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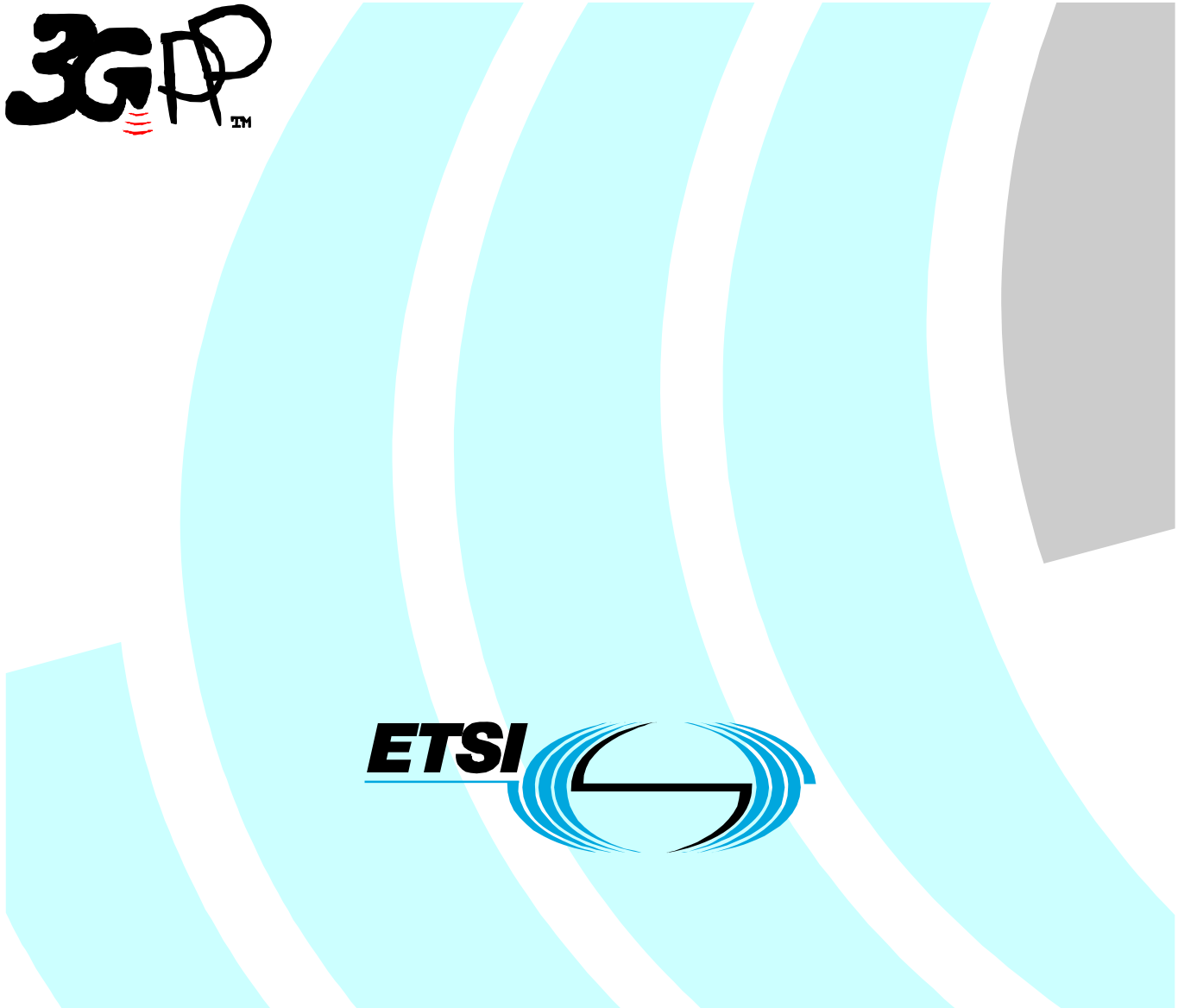
Technical Specification

**Universal Mobile Telecommunications System (UMTS);
UTRAN Iur interface data transport & transport signalling for
Common Transport Channel data streams
(3GPP TS 25.424 version 9.0.0 Release 9)**



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650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
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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, FACH, DSCH [TDD], USCH [TDD] 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
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

3.3 Specification Notations

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

[FDD] This tagging of a word indicates that the word preceding the tag "[FDD]" applies only to FDD. This tagging of a heading indicates that the heading preceding the tag "[FDD]" and the section following the heading applies only to FDD.

[TDD] This tagging of a word indicates that the word preceding the tag "[TDD]" applies only to TDD, including 3.84Mcps TDD, 7.68Mcps TDD and 1.28Mcps TDD. This tagging of a heading indicates that the heading preceding the tag "[TDD]" and the section following the heading applies only to TDD, including 3.84Mcps TDD, 7.68Mcps TDD and 1.28Mcps TDD.

