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Universal Mobile Telecommunications System (UMTS);
Iuh data transport
(3GPP TS 25.444 version 17.0.0 Release 17)

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Contents

Foreword

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

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- 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 specifies the standards for user data transport protocols between the HNB and HNB-GW/CN.

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] Void

[2] Void

[3] Void

[4] 3GPP TS 25.414: " UTRAN Iu interface data transport and transport signalling".

[5] Void

[6] Void

[7] Void

[8] IETF RFC 768 (1980-08): "User Datagram Protocol".

[9] IETF RFC 1889 (1996-01): "RTP: A Transport Protocol for Real-Time Applications".

[10] Void

[11] Void

[12] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [12] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [12].

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [12] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [12].

CN Core Network

CS	Circuit Switched
HNB	Home Node B
HNB-GW	Home Node B Gateway
IP	Internet Protocol
PS	Packet Switched
RFC	Request For Comment
RTP	Real-Time Transport Protocol
UDP	User Datagram Protocol

4 Data Link Layer

Any data link protocol that fulfils the requirements toward the upper layer may be used.

5 Circuit switched domain

5.1 Transport Network User Plane without bandwidth efficiency mechanisms

Defined in Reference TS 25.414 [4], subclause 5.1.3.

NOTE: The Transport Network Layer as described in ref TS 25.414 [4] subclause 5.1.3, may be directly between HNB and the CN.

5.3 Transport Network User Plane with bandwidth efficiency mechanisms

5.3.1 General

Bandwidth efficient transport of Uplink CS data payload PDUs may be supported over bearer transport mechanisms for the Iuh interface, using a bearer transport multiplexing scheme that allows transporting several RTP PDUs of different user plane connections within one packet.

5.3.2 Transport format

UDP/IP shall be applied on Iuh between HNB and HNB GW as described in TS 25.414 [4] for Iu between RNC and CN, subclause 5.1.3, except as stated below.

5.3.2.1 UDP

The path protocol used shall be UDP (IETF RFC 768 [8]). If multiplexing is applied the source UDP port number shall indicate the local termination used to combine the multiplexed packet and the destination UDP port number shall indicate the remote port number where PDUs are demultiplexed.

5.3.2.2 RTP

RTP (IETF RFC 1889[9]) shall be applied as described in TS 25.414 [4], subclause 5.1.3.3 and requirements below.

5.3.2.2.1 Transport Format for multiplexing RTP packets

Use of multiplexing shall be negotiated between the HNB and HNB-GW.

Before each multiplexed RTP/codec payload PDU inserted into the UDP/IP packet a Multiplex Header, which identifies the multiplexed packet, shall be inserted.

<table>
<tr><th colspan="8">Bits</th><th rowspan="2">Number of Octets</th><th rowspan="2"></th></tr>
<tr><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th></tr>
<tr><td colspan="8">Source IP, Dest IP, …</td><td>20/40</td><td>IP</td></tr>
<tr><td colspan="8">Source Port, Dest Port=<MUX UDP port>, Length, …</td><td>8</td><td>UDP</td></tr>
<tr><td>T=0</td><td colspan="7">Mux ID = (Destination UDP Port of multiplexed PDU) / 2</td><td>2</td><td rowspan="4">Multiplex Header</td></tr>
<tr><td colspan="8">Length Indicator (LI) = n</td><td>1</td></tr>
<tr><td>R</td><td colspan="7">Source ID = (Source UDP Port of multiplexed PDU) / 2</td><td>2</td></tr>
<tr><td colspan="8"></td><td></td></tr>
<tr><td colspan="8" rowspan="2">Full RTP packet</td><td rowspan="2">n</td><td>RTP header</td></tr>
<tr><td>RTP Payload</td></tr>
<tr><td colspan="8">Multiplex Header</td><td>5</td><td>Multiplex Header</td></tr>
<tr><td colspan="8" rowspan="2">Full RTP packet</td><td rowspan="2">m</td><td>RTP header</td></tr>
<tr><td>RTP Payload</td></tr>
<tr><td colspan="8">…</td><td></td><td></td></tr>
</table>

Figure 1: UDP/IP Packet with multiplexed RTP payload PDUs

The Multiplex Header includes :

- T bit.

  The field has two possible values. Value 0 shall be used for an uncompressed RTP header, as decribed in the present sub-clause. Value 1 is FFS.

- Mux ID, 15 bits.

  For identification of different user plane connections. The value shall be the UDP destination port of the corresponding non-multiplexed RTP PDU packet divided by two (only even numbered ports are used for RTP sessions).

- Length Indicator (LI), 8 bits, unsigned integer.

  Gives the length of the multiplexed RTP PDU packet (RTP header + RTP) in bytes (the last byte of the RTP PDU is padded to the next byte boundary if necessary). Maximum length is 255 bytes. This LI allows to calculate where the next Multiplex Header for the next multiplexed RTP PDU packet starts.

- R bit.

  Reserved for future use. Shall be set to 0 by the sending entity and be ignored by the receiving entity.

- Source ID, 15 bits.

