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Technical Specification

**LTE;
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Radio Access Network (E-UTRAN);
M1 data transport
(3GPP TS 36.445 version 9.2.1 Release 9)**



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Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

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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 over the E-UTRAN M1 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] IETF RFC3376, 'Internet Group Management Protocol, Version 3', October 2002.
 - [8] IETF RFC3810, 'Multicast Listener Discovery Version 2 (MLDv2) for IPv6', June 2004.
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3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 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 TR 21.905 [1].

M1: interface between an eNB and an EPC for MBMS data delivery, providing an interconnection point between the EUTRAN and the EPC. M1 is a user plane interface between E-UTRAN and EPC. It is also considered as a reference point.

3.2 Symbols

For the purposes of the present document, the following symbols apply:

Symbol format (EW)

<symbol> <Explanation>

3.3 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].

DiffServ	Differentiated Service
eNB	E-UTRAN Node B
EPC	Evolved Packet Core
E-UTRA	Evolved UTRA
E-UTRAN	Evolved UTRAN
GTP	GPRS Tunnelling Protocol
IP	Internet Protocol
MBMS	Multimedia Broadcast Multicast Service
TCP	Transmission Control Protocol
TEID	Tunnel Endpoint Identifier
UDP	User Datagram Protocol

4 Data Link Layer

The support of any suitable data link Layer technique - like Ethernet, etc ...- techniques shall not be prevented.

5 M1 interface user plane protocol

5.1 General

The transport layer for MBMS data streams over M1 is an IP based Transport. The following figure shows the transport protocol stacks over M1.

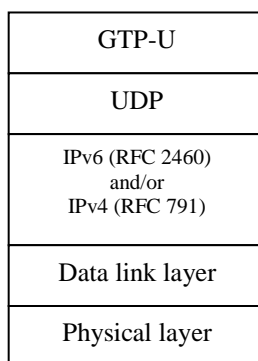


Figure 5.1-1: Transport network layer for MBMS data streams over M1

The GTP-U (TS 29.281 [2]) protocol over UDP over IP shall be supported as the transport for MBMS data streams on the M1 interface. The data link layer is as specified in clause 4.

On IP multicast mode, the transport bearer is identified by the GTP-U TEID (TS 29.281 [2]) and the IP multicast address (source TEID, IP address of multicast source, IP multicast address).

5.2 GTP-U

The GTP-U (TS 29.281 [2]) protocol shall be used over the M1 interface toward the EPC.

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].

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

The eNB and EPC shall support IPv6 (IETF RFC 2460 [5]) and/or IPv4 (IETF RFC 791 [6]).

IP multicast (IETF RFC 3376 [7], [8]) shall be supported for point-to-multipoint delivery of MBMS data streams for multi-cell transmission.

The packet processing function in the EPC shall send MBMS data of a given MBMS bearer to the TNL IP multicast address associated to that particular MBMS bearer.

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 QoS Class Identifier (QCI) Characteristics and other 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
2009-10				First draft	0.0.0
2009-11				Capture the agreements in RAN3#66	1.0.0
2009-12				Presented for approval at RAN#46	2.0.0
46	RP-091255			Approved at RAN#46	9.0.0
47	RP-100226	0001	2	Clean up of unicast related text	9.1.0
48	RP-100597	0002		Correction and Completion of M1	9.2.0
SP-49	SP-100629			Clarification on the use of References (TS 21.801 CR#0030)	9.2.1

History

Document history		
V9.0.0	February 2010	Publication
V9.1.0	April 2010	Publication
V9.2.0	September 2010	Publication (Withdrawn)
V9.2.1	May 2011	Publication