ETSI TS 129 276 V13.0.0 (2016-01)

TECHNICAL SPECIFICATION

Universal Mobile Telecommunications System (UMTS);
LTE;
3GPP Evolved Packet System (EPS);
Optimized handover procedures and protocols between E-UTRAN access and cdma2000 HRPD Access;
Stage 3
(3GPP TS 29.276 version 13.0.0 Release 13)

Reference

RTS/TSGC-0429276vd00

Keywords

LTE,UMTS

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

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

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

The present document can be downloaded from:
http://www.etsi.org/standards-search

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at
http://portal.etsi.org/tb/status/status.asp

If you find errors in the present document, please send your comment to one of the following services:
https://portal.etsi.org/People/CommiteeSupportStaff.aspx

Copyright Notification

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (https://ipr.etsi.org/).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

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

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp.

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

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:

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 stage 3 of the Evolved Packet System S101and S121 reference points between the MME and the HRPD Access Network. The S101 interface supports procedures for Pre-Registration, Session Maintenance and Active handoffs between E-UTRAN and HRPD networks. The S121 interface supports procedures for RIM information exchange between the MME and the HRPD Access Network.

It also specifies the S103 interface between the Serving GW and HSGW. This User Plane interface is used to forward DL data to minimize packet losses in mobility from E-UTRAN to HRPD. Signalling procedures on the S101 interface are used to set up tunnels on the S103 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 23.402: "Architecture enhancements for non-3GPP accesses".

[3] IETF RFC 3232: "Assigned Numbers".

[4] IETF RFC 2784: "Generic Routing Encapsulation (GRE)".

[5] IETF RFC 2890: "Key and Sequence Number Extensions to GRE".

[6] 3GPP TS 29.274: "Evolved GPRS Tunnelling Protocol for Control Plane (GTPv2-C); Stage 3".

[7] 3GPP2 C.S0024-B: "cdma2000 High Rate Packet Data Air Interface Specification".

[8] 3GPP TS 23.007: "Restoration procedures".

[9] 3GPP2 C.S0087-0 v2.0: "E-UTRAN - HRPD and CDMA2000 1x Connectivity and Interworking: Air Interface Aspects".

[10] 3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3".

[11] 3GPP TS 33.402: "3GPP System Architecture Evolution: Security Architecture".

[12] 3GPP TS 36.413: "Evolved Universal Terrestrial Radio Access (E-UTRA) ; S1 Application Protocol (S1AP)".

[13] 3GPP TS 24.008: " Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".

[14] 3GPP TS 29.280: "3GPP EPS Sv interface (MME to MSC) for SRVCC".

[15] 3GPP TS 48.018: "General Packet Radio Service (GPRS); Base Station System (BSS) - Serving GPRS Support Node (SGSN); BSS GPRS protocol (BSSGP)".

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].

HRPD Access: Combination of the eAN - PCF of the cdma2000 access

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].

AN	Access Network
eAN	enhanced AN
eNodeB	enhanced Node B
E-UTRAN	Enhanced UMTS Terrestial Radio Access Network
GRE	Generic Routing Encapsulation
GW	Gateway
HO	HandOver
HRPD	High Rate Packet Data
HSGW	HRPD Serving GateWay
IMSI	International Mobile Station Identity
IP	Internet Protocol
MME	Mobility Management Entity
PCF	Packet Control Function
PDN	Packet data Network
PMIP	Proxy Mobile IP
RIM	RAN Information Management
TEID	Tunnel End Point Identifier
UDP	User Datagram Protocol
VS	Vendor Specific

4 General

The S101 and S121 reference points are defined between the MME and the HRPD access, enabling interactions between E-UTRAN Access and cdma2000 HRPD Access. The S101 interface is required to perform procedures related to optimise HO from the E-UTRAN Access to cdma2000 HRPD Access to allow for pre-registration and handover signalling with the target system. The S121 interface is required to perform procedures related to RIM information exchange between the E-UTRAN Access and cdma2000 HRPD Access.

The S103 interface is defined between the Serving GW and HSGW and supports the forwarding of DL data during mobility from E-UTRAN to HRPD. Signalling procedures on the S101 interface are used to set up tunnels on the S103 interface.

The requirements for these interfaces are defined in 3GPP TS 23.402 [2].