  For identification of the different connections. The value shall be the source UDP port of the corresponding non-multiplexed RTP/codec PDU packet divided by two (only even numbered ports are used for RTP sessions).

The multiplexed RTP PDU shall be inserted in the IP/UDP packet directly after the corresponding Multiplex Header. The multiplexed RTP packet PDU shall follow the rules defined in IETF RFC 1889 [9] and consists of the full RTP header and the RTP payload. If the multiplexed RTP packet PDU does not end at a byte boundary, then the remaining bits of its last byte shall be padded with zeros.

The multiplexing method does not limit the number of packets being multiplexed and it is thus the data link layer protocol that defines the maximum frame size. In order to avoid additional delay in the network the packets should not be delayed more than 1 ms to 2 ms, which also effectively limits the number of multiplexed packets and makes the multiplexing-jitter low.

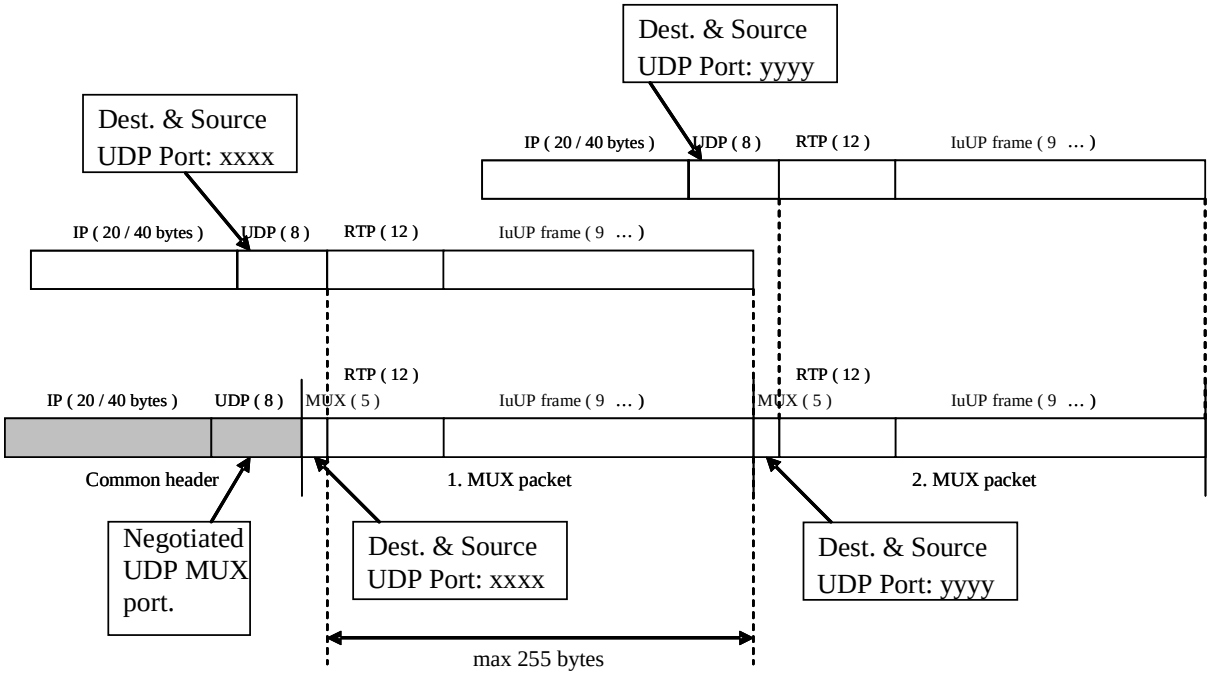

Figure 2: Example of multiplexed packet with two RTP frames

6 Packet switched domain

6.1 Transport network user plane

Defined in Ref TS 25.414 [4] subclause 6.1.3.

NOTE: The Transport Network Layer as described in ref TS 25.414 [4] subclause 6.1.3, may be directly between HNB and the CN.

Annex A (informative): Change history

TSG #	TSG Doc.	CR	Rev	Subject/Comment	New
				Initial Skeleton	0.1.0
				Addition of TP for signalling for bandwidth efficiency	0.2.0
				Presented for approval at RAN#46	2.0.0
46	RP-091104			Approved at RAN#46	9.0.0
				Editoral clean up	9.0.1
				Version number in the change history corrected	9.0.2
SP-49	SP-100629			Clarification on the use of References (TS 21.801 CR#0030)	9.0.3
03/2011				Created Rel-10 version based on v9.0.3	10.0.0
52	RP-110684	0002		Corrrection of references	10.1.0
09/2012				Update to Rel-11 version (MCC)	11.0.0
09/2014				Update to Rel-12 version (MCC)	12.0.0
12/2015				Update to Rel-13 version (MCC)	13.0.0

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2017-03	SA#75					Promotion to Release 14 without technical change	14.0.0
2018-07	SA#80	-	-	-	-	Promotion to Release 15 without technical change	15.0.0
2020-07	SA#88-e	-	-	-	-	Update to Rel-16 version (MCC)	16.0.0
2022-03	SA#95-e					Promotion to Release 17 without technical change	17.0.0

History

Document history		
V17.0.0	April 2022	Publication