

ETSI TS 136 464 V13.2.0 (2016-10)



TECHNICAL SPECIFICATION

**LTE;
Evolved Universal Terrestrial
Radio Access Network (E-UTRAN) and Wireless LAN (WLAN);
Xw data transport
(3GPP TS 36.464 version 13.2.0 Release 13)**



Reference

RTS/TSGR-0336464vd20

Keywords

LTE

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 only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

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.

© European Telecommunications Standards Institute 2016.
All rights reserved.

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

Intellectual Property Rights

IPRs essential or potentially essential to the present document 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.

Foreword

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, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 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
Foreword.....	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 Xw 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
5.5 LTE-WLAN Aggregation	7
Annex A (informative): Change history	8
History	9

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 Xw interface for LTE/WLAN Aggregation (LWA).

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 36.300: 'Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2'.
 - [3] 3GPP TS 36.465: 'Evolved Universal Terrestrial Radio Access Network (E-UTRAN) and Wireless LAN (WLAN); Xw interface user plane protocol'.
-

3 Definitions and abbreviations

3.1 Definitions

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

LTE-WLAN Aggregation: Defined in TS 36.300 [2].

LWA bearer: Defined in TS 36.300 [2].

Xw: logical interface between eNB and WT.

WLAN Termination: Defined in TS 36.300 [2].

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].

eNB	E-UTRAN Node
LWA	LTE-WLAN Aggregation
WT	WLAN Termination

4 Data link layer

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

5 Xw interface user plane protocol

5.1 General

The transport layer for data streams over Xw is an IP based Transport. The following figure shows the transport protocol stacks over Xw.

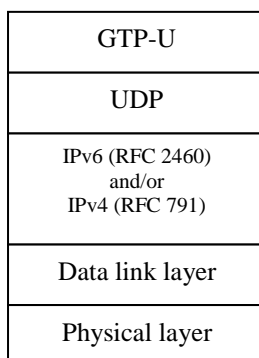


Figure 5.1: Transport network layer for data streams over Xw

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

There is one UL data stream (if flow control is supported) and one DL data stream per E-RAB at the Xw interface.

- The DL data stream is used for DL user data forwarding from the eNB to the WT.
- The UL data stream is used for carrying the UL flow control feedback from the WT to the eNB.

Each data stream is carried on a dedicated transport bearer.

The identity of a transport bearer signalled in the RNL control plane consists of the IP address and the TEID of the corresponding GTP tunnel, allocated by the target node (see TS 29.281 [2]).

5.2 GTP-U

The GTP-U (TS 29.281 [2]) protocol shall be used over the Xw interface between eNB and WT.

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 eNB and the WT over the Xw interface shall support fragmentation and assembly of GTP packets at the IP layer.

The eNB and the WT shall support IPv6 (IETF RFC 2460 [5]) and/or Ipv4 (IETF RFC 791 [6]).

There may be one or several IP addresses in both the eNB and the WT. The packet processing function in the source eNB shall send downstream packets corresponding to a given E-RAB to the target WT IP address (received in XwAP) associated to the DL transport bearer of that particular E-RAB. The packet processing function in the source WT shall

send upstream packets corresponding to a given E-RAB to the target eNB IP address (received in XwAP) associated to the UL transport bearer of that particular E-RAB.

The Transport Layer Address signalled in XwAP messages is a bit string of either

- 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].

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 for based on QoS Class Identifier (QCI)/ Label Characteristics and others E-UTRAN traffic parameters. Traffic categories are implementation-specific and may be determined from the application parameters.

5.5 LTE-WLAN Aggregation

For the LWA bearer option

- the GTP-U (TS 29.281 [2]) protocol over UDP over IP shall be supported as the transport for the downlink user data stream of LWA PDUs and the uplink flow control feedback stream on the Xw interface. The GTP-U PDU includes a RAN Container with flow control information as specified in TS 36.465 [3] which is carried in the GTP-U extension header. The transport bearer is identified by the GTP-U TEID (TS 29.281 [2]) and the IP address of the eNB and WT respectively. There is one UL data stream (if flow control is supported) and there is one DL data stream per E-RAB at the Xw interface:
 - The DL data stream is used for DL user data transmission from the eNB to the WT.
 - The UL data stream is used for UL flow control feedback transmission from the WT to the eNB.
- the packet processing function in the eNB shall send downstream packets corresponding to a given E-RAB to the WT IP address (received in XwAP) associated to the DL transport bearer of that particular E-RAB. The packet processing function in the WT shall send upstream packets corresponding to a given E-RAB to the eNB IP address (received in XwAP) associated to the UL transport bearer of that particular E-RAB.
- in addition, user data forwarding (from WT to eNB) may be performed by eNB providing another GTP-U TEID to receive the DL data forwarded by the WT.

Annex A (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Cat	Subject/Comment	New
2015-08	RAN3#89	R3-151596				Draft skeleton TR	0.0.1
2015-09	RAN3#89 -bis	R3-152213				TR number update	0.0.2
2015-11	RAN3#90	R3-152419				TR number update	0.1.0
2015-11	RAN3#90	R3-152906				Agreements from RAN3#90	0.2.0
2016-01	RAN3#A H	R3-160006				TR number update	1.1.0
2016-02	RAN3#A H	R3-160149				Agreements from RAN3#AH	1.2.0
2016-02	RAN3#91	R3-160157				TR number update	1.3.0
2016-02	RAN3#91	R3-160456				Agreements from RAN3#91	1.4.0
2016-03	71	RP-160436				MCC cleanup, presented for approval in RAN#71	2.0.0
2016-03	71					Upgraded to Rel-13 and placed under change control	13.0.0
2016-06	72	RP-161046	1	1	F	Rapporteur updates – miscellaneous corrections	13.1.0
2016-09	73	RP-161550	5		F	Correction of the LWA PDU type	13.2.0

History

Document history		
V13.0.0	April 2016	Publication
V13.1.0	August 2016	Publication
V13.2.0	October 2016	Publication