ETSI TS 138 424 V17.0.0 (2022-04)

TECHNICAL SPECIFICATION

5G;
NG-RAN;
Xn data transport
(3GPP TS 38.424 version 17.0.0 Release 17)

ETSI

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 - APE 7112B
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° w061004871

Important notice

The present document can be downloaded from:
http://www.etsi.org/standards-search

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at
https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx

If you find errors in the present document, please send your comment to one of the following services:
https://portal.etsi.org/People/CommiteeSupportStaff.aspx

If you find a security vulnerability in the present document, please report it through our
Coordinated Vulnerability Disclosure Program:
https://www.etsi.org/standards/coordinated-vulnerability-disclosure

Notice of disclaimer & limitation of liability

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.
No recommendation as to products and services or vendors is made or should be implied.
No representation or warranty is made that this deliverable is technically accurate or sufficient or conforms to any law and/or governmental rule and/or regulation and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights.
In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (https://ipr.etsi.org/).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM**® and the GSM logo are trademarks registered and owned by the GSM Association.

Legal Notice

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

The present document may refer to technical specifications or reports using their 3GPP identities. These shall be interpreted as being references to the corresponding ETSI deliverables.

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

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Contents

Foreword

This Technical Specification 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 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 8200 (2017-07): "Internet Protocol, Version 6 (IPv6) Specification".

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

[7]   3GPP TS 38.300: "NR; NR and NG-RAN 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
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
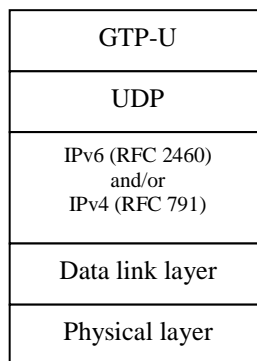
Figure 5.1: Transport network layer for data streams over Xn

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 8200 [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 8200 [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) , the Priority Level (if explicitly signalled), and other NG-RAN traffic parameters (e.g. ARP). 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
2018-09	RAN#81	RP-181920	0001	-	F	Updated reference to IPv6	15.1.0
2019-07	RAN#84	RP-191396	0005	1	F	Use of Priority Level and ARP for the DSCP Derivation at the gNB	15.2.0
2020-07	RAN#88-e	RP-201085	0006	-	F	Rapporteur's Update for 38.424	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