The protocol stack used for the S101 and S121 interfaces shall be based on GTPv2-C, see 3GPP TS 29.274 [6] Figure 4.2.0-1.

The UDP header and port numbers definitions shall be as defined in GTPv2-C, see 3GPP TS 29.274 [6] section 4. 2.1.

The IP header and IP addresses definitions shall be as defined in GTPv2-C, see 3GPP TS 29.274 [6] section 4.2.2.

Layer 1 and Layer 2 requirements shall as defined in GTPv2-C, see 3GPP TS 29.274 [6] sections 4.2.3 and 4.2.4.

5 Transmission Order and Bit Definitions

Transmission Order and Bit Definitions shall be as defined in GTPv2-C, see 3GPP TS 29.274 [6] section 4.3.

6 S101 Message Header

6.1 Introduction

The S101 Message Header is conformant to the GTPv2-C Message Header, see 3GPP TS 29.274 [6] section 5. All S101 messages shall have a header that includes specific parameters. The following list of header parameters are defined for the S101 interface:

- Version
- Flags (T = TEID Included)
- Message Type
- Length

6.2 S101 Message Header

The S101 header is a variable length header. The minimum length of the S101 header is eight octets. Space has been reserved for four flags that may be used in the future to signal the presence of additional optional header fields or utilities.

- Bit 4 (the T bit) may be set to one to indicate that a TEID is present in the header, as per 3GPP TS 29.274 [6]. The T bit shall be set to zero to indicate that the TEID field shall not be present in any message sent on the S101 interface.

If the header fields do not occupy a full eight octets, then spare octets shall be added after the last valid field in the S101 header to complete eight octets. Spare octets and bits shall be set to zero.

Always present fields:

- Version field: This field is used to determine the version of the S101 protocol. The version number shall be set to '010'.
- Message Type: This field indicates the type of S101 message. The valid values of the message type are defined in clause 7.1. Note that values chosen for Message Type shall be coordinated with and shall not overlap the Message Type values chosen for GTPv2-C in 3GPP TS 29.274 [6].
- Length: This field indicates the length in octets of the payload, i.e. the rest of the packet following the mandatory part of the S101 header (that is the first 4 octets).
- Sequence Number: This field enables the target system to identify any missing receipt of messages and is used also for acknowledgement of messages.

Octets	Bits 8	7	6	5	4	3	2	1
1	Version=010			(*)	T=0	(*)	(*)	(*)
2	Message Type							
3	Length (1st Octet)							
4	Length (2nd Octet)							
5	Sequence Number (1st Octet)							
6	Sequence Number (2nd Octet)							
7	Sequence Number (3rd Octet)							
8	Spare							

NOTE 0: (*) This bit is a spare bit. It shall be sent as '0'. The receiver shall not evaluate this bit.

Figure 6.2-1: Layout of the S101 Message Header

6A S121 Message Header

6A.1 Introduction

The S121 Message Header is conformant to the GTPv2-C Message Header, see 3GPP TS 29.274 [6] section 5. All S121 messages shall have a header that includes specific parameters. The following header parameters are defined for the S121 interface:

- Version
- Flags (T = TEID Included)
- Message Type
- Length

6A.2 S121 Message Header

The S121 header is a variable length header. The minimum length of the S121 header is eight octets. Space has been reserved for four flags that may be used in the future to signal the presence of additional optional header fields or utilities.

- Bit 4 (the T bit) indicates whether a TEID is present in the header, as per 3GPP TS 29.274 [6]. The T bit shall be set to zero to indicate that the TEID field shall not be present in any message sent on the S121 interface.

If the header fields do not occupy a full eight octets, then spare octets shall be added after the last valid field in the S121 header to complete eight octets. Spare octets and bits shall be set to zero.

Always present fields:

- Version field: This field is used to determine the version of the S121 protocol. The version number shall be set to '010'.
- Message Type: This field indicates the type of S121 message. The valid values of the message type are defined in clause 7A.1. Note that values chosen for Message Type shall be coordinated with and shall not overlap the Message Type values chosen for GTPv2-C in 3GPP TS 29.274 [6].
- Length: This field indicates the length in octets of the payload, i.e. the rest of the packet following the mandatory part of the S121 header (that is the first 4 octets).
- Sequence Number: This field enables the target system to identify any missing receipt of messages and is used also for acknowledgement of messages.