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3GPP-(Technical Speciation Group Radio Access Network; Evolved Universal Terrestrial Radio Access Network (E-UTRAN); SLm interface signalling transport)

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Technical Specification

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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

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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 the SLm interface. The SLm interface is a logical interface between the LMU and the E-SMLC in the E-UTRAN core network. The present document describes how the SLmAP signalling messages are transported over SLm.

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].

SLm: interface between an LMU and an E-SMLC, providing an interconnection point between the LMU and the E-SMLC. It is also considered as a reference point.

SLmAP: Reference point for the application protocol between LMU and E-SMLC.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply.

E-SMLC	E-UTRAN Serving Mobile Location Centre
DiffServ	Differentiated Service
IP	Internet Protocol
MME	Mobility Management Entity
PPP	Point to Point Protocol
SCTP	Stream Control Transmission Protocol
SLmAP	SLm Application Protocol
UTDOA	Uplink Time Difference of Arrival

4 SLm signalling bearer

4.1 Functions and protocol stack

SLm signalling bearer provides the following functions:

- Provision of reliable transfer of SLmAP message over SLm interface.
- Provision of networking and routeing function
- Provision of redundancy in the signalling network
- Support for flow control and congestion control

The protocol stack for SLm signalling bearer is shown in figure 4.1 and details on each protocol are described in the following clauses.

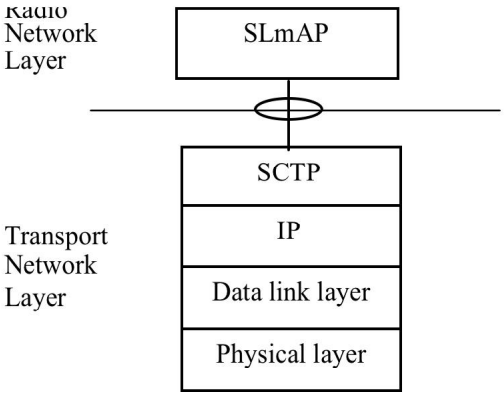

Figure 4.1: SLm signalling bearer protocol stack

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

5 Data link layer

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

6 IP layer

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

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

The LMU and E-SMLC shall support the Diffserv Code Point marking as described in IETF RFC 2474 [4].

7 Transport layer

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

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 E-SMLC and LMU pair.

The LMU shall establish the SCTP association. The SCTP Destination Port number value assigned by IANA to be used for SLmAP is TBD.

Within the SCTP association established between one E-SMLC and LMU pair:

- a single pair of stream identifiers shall be reserved for the sole use of SLmAP elementary procedures that utilize non UE-associated signalling.
- At least one pair of stream identifiers shall be reserved for the sole use of SLmAP elementary procedures that utilize UE-associated signalling. However, a few pairs (i.e. more than one) should be reserved.
- A single UE-associated signalling shall use one SCTP stream and the stream should not be changed during the communication of the UE-associated signalling.

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 E-SMLC, at any time for an already established SCTP association, which shall be handled as defined in IETF RFC 4960 [5] in subclause 5.2.

The SCTP congestion control may, using an implementation specific mechanism, initiate higher layer protocols to reduce the signalling traffic at the source and prioritise certain messages.

Annex A (informative): Change History

Change history						
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	New
2012-12	58	RP-121768			Approved in RAN#58 and put under change control	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
2018-06	SA#80	-	-	-	-	Promotion to Release 15 without technical change	15.0.0