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TECHNICAL SPECIFICATION

**Digital cellular telecommunications system (Phase 2+);
Universal Mobile Telecommunications System (UMTS);
LTE;
Telecommunication management;
Performance Management (PM);
Performance measurements for Evolved Packet Core (EPC)
and non-3GPP access interworking system
(3GPP TS 28.402 version 13.0.0 Release 13)**

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Contents

Foreword

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

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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.

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	Telecommunication management; Performance Management (PM); Performance measurements Evolved Universal Terrestrial Radio Access Network (E-UTRAN)
32.426	Telecommunication management; Performance Management (PM); Performance measurements Evolved Packet Core (EPC) network
32.452	Performance Management (PM); Performance measurements Home Node B Subsystem (HNS)
32.453	Performance Management (PM); Performance measurements Home enhanced Node B Subsystem (HeNS)
28.402	**Performance Management (PM); Performance measurements for Evolved Packet Core (EPC) and non-3GPP access Interworking System**

The present document is part of a set of specifications, which describe the requirements and information model necessary for the standardized Operation, Administration and Maintenance (OA&M) of the Evolved Packet Core (EPC) and non-3GPP access Interworking System (TS 23.402 [4]).

During the lifetime of EPC and non-3GPP access network interworking, its logical and physical configuration undergo changes of varying degrees and frequencies in order to optimize the utilization of the network resources. These changes are executed through network configuration management activities and/or network engineering, see TS 32.600 [1].

Many of the activities involved in the daily operation and future network planning of interworking 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.

Annex B of TS 32.404 [2] 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 [2] 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 EPC and non-3GPP access network interworking.

TS 32.401 [3] describes Performance Management concepts and requirements.

The present document is valid for all measurement types provided by an implementation of EPC and non-3GPP access Interworking System. Only measurement types that are specific to EPC and non-3GPP access interworking are defined within the present documents. Vendor specific measurement types used in EPC and non-3GPP access Interworking System 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) are 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 ePDG);

- Header 2: Measurement function (e.g. Tunnel establishment);

- 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, 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 TS 32.600: "Telecommunication management; Configuration Management (CM); Concept and high-level requirements".

[2]   3GPP TS 32.404: "Performance Management (PM); Performance measurements - Definitions and template".

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

[4]   3GPP TS 23.402: "Architecture enhancements for non-3GPP accesses".

[5]   3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [5] 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 [5].

The measurement names defined in the present document are all beginning with a prefix containing the measurement family name. This family name identifies all measurements which relate to a given functionality and it may be used for measurement administration (see TS 32.401 [3]).

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

- SUB (measurements related to Subscriber Management)

- TUN (measurements related to Tunnel Establishment Management)

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [5] 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 [5].

AAA   Access, Authentication and Authorisation
ePDG   Evolved Packet Data Gateway

4   Measurements related to ePDG

4.1   Tunnel establishment measurements

The measurements types defined in subclause 4.1 are subject to the "2 out of 3 approach".

4.1.1   Attempted tunnel establishment

   a) This measurement provides the number of attempted tunnel establishment

   b) CC

   c) Receipt of tunnel establishment request message from UE to ePDG

   d) A single integer value

   e) TUN.TunEst Att

   f) EPDGFunction

   g) Valid for packet switched traffic.

   h) EPS

4.1.2   Successful tunnel establishment

   a) This measurement provides the number of successful tunnel establishment

   b) CC.

   c) Transmission of tunnel establishment response message from ePDG to UE

   d) A single integer value.

   e) TUN.TunEstSucc

   f) EPDGFunction

   g) Valid for packet switched traffic.

   h) EPS

4.1.3   Failed tunnel establishment

   a) This measurement provides the number of failed tunnel establishment

   b) CC

   c) Transmission of tunnel establishment reject message from ePDG to UE

   d) A single integer value.

   e) TUN.TunEstFail

   f) EPDGFunction

   g) Valid for packet switched traffic.

   h) EPS

5 Measurements related to 3GPP AAA Server

5.1 Attached subscribers measurement

5.1.1 Mean number of attached subscribers

a) This measurement provides the mean number of attached state subscribers

b) SI

c) This measurement is obtained by sampling at a pre-defined interval the number of attached subscribers in AAA server and then taking the arithmetic mean

d) A single integer value

e) SUB.AttachedSubNbrMean

f) 3GPPAAAServerFunction, 3GPPAAAProxyFunction

g) Valid for packet switching

h) Combined

5.1.2 Maximum number of attached subscribers

a) This measurement provides the maximum number of attached state subscribers

b) SI

c) This measurement is obtained by sampling at a pre-defined interval the number of attached subscribers in AAA server and then taking the maximum

d) A single integer value

e) SUB.AttachedSubNbrMax

f) 3GPPAAAServerFunction, 3GPPAAAProxyFunction

g) Valid for packet switching

h) Combined

Annex A (informative):
Use cases for performance measurements definition

This annex provides the use cases for the EPC and non-3GPP access Interworking System performance measurements defined in clause 4 and clause 5.

A.1 Use case for tunnel establishment measurements

It needs to setup secure tunnels between non-3GPP UE and remote tunnel endpoint once UE attaches to interworking system. The tunnel resides between the non-3GPP UE and ePDG. In order to guarantee the user experiences, the tunnel should be established before the data is transmitted. During the period of tunnel establishment, ePDG may reject the tunnel establishment due to QoS profile request or policy enforcement in AAA servers. Those rejections would impact subsequent traffic transmission and user experiences.

It is desirable for operators to get the indications before massive rejection happened.

A.2 Use case for attached subscribers measurement

Non-3GPP UE attach status indicates whether the non-3GPP UE is now being served by the EPC.

The non-3GPP UE attach status is maintained by the 3GPP AAA Server. In the attached state, the UE can initiate packets and receive services via EPC and non-3GPP access network interworking. Operators need to have the knowledge of the number of attached subscribers in AAA server or AAA proxy server to evaluate the capacity status of servers.

Annex B (informative):
Change history

					Change history		
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
2013-04					Initial version for TS skeleton	0.0.0	0.0.1
2013-05					Update the draft with the comments at the meeting and email approval	0.0.1	0.1.0
2013-06					Add performance measurement to TUN	0.1.0	0.2.0
2014-09					Move the applicable counters from 28.401. Corrections of the scope	0.2.0	0.3.0
2014-09					Editorial corrections	0.3.0	0.3.1
2014-09	SP-65	SP-140547			Presented for information and approval	0.3.1	1.0.0
					Upgrade to Rel-12 version	1.0.0	12.0.0
2016-01	SP-70				Upgrade to Rel-13 (MCC)	12.0.0	13.0.0

History

Document history		
V13.0.0	January 2016	Publication