

# ETSI TS 138 424 V15.2.0 (2019-07)



TECHNICAL SPECIFICATION

**5G;  
NG-RAN;  
Xn data transport  
(3GPP TS 38.424 version 15.2.0 Release 15)**

*iTeh STANDARD PREVIEW  
(standards.iteh.ai)  
Full standard available at <https://standards.iteh.ai/catalog/standards/sist/be7b2456-3316-44ef-beee-666b22e49837/etsi-ts-138-424-v15.2.0-2019-07>*



---

Reference

RTS/TSGR-0338424vf20

---

Keywords

---

5G

**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 - NAF 742 C  
Association à but non lucratif enregistrée à la  
Sous-Préfecture de Grasse (06) N° 7803/88

---

**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](http://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>

---

**Copyright Notification**

---

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2019.  
All rights reserved.

**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.

---

# Intellectual Property Rights

## Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is 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 IPR Policy, no investigation, 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.

---

# 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

Intellectual Property Rights .....	2
Legal Notice .....	2
Modal verbs terminology.....	2
Foreword.....	4
1 Scope .....	5
2 References .....	5
3 Definitions and abbreviations.....	5
3.1 Definitions .....	5
3.2 Abbreviations .....	5
4 Data link layer .....	6
5 Xn interface user plane protocol .....	6
5.1 General .....	6
5.2 GTP-U .....	6
5.3 UDP/IP .....	6
5.4 DiffServ code point marking .....	7
<b>Annex A (informative): Change history .....</b>	<b>8</b>
History .....	9

**iTeh STANDARD PREVIEW**  
 (standards.iteh.ai)  
 Full standard:  
<https://standards.iteh.ai/catalog/standards/sist/bc7b2456-3316-44ef-beee-666b22e49837/etsi-ts-138-424-v15.2.0-2019-07>

---

# Foreword

This Technical Specification has been produced by the 3<sup>rd</sup> 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.

**PREVIEW**  
**STANDARD**  
**PREVIEW**  
**(standards.iteh.ai)**  
Full standard:  
<https://standards.iteh.ai/catalog/standards/sist/be7b2456-3316-44ef-beee-666b22e49837/etsi-ts-138-424-v15.2.0-2019-07>

# 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;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

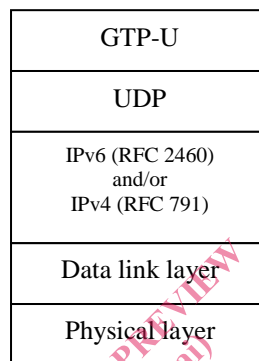
## 4 Data link layer

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.



**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.

**iTeh STANDARD PREVIEW**  
(standards.iteh.ai)  
Full standard:  
<https://standards.iteh.ai/catalog/standards/sist/be7b2456-3316-44ef-beee-666b22e49837/etsi-ts-138-424-v15.2.0-2019-07>



## 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

**iTeh STANDARD PREVIEW**  
 (standards.iteh.ai)  
 Full standard:  
<https://standards.iteh.ai/catalog/standards/sist/be7b2456-3316-44ef-beee-666b22e49837/etsi-ts-138-424-v15.2.0-2019-07>