

# ETSI TS 136 414 V10.0.0 (2011-01)

---

*Technical Specification*

**LTE;  
Evolved Universal Terrestrial Radio  
Access Network (E-UTRAN);  
S1 data transport  
(3GPP TS 36.414 version 10.0.0 Release 10)**

---



---

Reference

RTS/TSGR-0336414va00

---

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**

Individual copies of the present document can be downloaded from:

<http://www.etsi.org>

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the 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

<http://portal.etsi.org/tb/status/status.asp>

If you find errors in the present document, please send your comment to one of the following services:

[http://portal.etsi.org/chaicor/ETSI\\_support.asp](http://portal.etsi.org/chaicor/ETSI_support.asp)

---

**Copyright Notification**

No part may be reproduced except as authorized by written permission.  
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2011.  
All rights reserved.

**DECT**<sup>TM</sup>, **PLUGTESTS**<sup>TM</sup>, **UMTS**<sup>TM</sup>, **TIPHON**<sup>TM</sup>, the TIPHON logo and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.

**3GPP**<sup>TM</sup> is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

**LTE**<sup>TM</sup> is a Trade Mark of ETSI currently being registered

for the benefit of its Members and of the 3GPP Organizational Partners.

**GSM**<sup>®</sup> 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 (<http://webapp.etsi.org/IPR/home.asp>).

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>.

---

# Contents

Intellectual Property Rights .....	2
Foreword.....	2
Foreword.....	4
1 Scope .....	5
2 References .....	5
3 Definitions, symbols and abbreviations .....	5
3.1 Definitions .....	5
3.2 Abbreviations .....	5
4 Data Link Layer .....	6
5 S1 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

---

## 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.

---

# 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 S1 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 (August 1980): "User Datagram Protocol".
- [4] IETF RFC 2474 (December 1998): "Definition of the Differentiated Services Field (DS Field) in the Ipv4 and Ipv6 Headers".
- [5] IETF RFC 2460 (December 1998): "Internet Protocol, Version 6 (IPv6) Specification".
- [6] IETF RFC 791 (September 1981): "Internet Protocol".
- [7] 3GPP TS 36.401: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Architecture description".

---

# 3 Definitions, symbols 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 [1].

**S1:** interface between an eNB and an EPC, providing an interconnection point between the EUTRAN and the EPC. It is also considered as a reference point.

**E-RAB:** as defined in [7].

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 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 TR 21.905 [1].

eNB	E-UTRAN Node B
EPC	Evolved Packet Core
E-RAB	E-UTRAN Radio Access Bearer

E-UTRA	Evolved UTRA
E-UTRAN	Evolved UTRAN
GTP	GPRS Tunnelling Protocol
IP	Internet Protocol
MME	Mobility Management Entity
TEID	Tunnel Endpoint Identifier
UDP	User Datagram Protocol

---

## 4 Data Link Layer

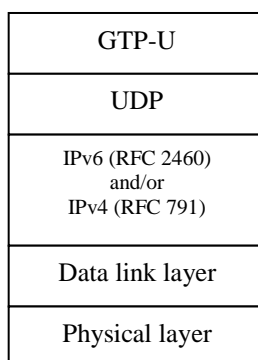
Any data link protocol that fulfils the requirements toward the upper layer may be used.

---

## 5 S1 Interface user plane protocol

### 5.1 General

The transport layer for data streams over S1 is an IP based Transport. The following figure shows the transport protocol stacks over S1.



**Figure 6.1: Transport network layer for data streams over S1**

The GTP-U [2] protocol over UDP over IP shall be supported as the transport for data streams on the S1 interface. The data link layer is as specified in clause 4.

The transport bearer is identified by the GTP-U TEID [2] and the IP address (source TEID, destination TEID, source IP address, destination IP address).

### 5.2 GTP-U

The GTP-U [2] protocol shall be used over the S1 interface toward the EPC.

### 5.3 UDP/IP

The path protocol used shall be UDP [3].

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

The eNB and the EPC shall support fragmentation and assembly of GTP packets at the IP layer.

The eNB and the EPC shall support IPv6 [5] and/or IPv4 [6].

There may be one or several IP addresses in the eNB and in the EPC. The packet processing function in the EPC shall send downstream packets of a given E-RAB to the eNB IP address (received in S1-AP) associated to that particular E-

RAB. The packet processing function in the eNB shall send upstream packets of a given E-RAB to the EPC IP address (received in S1-AP) associated to that particular E-RAB.

The Transport Layer Address signalled in S1-AP messages is a bit string of

- a) 32 bits in case of IPv4 address according to [6]; and
- b) 128 bits in case of IPv6 address according to [5].

## 5.4 Diffserv code point marking

IP Differentiated Services code point marking [4] shall be supported. The mapping between traffic categories and Diffserv code points shall be configurable by O&M based on QoS Class Identifier (QCI) Characteristics and others E-UTRAN traffic parameters. Traffic categories are implementation-specific and may be determined from the application parameters.



---

## Annex A (informative): Change History

TSG #	TSG Doc.	CR	Rev	Subject/Comment	New
38				specification approved at TSG-RAN and placed under change control	8.0.0
39	RP-080078	0001	1	Data link layer proposal	8.1.0
39	RP-080078	0002		Editorial correction on 36.414	8.1.0
40	RP-080302	0003	1	eGTP draft reference for S1 Data Transport	8.2.0
40	RP-080302	0005		Define format for TLA signalled in S1AP messages	8.2.0
42	RP-080845	0006		Correction of invalid references	8.3.0
42	RP-080845	0007		Correction of SAE Bearers	8.3.0
43	RP-090083	0008		Correction on GTP-U version	8.4.0
12/2009	-	-	-	Creation of Rel-9 version based on v8.4.0	9.0.0
12/2010				Creation of Rel-10 version based on v 9.0.0	10.0.0

---

# History

<b>Document history</b>		
V10.0.0	January 2011	Publication