3GPP TS 36.442 V16.0.0 (2020-07)

Technical Specification

3rd Generation Partnership Project;

Technical Specification Group Radio Access Network;

Evolved Universal Terrestrial Radio Access Network (E-UTRAN);

Signalling Transport for interfaces supporting Multimedia Broadcast Multicast Service (MBMS) within E-UTRAN

(Release 16)

* *

The present document has been developed within the 3rd Generation Partnership Project (3GPP TM) and may be further elaborated for the purposes of 3GPP.  
The present document has not been subject to any approval process by the 3GPPOrganizational Partners and shall not be implemented.  
This Specification is provided for future development work within 3GPPonly. The Organizational Partners accept no liability for any use of this Specification.  
Specifications and reports for implementation of the 3GPP TM system should be obtained via the 3GPP Organizational Partners' Publications Offices.

Keywords

LTE, MBMS, radio

***3GPP***

Postal address

3GPP support office address

650 Route des Lucioles - Sophia Antipolis

Valbonne - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Internet

http://www.3gpp.org

***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.

© 2020, 3GPP Organizational Partners (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC).

All rights reserved.

UMTS™ is a Trade Mark of ETSI registered for the benefit of its members

3GPP™ is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners  
LTE™ is a Trade Mark of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners

GSM® and the GSM logo are registered and owned by the GSM Association

Contents

Foreword [4](#__RefHeading___Toc478158881)

1 Scope [5](#__RefHeading___Toc478158882)

2 References [5](#__RefHeading___Toc478158883)

3 Definitions and abbreviations [5](#__RefHeading___Toc478158884)

3.1 Definitions [5](#__RefHeading___Toc478158885)

3.2 Abbreviations [5](#__RefHeading___Toc478158886)

4 M2 Interface [6](#__RefHeading___Toc478158887)

4.1 M2 signalling bearer [6](#__RefHeading___Toc478158888)

4.1.1 Functions and protocol stack [6](#__RefHeading___Toc478158889)

4.2 Data link layer [6](#__RefHeading___Toc478158890)

4.3 IP layer [6](#__RefHeading___Toc478158891)

4.4 Transport layer [6](#__RefHeading___Toc478158892)

5 M3 Interface [7](#__RefHeading___Toc478158893)

5.1 M3 signalling bearer [7](#__RefHeading___Toc478158894)

5.1.1 Functions and protocol stack [7](#__RefHeading___Toc478158895)

5.2 Data link layer [7](#__RefHeading___Toc478158896)

5.3 IP layer [7](#__RefHeading___Toc478158897)

5.4 Transport layer [8](#__RefHeading___Toc478158898)

Annex A (informative): Change history [9](#__RefHeading___Toc478158899)

# 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 signalling transport to be used across M2 and M3 interfaces. M2 interface is a logical interface between the eNB and the MCE. M3 interface is a logical interface between the MCE and the MME. The present document describes how the M2-AP signalling messages are transported over M2, and how the M3-AP signalling messages are transported over M3.

# 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] IETF RFC 2460 (1998-12): "Internet Protocol, Version 6 (IPv6) Specification".

[3] IETF RFC 791 (1981-09): "Internet Protocol".

[4] IETF RFC 2474 (1998-12): "Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers".

[5] IETF RFC 4960 (2007-09): "Stream Control Transmission Protocol".

# 3 Definitions 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].

**M2:** E-UTRAN internal control plane interface between an eNB and an MCE, It is also considered as a reference point.

**M3:** Control plane interface between an E-UTRAN (MCE) and MME. It is also considered as a reference point.

## 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

DiffServ Differentiated Service

IP Internet Protocol

MME Mobility Management Entity

PPP Point to Point Protocol

SCTP Stream Control Transmission Protocol

# 4 M2 Interface

## 4.1 M2 signalling bearer

### 4.1.1 Functions and protocol stack

M2 signalling bearer provides the following functions:

- Provision of reliable transfer of M2-AP message over M2 interface

- Provision of networking and routeing function

- Provision of redundancy in the signalling network

The protocol stack for M2 signalling bearer is shown in figure 4.1.1 and details on each protocol are described in the following clauses.



Figure 4.1.1: M2 signalling bearer protocol stack

The transport network layer is based on IP transport, comprising SCTP on top of IP.

## 4.2 Data link layer

The support of any suitable data link layer protocol, e.g. PPP, Ethernet, etc., shall not be prevented.

## 4.3 IP layer

The eNB and MCE shall support IPv6 (IETF RFC 2460 [2]) and/or IPv4 (IETF RFC 791 [3]).

The IP layer of M2 only supports point-to-point transmission for delivering M2-AP messages.

The eNB and MCE shall support the Diffserv Code Point marking as described in IETF RFC 2474 [4].

