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Technical Specification

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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:

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- 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.

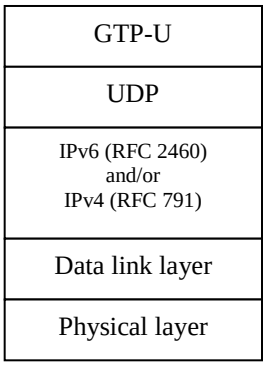

Figure 6.1: Transport network layer for data streams over S1

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

History

Document history		
V8.2.0	November 2008	Publication
V8.3.0	January 2009	Publication
V8.4.0	April 2009	Publication