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TECHNICAL SPECIFICATION

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Contents

Foreword

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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 and related signalling protocols to establish user plane transport bearers over the Xn interface.

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

[2]   3GPP TS 29.281: "General Packet Radio System (GPRS) Tunnelling Protocol User Plane (GTPv1-U)".

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

[4]   IETF RFC 2474 (1998-12): "Definition of the Differentiated Services Field (DS Field) in the Ipv4 and Ipv6 Headers".

[5]   IETF RFC 2460 (1998-12): "Internet Protocol, Version 6 (IPv6) Specification".

[6]   IETF RFC 791 (1981-09): "Internet Protocol".

[7]   3GPP TS 38.300: "NR;Overall Description; Stage 2".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions below apply. Terms and definitions not defined below can be found in TR 21.905 [1].

NG-RAN node: as defined in TS 38.300 [7].

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

GTP	GPRS Tunnelling Protocol
IP	Internet Protocol
PDCP	Packet Data Convergence Protocol
PDU	Protocol Data Unit
TEID	Tunnel Endpoint Identifier
UDP	User Datagram Protocol

4 Data link layer

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

5 Xn interface user plane protocol

5.1 General

The transport layer for data streams over Xn is an IP based Transport. The following figure shows the transport protocol stacks over Xn.
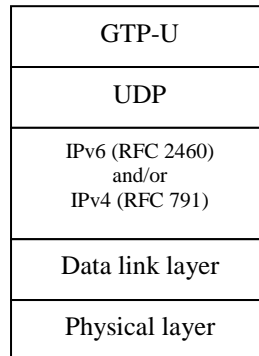
```
┌─────────────────────────┐
│          GTP-U          │
├─────────────────────────┤
│           UDP           │
├─────────────────────────┤
│    IPv6 (RFC 2460)      │
│         and/or          │
│     IPv4 (RFC 791)      │
├─────────────────────────┤
│     Data link layer     │
├─────────────────────────┤
│     Physical layer      │
└─────────────────────────┘
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Figure 5.1: Transport network layer for data streams over Xn

The GTP-U (TS 29.281 [2]) protocol over UDP over IP shall be supported as the transport for data streams on the Xn interface. The data link layer is as specified in clause 4.

The transport bearer is identified by the GTP-U TEID (TS 29.281 [3]) and the IP address (source TEID, destination TEID, source IP address, destination IP address).

5.2 GTP-U

The GTP-U (TS 29.281 [2]) protocol shall be used over the Xn interface between two NG-RAN nodes.

5.3 UDP/IP

The path protocol used shall be UDP (IETF RFC 768 [3]).

The UDP port number for GTP-U shall be as defined in TS 29.281 [2].

The NG-RAN nodes over the Xn interface shall support fragmentation and assembly of GTP packets at the IP layer.

The NG-RAN nodes shall support IPv6 (IETF RFC 2460 [5]) and/or IPv4 (IETF RFC 791 [6]).

There may be one or several IP addresses in both NG-RAN nodes. The packet processing function in the source NG-RAN node shall send downstream packets of a given flow to the target NG-RAN node. IP address (received in XnAP) associated to the DL transport bearer of that particular flow. The packet processing function in the source NG-RAN node shall send upstream packets of a given flow to the target NG-RAN node IP address (received in XnAP) associated to the UL transport bearer of that particular flow.

The Transport Layer Address signalled in XnAP messages is a bit string of:

a) 32 bits in case of IPv4 address according to IETF RFC 791 [6]; or

b) 128 bits in case of IPv6 address according to IETF RFC 2460 [5]; or

c) 160 bits if both IPv4 and IPv6 addresses are signalled, in which case the IPv4 address is contained in the first 32 bits.

5.4 DiffServ code point marking

IP Differentiated Services code point marking (IETF RFC 2474 [4]) shall be supported. The mapping between traffic categories and DiffServ code points shall be configurable by O&M based on 5G QoS Class Identifier (5QI)

characteristics (QoS details are FFS) and other NG-RAN traffic parameters. Traffic categories are implementation-specific and may be determined from the application parameters.

Annex A (informative): Change history

Change history							
Date	**Meeting**	**TDoc**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**New version**
May 2017	R3#96	R3-171482				Initial draft TS	0.0.2
May 2017	R3#96	R3-172020				FFS for GTP-U reference Flows instead of bearers Diffserv codepoints and 5QI	0.1.0
June 2017	R3 NR#02	R3-172635				0.1.0 agreed	0.2.0
January 2018	R3 NR#03	R3-180546				Correct specification name, NG-RAN node instead of Gnb	0.3.0
April 2018	R3#99bis	R3-182528				Editorial in document title Remove FFS	0.4.0
June 2018	RAN#80	RP-180814				Presentation to RAN	1.0.0
2018-06	RAN#80		-	-	-	Specification approved at TSG-RAN and placed under change control	15.0.0

History

Document history		
V15.0.0	July 2018	Publication