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Evolved Universal Terrestrial Radio Access Network (E-UTRAN) and Wireless LAN (WLAN); Xw signalling transport

(Release 13)

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Technical Specification

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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 Xw interface. The Xw interface is a logical interface between the eNB and the WT. The present document describes how the Xw-AP signalling messages are transported over Xw.

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, 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].

Xw: logical interface between eNB and WT.

3.2   Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP 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 3GPP TR 21.905 [1].

IANA	Internet Assigned Numbers Authority
IETF	Internet Engineering Task Force
PPP	Point-to-Point Protocol
RFC	Request for Comments
SCTP	Stream Control Transmission Protocol
WT	WLAN Termination

4 Xw signalling bearer

4.1 Function and protocol stack

Xw signalling bearer provides the following functions:

- Provision of reliable transfer of Xw-AP message over Xw 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 Xw Signalling Bearer is shown in figure 4.1-1 and details on each protocol are described in the following sections.
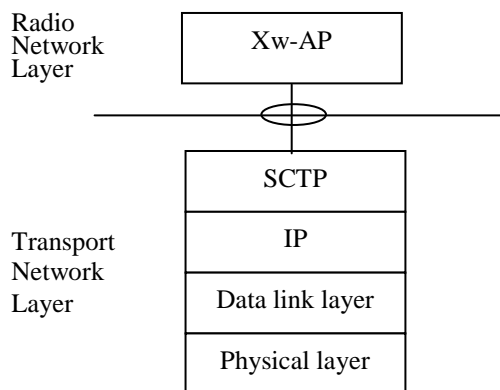

Figure 4.1-1: Xw signalling bearer protocol stack

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 eNB shall support Ipv6 (IETF RFC 2460 [2]) and/or Ipv4 (IETF RFC 791 [3]).

The IP layer of Xw only supports point-to-point transmission for delivering Xw-AP message.

The eNB 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 Xw signalling bearer. The Payload Protocol Identifier assigned by IANA to be used by SCTP for the application layer protocol XwAP is 59.

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 eNB and WT pair.

The eNB shall establish the SCTP association. The SCTP Destination Port Number value assigned by IANA to be used for XwAP is 36462.

Within the SCTP association established between an eNB and WT pair;

- A single pair of stream identifiers shall be reserved for the sole use of XwAP elementary procedures that utilize non UE-associated signalling.

- At least one pair of stream identifiers shall be reserved for the sole use of XwAP 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 endpoints, of which one or both is assigned with multiple IP addresses. SCTP endpoints shall support a multi-homed remote SCTP endpoint. For SCTP endpoint redundancy an INIT may be sent from WT or eNB, at any time for an already established SCTP association, which shall be handled as defined in IETF RFC 4960 [5] in sub-clause 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**	**Cat**	**Subject/Comment**	**New**
2015-10	RAN3#89bis	R3-152078				Xw signaling support	0.1.0
2015-10	RAN3#89bis	R3-152246				Xw_signaling support	0.1.0
2015-10	RAN3#89bis	R3-152247				Draft_TS36462_Update	0.1.0
2015-11	RAN3#90	R3-152417				Draft_TS36462_Update	0.2.0
2015-11	RAN3#90	R3-152774				Draft_TS36462_Update	0.3.0
2015-11	RAN#70	RP-151865				Presentation Specification to TSG RAN#70	1.0.0
2016-01	RAN3# Adhoc NB-IOT	R3-160004				Editorial update: change "Xw signaling support" to "Xw signaling transport"	1.1.0
2016-01	RAN3# Adhoc NB-IOT	R3-160123				Cover page update	1.2.0
2016-02	RAN3#91	R3-160155				Version update	1.3.0
2016-03	RAN#71	RP-160518				MCC clean up and version update	2.0.0
2016-03	RAN#71					Upgraded to Rel-13 and placed under change control	13.0.0