## 4.4 Transport layer

SCTP (IETF RFC 4960 [5]) shall be supported as the transport layer of M2 signalling bearer. The Payload Protocol Identifier assigned by IANA to be used by SCTP for the application layer protocol M2-AP is 43.

SCTP refers to the Stream Control Transmission Protocol developed by the Sigtran working group of the IETF for the purpose of transporting various signalling protocols over IP network.

There shall be only one SCTP association established between one MCE and eNB pair.

The eNB shall establish the SCTP association. The SCTP Destination Port number value assigned by IANA to be used for M2-AP is 36443.

Within the SCTP association established between one MCE and eNB pair:

- a single pair of stream identifiers shall be reserved for the use of M2-AP elementary procedures.

Transport network redundancy may be achieved by SCTP multi-homing between two end-points, of which one or both is assigned with multiple IP addresses. SCTP end-points shall support a multi-homed remote SCTP end-point. For SCTP endpoint redundancy an INIT may be sent from MCE or eNB, at any time for an already established SCTP association, which shall be handled as defined in IETF RFC 4960 [5] in § 5.2.

# 5 M3 Interface

## 5.1 M3 signalling bearer

### 5.1.1 Functions and protocol stack

M3 signalling bearer provides the following functions:

- Provision of reliable transfer of M3-AP message over M3 interface

- Provision of networking and routeing function

- Provision of redundancy in the signalling network

The protocol stack for M3 signalling bearer is shown in figure 5.1.1 and details on each protocol are described in the following clauses.



Figure 5.1.1: M3 signalling bearer protocol stack

The transport network layer is based on IP transport, comprising SCTP on top of IP.

## 5.2 Data link layer

The support of any suitable data link layer protocol, e.g. PPP, Ethernet, etc., shall not be prevented.

## 5.3 IP layer

The E-UTRAN and MME shall support IPv6 (IETF RFC 2460 [2]) and/or IPv4 (IETF RFC 791 [3]).

The IP layer of M3 only supports point-to-point transmission for delivering M3-AP messages.

The MCE and MME shall support the Diffserv Code Point marking as described in IETF RFC 2474 [4].

## 5.4 Transport layer

SCTP (IETF RFC 4960 [5]) shall be supported as the transport layer of M3 signalling bearer. The Payload Protocol Identifier assigned by IANA to be used by SCTP for the application layer protocol M3-AP is 44.

SCTP refers to the Stream Control Transmission Protocol developed by the Sigtran working group of the IETF for the purpose of transporting various signalling protocols over IP network.

There shall be only one SCTP association established between one MCE and MME pair.

The MCE shall establish the SCTP association. The SCTP Destination Port number value assigned by IANA to be used for M3-AP is 36444.

Within the SCTP association established between one MCE and MME pair:

- a single pair of stream identifiers shall be reserved for the use of M3-AP elementary procedures.

Transport network redundancy may be achieved by SCTP multi-homing between two end-points, of which one or both is assigned with multiple IP addresses. SCTP end-points shall support a multi-homed remote SCTP end-point. For SCTP endpoint redundancy an INIT may be sent from MME or MCE, at any time for an already established SCTP association, which shall be handled as defined in IETF RFC 4960 [5] in § 5.2.

Annex A (informative):  
Change history

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **TSG #** | **TSG Doc.** | **CR** | **Rev** | **Subject/Comment** | **New** |
| 2009-10 |  |  |  | Update to take into account comments raised at RAN3 #65bis | 0.0.2 |
| 2009-12 |  |  |  | Stepping the version to 2.0.0 for approval at RAN#46 | 2.0.0 |
| 46 | RP-091210 |  |  | Approved at RAN#46 | 9.0.0 |
| 47 | RP-100226 | 0001 | 2 | Editorial corrections | 9.1.0 |
| 2010-12 |  |  |  | Created Rel-10 version based on v. 9.1.0 | 10.0.0 |
| SP-49 | SP-100629 |  |  | Clarification on the use of References (TS 21.801 CR#0030) | 10.0.1 |
| 52 | RP-110685 | 0002 |  | Reference review outcome in TS 36.442 | 10.1.0 |
| 53 | RP-111195 | 0003 |  | Introduction of SCTP PPI and Destination Port number for MBMS | 10.2.0 |
| 2012-09 |  |  |  | Update to Rel-11 version (MCC) | 11.0.0 |
| 2014-09 |  |  |  | Update to Rel-12 version (MCC) | 12.0.0 |
| 2015-12 |  |  |  | Update to Rel-13 version (MCC) | 13.0.0 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
| 2017-03 | SA#75 |  |  |  |  | Promotion to Release 14 without technical change | 14.0.0 |
| 2018-09 | RP#81 | - | - | - | - | Update to Rel-15 version (MCC) | 15.0.0 |
| 2020-07 | SA#88-e | - | - | - | - | Update to Rel-16 version (MCC) | 16.0.0 |