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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:

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- 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.

Introduction

The present document is part of a TS-family covering the 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication management; as identified below:

32.401 Performance Management (PM); Concept and requirements

52.402 Performance Management (PM); Performance measurements – GSM

32.404 Performance Management (PM); Performance measurements - Definitions and template

32.405 Performance Management (PM); Performance measurements Universal Terrestrial Radio Access Network (UTRAN)

32.406 Performance Management (PM); Performance measurements Core Network (CN) Packet Switched (PS) domain

32.407 Performance Management (PM); Performance measurements Core Network (CN) Circuit Switched (CS) domain

32.408 Performance Management (PM); Performance measurements Teleservice

32.409 Performance Management (PM); Performance measurements IP Multimedia Subsystem (IMS)

32.425 Performance Management (PM); Evolved Performance measurements Universal Terrestrial Radio Access Network (E-UTRAN)

32.426 Performance Management (PM); Evolved Packet Core (EPC)

The present document is part of a set of specifications, which describe the requirements and information model necessary for the standardised Operation, Administration and Maintenance (OA&M) of a multi-vendor E-UTRAN and EPC system.

During the lifetime of an E-UTRAN, its logical and physical configuration will undergo changes of varying degrees and frequencies in order to optimise the utilisation of the network resources. These changes will be executed through network configuration management activities and/or network engineering, see TS 32.600 [3].

Many of the activities involved in the daily operation and future network planning of an E-UTRAN require data on which to base decisions. This data refers to the load carried by the network and the grade of service offered. In order to produce this data performance measurements are executed in the NEs, which comprise the network. The data can then be transferred to an external system, e.g. an Operations System (OS) in TMN terminology, for further evaluation. The purpose of the present document is to describe the mechanisms involved in the collection of the data and the definition of the data itself.

Annex B of TS 32.404 helps in the definition of new performance measurements that can be submitted to 3GPP for potential adoption and inclusion in the present document. Annex B of TS 32.404 discusses a top-down performance measurement definition methodology that focuses on how the end-user of performance measurements can use the measurements.

1 Scope

The present document describes the measurements for E-UTRAN.

TS 32.401 [5] describes Performance Management concepts and requirements.

The present document is valid for all measurement types provided by an implementation of an E-UTRAN.

Only measurement types that are specific to E-UTRAN are defined within the present documents. Vendor specific measurement types used in E-UTRAN are not covered. Instead, these could be applied according to manufacturer's documentation.

Measurements related to "external" technologies (such as ATM or IP) as described by "external" standards bodies (e.g. ITU-T or IETF) shall only be referenced within this specification, wherever there is a need identified for the existence of such a reference.

The definition of the standard measurements is intended to result in comparability of measurement data produced in a multi-vendor network, for those measurement types that can be standardised across all vendors' implementations.

The structure of the present document is as follows:

- Header 1: Network Element (e.g. measurements related to eNodeB);
- Header 2: Measurement function (e.g. RRC connection setup related measurements);
- Header 3: Measurements.

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 and/or edition number or version number) 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 TS 32.101: "Telecommunication management; Principles and high level requirements".

[2] 3GPP TS 32.102: "Telecommunication management; Architecture".

[3] 3GPP TS 32.600: "Telecommunication management; Configuration Management (CM); Concept and high-level requirements".

[4] Void.

[5] 3GPP TS 32.401: "Telecommunication management; Performance Management (PM); Concept and requirements".

[6] 3GPP TS 32.404: "Performance Management (PM); Performance measurements - Definitions and template".

[7] 3GPP TS 32.762: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN) Network Resource Model (NRM) Integration Reference Point (IRP): Information Service (IS)".

[8] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC) protocol specification".

[9] 3GPP TS 36.413: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)".

[10] 3GPP TS 36.423: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 application protocol (X2AP)".

[11] 3GPP TS 36.314: "Evolved Universal Terrestrial Radio Access (E-UTRA); Layer 2 – Measurements".

[12] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA); and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2".

[13] 3GPP TS 32.450: "Telecommunication management; Key Performance Indicators (KPI) for E-UTRAN: Definitions".

[14] 3GPP TS 36.304: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode".

[15] 3GPP TS 32.522: "Technical Specification Group Services and SystemAspects; Telecommunication management; Self-Organizing Networks (SON) Policy Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".

[16] 3GPP TS 36.321: "Evolved Universal Terrestrial Radio Access (E-UTRA) Medium Access Control (MAC) protocol specification".

[17] 3GPP TS 23.272, "Circuit Switched (CS) fallback in Evolved Packet System (EPS); Stage 2".

[18] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".

[19] 3GPP TS 36.133: "Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management".

[20] ES 203 228 V1.0.0: "Environmental Engineering (EE); Assessment of mobile network energy efficiency".

[21] ES 203 228 V1.0.0: "Environmental Engineering (EE); Assessment of mobile network energy efficiency".

[22] 3GPP TS 32.130: "Network sharing; Concepts and requirements".

[23] ETSI ES 202 336-12 V1.1.1: "Environmental Engineering (EE); Monitoring and control interface for infrastructure equipment (power, cooling and building environment systems used in telecommunication networks); Part 12: ICT equipment power, energy and environmental parameters monitoring information model".

[24] 3GPP TS 36.465: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN) and Wireless LAN (WLAN); Xw interface user plane protocol".

[25] 3GPP TS 36.361: "Evolved Universal Terrestrial Radio Access (E-UTRA); LTE-WLAN Radio Level Integration Using IPsec Tunnel (LWIP) encapsulation; Protocol specification".

3 Measurement family and abbreviations

3.1 Measurement family

The measurement names defined in the present document are all beginning with a prefix containing the measurement family name (e.g. RRC.AttConnEstab.*Cause*). This family name identifies all measurements which relate to a given functionality and it may be used for measurement administration (see TS 32.401 [5]).

The list of families currently used in the present document is as follows:

- DRB (measurements related to Data Radio Bearer).
- RRC (measurements related to Radio Resource Control).
- RRU (measurements related to Radio Resource Utilization).
- ERAB (measurements related to E-RAB).
- HO (measurements related to Handover).
- S1SIG (measurements related to S1 Signalling).
- SRB (measurements related to Signalling Radio Bearer).
- PAG (measurements related to Paging).
- EQPT (measurements related to Equipment).
- UECNTX (measurements related to UE CONTEXT).
- TB (measurements related to Transport Block).
- MR (measurements related to Measurement Report).
- PEE (measurements related to Power, Energy and Environmental (PEE) parameters).

- LWI (measurements related to LTE and WLAN integration, including LWA and LWIP).
- ENDC (measurements related to E-UTRA-NR Dual Connectivity).

3.2 Abbreviations

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

3GPP	3G Partnership Project
BLER	Block Error Rate
CRC	Cyclic Redundancy Check
EPS	Evolved Packet System
EQPT	Equipment
E-UTRAN	Evolved UTRAN
E-RAB	E-UTRAN Radio Access Bearer
HO	Handover
kbit	kilobit (1000 bits)
MCE	Multi-cell/multicast Coordination Entity
MOP	Master Operator
PCell	Primary Cel
PEE	Power, Energy and Environmental l
QoS	Quality of Service
RN	Relay Node
SCell	Secondary Cell
TB	Transport Block
UTRAN	Universal Terrestrial Radio Access Network

NOTE: Below there's a list of abbreviations used within the measurement types for field E of the measurement template (see 3GPP TS 32.404 [6]).