Key Performance Indicator for OMA Enablers Requirements

Candidate Version 1.0 – 13 Apr 2010

Open Mobile Alliance

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1. Scope (Informative)

The scope of this specification is to identify the requirements (and a few informative use cases where appropriate) for the Key Performance Indicators in OMA (KPIinOMA). The objective is to determine the requirements to request and report key performance Measurement from OMA service enablers to operational environments, and the definition of the Key Performance Indicators for the OMA service enablers.

2. References

2.1 Normative References

[RFC2119]   "Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997,
                                  URL:http://www.ietf.org/rfc/rfc2119.txt

2.2 Informative References

[OMADICT]   "Dictionary for OMA Specifications", Version 2.7, Open Mobile Alliance™,
                                  OMA-ORG-Dictionary-V2_7, URL:http://www.openmobilealliance.org/

3GPP TS 32.450 V9.0.0   "3rd Generation Partnership Project;Technical Specification Group Services and System
                                  Aspects;Telecommunication management;Key Performance Indicators (KPI) for E-UTRAN:Definitions
                                  (Release 9)"

3GPP TS 32.404 V9.0.0   3rd Generation Partnership Project;Technical Specification Group Services and System
                                  Aspects;Telecommunication management;Performance Management (PM);Performance Measurements-
                                  Definitions and template(Release 9)

3. Terminology and Conventions

3.1 Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

All sections and appendixes, except "Scope" and "Introduction", are normative, unless they are explicitly indicated to be informative.

3.2 Definitions

Key Performance Indicator	Essential information for evaluating behaviour or quality of delivered services
KPIinOMA-enabled Instance	An OMA enabler implementation, which can work under the KPIinOMA framework and report Performance Measurement to Operational Environments
Operational Environment	An environment under the KPIinOMA framework, in which the hosted entities have the capability to execute operations related to KPIs.
Performance Measurement	The measurement data collected from the OMA service enablers (e.g. counters), which are then used to derive the Key Performance Indicators

3.3 Abbreviations

KPI	Key Performance Indicator
KPIinOMA	Key Performance Indicators in OMA
OE	Operational Environment
OMA	Open Mobile Alliance

4. Introduction   (Informative)

Key Performance Indicators in OMA (KPIinOMA) aims to create standard KPI framework and KPI definition for individual OMA Enablers.

Currently, there is no OMA enabler defines the Performance Measurement which can be used to derive the KPIs by Operational Environment. There is no common understanding on the enabler service performance. So it is hard to evaluate the performance and service quality of individual enabler and related equipments. Each operator has to define their own KPIs for enablers and require vendors to do customized implementations, which is a large increment of cost for the whole industry.

Using the new defined KPI framework and enabler KPIs, The service performance and quality of OMA enablers implemented by different vendors can be evaluated in a common understanding. And operators' network management/performance management system can obtain the performance or quality measurement data from the enabler when using OMA standard implementation.

4.1   Version 1.0

The KPIinOMA enabler V1.0 aims to define the following aspects:

- • Key Performance Indicator framework: mechanism to request and report Performance Measurement from OMA service enablers to Operational Environment.

- • Key Performance Indicator definition: include Performance Measurement that enablers should report, the formular to derive the Key Performance Indicators and other necessary information.

5. Key Performance Indicator for OMA enablers release description   (Informative)

The main objective of the Key Performance Indicators in OMA (KPIinOMA) is to define the framework of OMA enabler KPIs and guide OMA enablers to define their own service related KPIs, focusing on following activities:

-       Defining the framework and mechanism of Enabler Performance Measurement reporting

    •   Architecture for the OMA enabler KPI reporting

    •   General enabler Performance Measurement reporting mechanism: how the Operational Environment gather necessary data from service enabler/components

    •   Common interfaces requirements for requests and reports, data transfer mechanisms, etc.

