3GPP TS 32.411 V11.0.0 (2012-09)

Technical Specification

**3rd Generation Partnership Project;
Technical Specification Group Services and System Aspects;
Telecommunication management;
Performance Management (PM)
Integration Reference Point (IRP):
Requirements
(Release 11)**

Keywords

UMTS, management, performance

3GPP

Postal address

3GPP support office address

650 Route des Lucioles - Sophia Antipolis
Valbonne - FRANCE
Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Internet

http://www.3gpp.org

Contents

Foreword

This Technical Specification (TS) 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.

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:

32.411: **"Performance Management (PM) Integration Reference Point (IRP): Requirements"**

32.412: "Performance Management (PM) Integration Reference Point (IRP): Information Service (IS)"

32.416: "Performance Management (PM) Integration Reference Point (IRP); Solution Set (SS) definitions"

The present document is part of a TS-family which describes the requirements and information model necessary for the Telecommunication Management (TM) of 3G systems. The TM principles and TM architecture are specified in 3GPP TS 32.101 [2] and 3GPP TS 32.102 [3].

A 3G system is composed of a multitude of Network Elements (NE) of various types and, typically, different vendors, which inter-operate in a co-ordinated manner in order to satisfy the network users' communication requirements.

Any evaluation of PLMN-system behaviour will require performance data collected and recorded by its NEs according to a schedule established by the EM.

This aspect of the management environment is termed Performance Management (PM). The purpose of any PM activity is to collect performance related data, which can be used to locate potential problems in the network.

1 Scope

The present document specifies the overall requirements for the Performance Management Integration Reference Point (PMIRP) as it applies to the Network Elements (NE), Element Manager (EM) and Network Manager (NM).

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 32.6xy: "Telecommunication management; Configuration Management (CM)".

[2]   3GPP TS 32.101: "Telecommunication management; Principles and high level requirements".

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

[4]   3GPP TS 32.401: "Telecommunication management; Performance Management (PM); Concept and requirements".

[5]   3GPP TS 32.111-2 to -5: "Telecommunication management; Fault Management; Parts 2-5: Alarm Integration Reference Point (IRP)".

[6]   3GPP TS 32.30x: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP)".

[7]   3GPP TS 32.341: "Telecommunication management; File Transfer (FT) Integration Reference Point (IRP): Requirements".

[8]   3GPP TS 32.412: "Telecommunication management; Performance Management (PM) Integration Reference Point (IRP): Information Service (IS)".

[9]   ITU-T Recommendation Q.822: "Stage 1, Stage 2 and Stage 3 Description for the Q3 Interface – Performance Management (04/94)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

alarm notification: notification used to inform the recipient about the occurrence of an alarm

event: generic term for any type of occurrence within a network entity
A notification or event report may be used to inform one or more OS(s) about the occurrence of the event

granularity period: the time between the initiation of two successive gatherings of measurement data

measurement job: task for collecting performance measurements

measurement schedule: specifies the time frames during which the measurement job will be active. The measurement schedule contains one or several recording intervals

recording interval: the time period during which the measurement data is collected within the NE. The length of a recording interval will be a multiple of the granularity period

3.2 Abbreviations

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

CM	Configuration Management
EM	Element Manager
FT	File Transfer
FTIRP	File Transfer Integration Reference Point
FTP	File Transfer Protocol
IRP	Integration Reference Point
IS	Information Service
Itf-N	management Interface between the Network and the Network Manager
NE	Network Element
NM	Network Manager
NRM	Network Resource Model
OS	Operations System
PM	Performance Management
PMIRP	Performance Management Integration Reference Point

4 PM concept and requirements

Refer to 3GPP TS 32.401 [4].

5 Detailed requirements

5.1 Overall PM concept of Itf-N

An operations system on the network management layer (i.e. the NM) provides performance management services and functions required by the 3G operator on top of the element management layer.

The N interface (Itf-N) may connect the Network Management system either to Element Managers (EMs) or directly to the Network Elements (NEs). This is done by means of Integration Reference Points (IRPs). In the following, the term "subordinate entities" defines either EMs or NEs, which are in charge of supporting the N interface.

This clause describes the properties of an interface enabling a NM to supervise a 3G-telecommunication network including - if necessary - the managing EMs. To provide to the NM the Performance Management capability for the network implies that the NM and the subordinate entities have to agree on the following:

- The identification of the performance measurements for each relevant network resource class, or for instances of a network resource class.

- The identification of the network resource instances whose performance measurements are required by NM.

- The identification of the performance measurement attributes that can serve as a threshold and the identification of the corresponding threshold value(s).

- The identification of the files containing collected performance measurements for retrieval by NM.

- Notification of available files containing collected performance measurements for retrieval by NM.

- The network configuration (due to the fact that measurement results, performance alarms and related state change information are always originated by network resources, see the Configuration Management (CM) NRM IRPs in 3GPP TS 32.6xy [1]). This is, however, not part of the PM functionality.

5.2 Management of network performance measurements

The IRPManager shall be able to request the IRPAgent to:

- Collect specific performance measurements on specific network resources. The network resources, whose performance measurements are to be managed or collected, must have been modelled by the 3GPP Network Resource IRP or vendor-specific extended NRM and must be visible via the Bulk or Basic CM IRP.

- Collect the performance measurements in a file. The data format of this file shall be specified in the 3GPP defined set of PM Specifications.

