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TECHNICAL SPECIFICATION

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Evolved Universal Terrestrial
Radio Access Network (E-UTRAN);
X2 general aspects and principles
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1 Scope.

The present document is an introduction to the TSG RAN TS 36.42x series of UMTS Technical Specifications that define the X2 interface. It is an interface for the interconnection of two E-UTRAN NodeB (eNB) components and an E-UTRAN NodeB (eNB) and an E-UTRAN gNodeB (en-gNB) within the Evolved Universal Terrestrial Radio Access Network (E-UTRAN) architecture (TS 36.401 [2]).

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.
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[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 36.401: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Architecture description".

[3] 3GPP TS 36.421: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 layer 1".

[4] 3GPP TS 36.422: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 signaling transport".

[5] 3GPP TS 36.423: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 application protocol (X2AP)".

[6] 3GPP TS 36.424: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 data transport".

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

[8] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA), Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2".

[9] 3GPP TS 37.340: "Evolved Universal Terrestrial Radio Access (E-UTRA) and NR; Multi-connectivity; Stage 2".

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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].

Dual Connectivity: Defined in TS 36.300 [8].

EN-DC: Defined in TS 37.340 [9].

en-gNB: Defined in TS 37.340 [9].

E-RAB: Defined in TS 36.401 [2].

X2 GW: Defined in TS 36.300 [8].

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].

ECM	EPS Connection Management
E-RAB	E-UTRAN Radio Access Bearer
MeNB	Master eNB
SeNB	Secondary eNB
X2-C	X2 Control plane
X2 GW	X2 GateWay

4 General aspects

4.1 Introduction

The interface allowing to interconnect eNBs with each other is referred to as the X2 interface.

4.2 X2 interface general principles

The general principles for the specification of the X2 interface are as follows:

- the X2 interface should be open;
- the X2 interface shall support the exchange of signalling information between two eNBs, in addition the interface shall support the forwarding of PDUs to the respective tunnel endpoints;
- from a logical standpoint, the X2 is a point-to-point interface between two eNBs within the E-UTRAN. A point-to-point logical interface should be feasible even in the absence of a physical direct connection between the two eNBs.

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4.3 X2 interface specification objectives

4.3.1 General

The X2 interface specifications shall facilitate the following:

- inter-connection of eNBs supplied by different manufacturers;
- inter-connection of eNBs and en-gNBs in the context of EN-DC (see TS 37.340 [9]);
- support of continuation between eNBs of the E-UTRAN services offered via the S1 interface;
- separation of X2 interface Radio Network functionality and Transport Network functionality to facilitate introduction of future technology.

4.3.2 Addressing of eNBs over the X2 interface

-

4.4 X2 interface capabilities

4.4.1 Radio application related signalling

The X2 interface provides capability to support radio interface mobility and Dual Connectivity either between eNBs or between eNBs and en-gNBs (see TS 37.340 [9]), of UEs having a connection with E-UTRAN.

4.4.2 X2 tunnels

4.5 X2 interface characteristics

4.5.1 Uses of SCTP

4.5.1.1 General

The SCTP (IETF RFC 4960 [7]) is used to support the exchange of X2 Application Protocol (X2AP) signalling messages between two eNBs

A single SCTP association per X2-C interface instance shall be used, except when the X2 GW is used.

Only when the X2 GW is used to connect one eNB to one or more specific eNB(s), all X2-C interface instances from that eNB to the relevant eNB(s) are carried over the same SCTP association from that eNB to the X2 GW, and over separate SCTP association(s) from the X2 GW to the relevant eNB(s).

For X2-C interface instance(s) over one SCTP association one pair of stream identifiers shall be used for X2-C common procedures and only a few pairs of stream identifiers should be used for X2-C dedicated procedures.

Source-eNB communication context identifiers that are assigned by the source-eNB for X2-C dedicated procedures, and target-eNB communication context identifiers that are assigned by the target-eNB for X2-C dedicated procedures, shall be used to distinguish UE specific X2-C signalling transport bearers. The communication context identifiers are conveyed in the respective X2AP messages.

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5 Functions of the X2 interface

5.1 Function list

The list of functions on the X2 interface is the following:

- Intra LTE-Access-System Mobility Support for ECM-CONNECTED UE:
  - Context transfer from source eNB to target eNB;
  - Control of user plane transport bearers between source eNB and target eNB;
  - Handover cancellation;
  - UE context release in source eNB;
  - Dual Connectivity.
- Load Management
- Inter-cell Interference Coordination
  - Uplink Interference Load Management;
  - Downlink interference avoidance.