-       Specifying Enabler KPI for individual enablers

    •   Enabler KPI template: includes all information that describes a specific enabler KPI based on the template

    •   Defining Enabler KPIs for individual enablers

Figure 1 gives a graphical representation of the KPIinOMA scope with the roles/actors (e.g. Operational Environment, OMA Enablers).
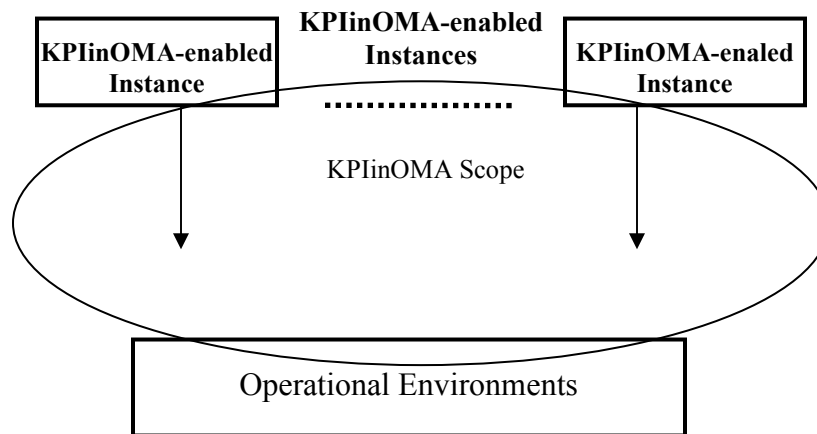
Figure 1: High level diagram of KPIinOMA scope

OMA Enablers in the upper part of the figure are the data sources of Key Performance Indicator. According to the KPIinOMA framework, the Operational Environment can obtain standard KPI from individual OMA Enablers.

5.1 End-to-end Service Description

The KPIinOMA framework can be used by the Operational Environments to derive the Key Performance Indicators based on the Performance Measurement reported by OMA service enablers.

The KPIinOMA also describes the Performance Measurement collected from the OMA service enablers, which are then used to derive the Key Performance Indicators.

The KPI framework provides the following market benefits:

- For the vendors, the service performance and quality of OMA enablers implemented by different vendors can be evaluated in a common understanding. And the vendors can improve their products by the collected Performance Measurement from different service enablers.

- For the Operator, the Operator's network management/performance management system can obtain the performance or quality measurement data from the enabler when using OMA standard implementation. Operator can improve the services through the analysis of the collected Performance Measurement and attract the user to use the services.

6. Requirements   (Normative)

6.1   High-Level Functional Requirements

6.1.1   KPI Template Requirements

Label	Description	Release
	KPI template SHALL include the following fields:	
KPIinOMA-TEM-001	- the name of the KPI.	KPIinOMA V1.0
KPIinOMA-TEM -002	- the description of the KPI.	KPIinOMA V1.0
KPIinOMA-TEM -003	- the purpose of the KPI.	KPIinOMA V1.0
KPIinOMA-TEM -004	- the formula of the KPI.	KPIinOMA V1.0
KPIinOMA-TEM -005	- the KPI reporting time interval.	KPIinOMA V1.0
KPIinOMA-TEM -006	- the KPIinOMA-enabled Instance information, such as CPM, CAB and etc.	KPIinOMA V1.0
KPIinOMA-TEM -007	- the KPI type information, such as mean, ratio and cumulative.	KPIinOMA V1.0
KPIinOMA-TEM -008	- the KPI unit information, such as percentage, time interval and bit/s.	KPIinOMA V1.0
KPIinOMA-TEM-009	- the KPI data type and its accuracy information, such as real, integer and etc.	KPIinOMA V1.0
	KPI template SHOULD include the following fields:	
KPIinOMA-TEM -0010	- the KPI category information, which used by OE to categorize different KPIs.	KPIinOMA V1.0

Table 1: High-Level Functional Requirements on KPI Template

6.1.2   KPI Definition Requirements

Label	Description	Release
KPIinOMA-DEF-001	The KPIs SHOULD be the measurement on number of service subscribers, which may cover total, increment, unsubscribe, online subscribe, and etc, if such information is available.	KPIinOMA v1.0
KPIinOMA-DEF-002	The KPIs SHOULD be the measurement on sessions (e.g. parallel working session) of a service, if the service supports sessions.	KPIinOMA v1.0
KPIinOMA-DEF-003	The KPIs SHOULD be the respond delay for a service, if such information is available.	KPIinOMA v1.0
KPIinOMA-DEF-004	The KPIs SHOULD be the traffic load for a service, if such information is available.	KPIinOMA v1.0