- Emit notification announcing the availability of such file(s).

- Create measurement jobs.

- Suspend, Resume, and Stop running measurement jobs.

- Define measurement job schedule, including the definition of the recording interval(s), job start time and job stop time.

- Stop scheduled measurement jobs.

- Report status of the running and scheduled measurement jobs (as response to corresponding queries from the IRPManager).

It is noted that the IRPAgent can only derive or determine the value of a performance measurement at the end of a granularity period (status inspection and discrete event registration). The IRPAgent may also have to reset the value of a performance measurement at the beginning of a granularity period. The above IRPAgent behaviours are dependent on the nature of the performance measurement types (cumulative counter, status inspection, gauge, and discrete event registration).

5.3 Management of threshold alarms

The IRPManager shall be able to request the IRPAgent to:

- Set threshold values to specific performance measurements of specific network resources.

- Emit an alarm notification (including clearing) when:
  - (a) the threshold value(s) have been crossed and not just reached, in a similar fashion as that defined in ITU-T Recommendation Q.822 [9]
  or
  - (b) the threshold value(s) have been reached.

  It is the IRPAgent's choice to support (a) or (b) (but not both). The support is on an IRPAgent system wide basis and is not on a per threshold basis. The IRPAgent's behaviour regarding which approach (i.e., (a) or (b) above) to use, shall be the same for emitting alarms and for clearing alarms.

5.4 Management of measurement events

The IRPManager shall be able to:

- Subscribe to notifications that carry threshold alarms and information on the availability of performance measurement data files.

5.5 Management of measurement files

The IRPManager shall be able to:

- Manage the transfer of data files containing performance measurement data.

- Request a list of available files, including the specification of filter.

For information:

- The requirements for measurement file management may be satisfied by a separate File Transfer IRP.

6 Overview of IRPs related to PM

The N interface is built up by a number of IRPs. The basic structure of the IRPs is defined in 3GPP TS 32.101 [2] and 3GPP TS 32.102 [3].

For the purpose of PM the following IRPs are needed:

- Performance Management IRP (PMIRP), i.e. 3GPP TS 32.41x-series.

- Alarm IRP (3GPP TS 32.111-series [5]).

- Notification IRP (3GPP TS 32.30x [6]).

- File Transfer IRP (3GPP TS 32.341 [7]).

For an IRPAgent to be compliant to the PMIRP IS (3GPP TS 32.412 [8]), it shall minimally include the following:

1. The support of all mandatory items defined in the PM IRP IS specification (3GPP TS 32.412 [8] (e.g., mandatory operations defined within a mandatory interface, mandatory notifications defined within a mandatory interface).

2. An FTIRP (3GPP TS 32.341 [7]) that shall have:

    a. An FTP Server capability.

    b. The capability to emit notifyFileReady and notifyFilePreparationError.

    c. A listAvailableFiles operation.

NOTE: Bullet 2 will be replaced with "A compliant FTIRP" if the mandatory operations & notifications in FTIRP IS are finalised and identical to that defined above.

3. A compliant NotificationIRP (3GPP TS 32.30x [6]).

4. A compliant AlarmIRP [5] if the PM IRPAgent PMIRP supports the threshold monitoring capabilities.

It is noted that the NotificationIRP (3GPP TS 32.30x [6]) may not be exclusively used by the PMIRP. It may be shared by other xxxIRP(s) such as BasicCMIRP in the sense that in a single subscribe operation, the IRPManager can subscribe for both PM and CM related notifications. Whether the NotificationIRP (3GPP TS 32.30x [6]) is shared or not is a vendor-specific design choice.

It is noted that the AlarmIRP [5] may not be exclusively used by the PMIRP. Its AlarmList may contain non-PM related alarms, for example. Such usage of AlarmIRP [5] is a vendor-specific design choice.

It is also noted that the FTIRP (3GPP TS 32.341 [7]) may or may not be exclusively used by the PMIRP.

Annex A (informative):
Change history

					Change history		
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
Sep 2002	S_17	SP-020500	--	--	Submitted to TSG SA#17 for Information	1.0.0	
Jun 2003	S_20	SP-030294	--	--	Submitted to TSG SA#20 for Approval	2.0.0	6.0.0
Sep 2003	S_21	SP-030432	001	--	Expansion of the requirements for threshold alarms on bounded variables	6.0.0	6.1.0
Dec 2003	S_22	SP-030649	002	--	Add PM IRP compliance clause	6.1.0	6.2.0
Jun 2004	S_24	SP-040271	003		Clarify threshold alarm trigger condition – Align with 32.401 and ITU-T Q.822	6.2.0	6.3.0
Jun 2007	SA_36	--	--	--	Automatic upgrade to Rel-7 (no CR) at freeze of Rel-7. Deleted reference to CMIP SS, discontinued from R7 onwards.	6.3.0	7.0.0
Mar 2009	SA_43	SP-090207	004	--	Include reference to SOAP Solution Set specification	7.0.0	8.0.0
Dec 2009	-	-	-	-	Update to Rel-9 version (MCC)	8.0.0	9.0.0
2011-03	-	-	-	-	Update to Rel-10 version (MCC)	9.0.0	10.0.0
2012-09	-	-	-	-	Update to Rel-11 version (MCC)	10.0.0	**11.0.0**