[3.84Mcps TDD] This tagging of a word indicates that the word preceding the tag "[3.84Mcps TDD]" applies only to 3.84Mcps TDD. This tagging of a heading indicates that the heading preceding the tag "[3.84Mcps TDD]" and the section following the heading applies only to 3.84Mcps TDD.

[1.28Mcps TDD] This tagging of a word indicates that the word preceding the tag "[1.28Mcps TDD]" applies only to 1.28Mcps TDD. This tagging of a heading indicates that the heading preceding the tag "[1.28Mcps TDD]" and the section following the heading applies only to 1.28Mcps TDD.

[7.68Mcps TDD] This tagging of a word indicates that the word preceding the tag "[7.68Mcps TDD]" applies only to 7.68Mcps TDD. This tagging of a heading indicates that the heading preceding the tag "[7.68Mcps TDD]" and the section following the heading applies only to 7.68Mcps TDD.

[FDD - …] This tagging indicates that the enclosed text following the "[FDD - " applies only to FDD. Multiple sequential paragraphs applying only to FDD are enclosed separately to enable insertion of TDD specific (or common) paragraphs between the FDD specific paragraphs.

[TDD - …] This tagging indicates that the enclosed text following the "[TDD - " applies only to TDD including 3.84Mcps TDD, 7.68Mcps TDD and 1.28Mcps TDD. Multiple sequential paragraphs applying only to TDD are enclosed separately to enable insertion of FDD specific (or common) paragraphs between the TDD specific paragraphs.

[3.84Mcps TDD - …] This tagging indicates that the enclosed text following the "[3.84Mcps TDD - " applies only to 3.84Mcps TDD. Multiple sequential paragraphs applying only to 3.84Mcps TDD are enclosed separately to enable insertion of FDD and TDD specific (or common) paragraphs between the 3.84Mcps TDD specific paragraphs.

[1.28Mcps TDD - …] This tagging indicates that the enclosed text following the "[1.28Mcps TDD - " applies only to 1.28Mcps TDD. Multiple sequential paragraphs applying only to 1.28Mcps TDD are enclosed separately to enable insertion of FDD and TDD specific (or common) paragraphs between the 1.28Mcps TDD specific paragraphs.

[7.68Mcps TDD - …] This tagging indicates that the enclosed text following the "[7.68Mcps TDD - " applies only to 7.68Mcps TDD. Multiple sequential paragraphs applying only to 7.68Mcps TDD are enclosed separately to enable insertion of FDD and TDD specific (or common) paragraphs between the 7.68Mcps TDD specific paragraphs.

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

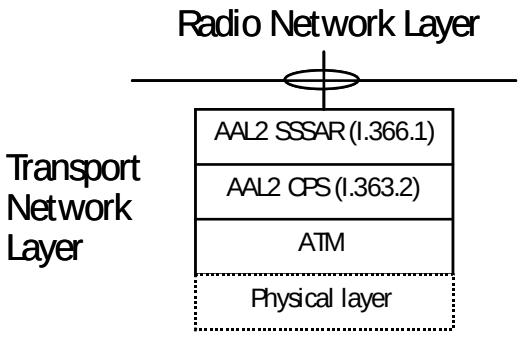
This clause specifies the transport layers that support Common Channels (FACH, RACH, DSCH [TDD], USCH [TDD], HS-DSCH) Iur data streams.

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

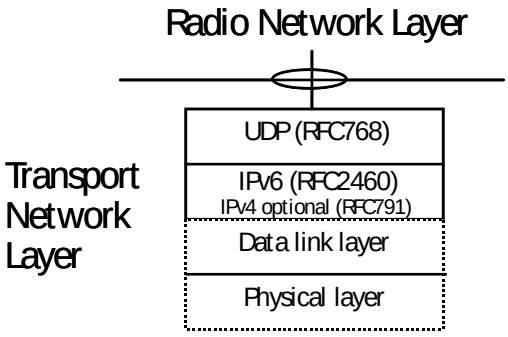
1) ATM based Transport (ATM transport option)

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, FACH, USCH [TDD], DSCH [TDD] 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, FACH, USCH [TDD], DSCH [TDD] 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 RACH, FACH, USCH [TDD], DSCH [TDD] and HS-DSCH data streams on Iur. 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 by the ALCAP in Serving RNC, and in all normal cases released by the ALCAP in the RNC which established the AAL2 connection.

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

Date / TSG	TSG Doc.	CR	Rev	Subject/Comment	New
12/2008	-	-	-	Creation of Rel-8 version based on v7.1.0	8.0.0
12/2009	-	-	-	Creation of Rel-9 version based on v8.0.0	9.0.0

History

Document history		
V9.0.0	January 2010	Publication