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Technical Specification

**LTE;
Evolved Universal Terrestrial
Radio Access Network (E-UTRAN);
S1 data transport
(3GPP TS 36.414 version 8.3.0 Release 8)**



Reference

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Foreword

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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] GTP-U is the reference; final TS reference required further assessment.
 - [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".
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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.

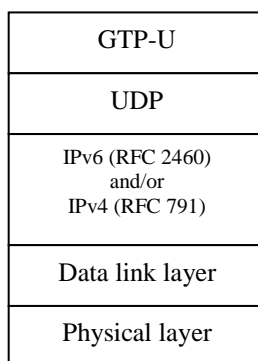


Figure 6.1: Transport network layer for data streams over S1

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].

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

The eNB and 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.

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

| Change history | | | | | | | |
|----------------|-------|-----------|-----|-----|---|-------|-------|
| Date | TSG # | TSG Doc. | CR | Rev | Subject/Comment | Old | New |
| 11.2007 | 38 | RP-070852 | | | specification presented to TSG-RAN for information and approval | | 1.0.0 |
| 12.2007 | 38 | | | | specification approved at TSG-RAN and placed under change control | 1.0.0 | 8.0.0 |
| 03-2008 | 39 | RP-080078 | 001 | 1 | Data link layer proposal | 8.0.0 | 8.1.0 |
| 03-2008 | 39 | RP-080078 | 002 | | Editorial correction on 36.414 | 8.0.0 | 8.1.0 |
| 06-2008 | 40 | RP-080302 | 003 | 1 | eGTP draft reference for S1 Data Transport | 8.1.0 | 8.2.0 |
| 06-2008 | 40 | RP-080302 | 005 | | Define format for TLA signalled in S1AP messages | 8.1.0 | 8.2.0 |
| 12-2008 | 42 | RP-080845 | 006 | | Correction of invalid references | 8.2.0 | 8.3.0 |
| 12-2008 | 42 | RP-080845 | 007 | | Correction of SAE Bearers | 8.2.0 | 8.3.0 |

History

| Document history | | |
|-------------------------|---------------|-------------|
| V8.2.0 | November 2008 | Publication |
| V8.3.0 | January 2009 | Publication |
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