-	-	3.0.0	Approved by TSG-RAN by correspondence
RAN_05	3.0.0	-	-	3.1.0	Approved by TSG-RAN #5
RAN_07	3.1.0	-	-	3.2.0	Approved at TSG RAN #7
RAN_08	3.2.0	-	RP-000245	3.3.0	Approved at TSG RAN #8
RAN_09	3.3.0	005	RP-000382	3.4.0	Approved at TSG RAN #9
RAN_10	3.4.0	006	RP-000622	3.5.0	Approved at TSG RAN #10
RAN_11	3.5.0	007 008	RP-010119	3.6.0	Approved at TSG RAN #11

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
March 01	11	RP-010162	009		Approved at TSG RAN #11 and placed under Change Control	-	4.0.0
12/2001	14	RP-010857	013		Reference corrections	4.0.0	4.1.0
03/2002	15	RP-020171	019		Alignment of 25.424 to 25.426 and Correction to transport bearers release initiation	4.1.0	4.2.0
03/2002	15	RP-020189	020	1	Introduction of IP transport in UTRAN.	4.2.0	5.0.0
06/2002	16	RP-020408	023		Correction of Aesa formats	5.0.0	5.1.0
09/2003	21	RP-030538	025	3	Handling of maximum bit rate exceeding 2048kbit/s	5.1.0	5.2.0
12/2003	22	RP-030685	026	1	Diffserv marking is configurable	5.2.0	5.3.0
12/2003	22	-	-	-	Introduction of Release 6 specification	5.3.0	6.0.0
03/2004	23	RP-040061	028	-	Inclusion of HSDPA	6.0.0	6.1.0

History

Document history		
V6.0.0	December 2003	Publication
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