Table 2: High-Level Functional Requirements on KPI Definition

6.1.3   Security

Label	Description	Release
KPIinOMA SEC-001	KPIinOMA-enabled instance SHALL report the Performance Measurement to OE in a secure environment. Informational Note: security mechanisms of the underlying operator's network can be re-used.	KPIinOMA v1.0

Table 3: High-Level Functional Requirements – Security Items

6.1.3.1   Authentication

Label	Description	Release
KPIinOMA-AUTH-001	KPIinOMA-enabled instance SHALL support mutual authentication in the OE	KPIinOMA v1.0

Table 4: High-Level Functional Requirements – Authentication Items

6.1.3.2   Data Integrity

Label	Description	Release
KPIinOMA-INT-001	The integrity of the Performance Measurement SHALL be maintained.	KPIinOMA v1.0

Table 5: High-Level Functional Requirements – Data Integrity Items

6.1.4   Interoperability

Label	Description	Release
KPIinOMA-IOT-001	The KPIinOMA-enabled instances SHALL support the interoperation with OE (e.g. when existing multiple entities in the OE receiving Performance Measurement).	KPIinOMA V1.0

Table 6: High-Level Functional Requirements – Interoperability Items

6.2   Overall System Requirements

6.2.1   KPIinOMA Framework

Label	Description	Release
KPIinOMA-FRM-001	Under the KPIinOMA framework, OE SHALL be able to receive the Performance Measurement reported by individual KPIinOMA-enabled instances.	KPIinOMA V1.0
KPIinOMA-FRM-002	KPIinOMA-enabled instance SHALL be able to report Performance Measuerement to OE.	KPIinOMA V1.0
KPIinOMA-FRM-003	Under the KPIinOMA framework, OE SHALL be able to query Performance Measuerement from KPIinOMA-enabled instance.	KPIinOMA V1.0
KPIinOMA-FRM-004	KPIinOMA-enabled instance SHALL support the query of Performance Measuerement from OE.	KPIinOMA V1.0
KPIinOMA-FRM-005	KPIinOMA-enabled Instance SHALL be able to be configured by the Operational Environment, for example, reporting time intervals, reporting time.	KPIinOMA V1.0
KPIinOMA-FRM-006	KPIinOMA-enabled Instance SHALL support to report Performance Measurement based on pre-defined time intervals.	KPIinOMA V1.0
KPIinOMA-FRM-007	The pre-configuration of KPIinOMA-enabled instances SHOULD allow for automatically reporting of Performance Measurement.	KPIinOMA V1.0

KPIinOMA-FRM-008	The Performance Measurement MAY be reported and queried with KPI-related metadata information (e.g. information type, start date, start time, end date, end time).	KPIinOMA V1.0

Table 7: High-Level System Requirements on KPIinOMA Framework

6.2.2 Format of Performance Measurement

Label	Description	Release
KPIinOMA-FMT-001	The Performance Measurement MAY be stored in a file format.	KPIinOMA V1.0
KPIinOMA-FMT-002	The Performance Measurement MAY be stored in databases.	KPIinOMA V1.0

Table 8: High-Level System Requirements on Format of Performance Measurement

Appendix A.   Change History   (Informative)

A.1   Approved Version History

Reference	Date	Description
n/a	n/a	No prior version –or- No previous version within OMA

A.2   Draft/Candidate Version 1.0 History

Document Identifier	Date	Sections	Description
Draft Versions OMA-RD-KPIinOMA-V1_0	11 Nov 2009	Initial baseline	As agreed during REQ CC on Nov 19, see OMA-REQ-2009-0224-MINUTES_19Nov2009_CC
	3 Dec 2009	1, 3.3, 4, 5	Incorporate with OMA-REQ-KPIinOMA-2009-0002-CR_Introduction_and_Scope OMA-REQ-KPIinOMA-2009-0003-CR_Release_Description
	08 Jan 2010	6.1.A, 6.1.B, 6.1.C, 6.1.D, 6.2.1, B.1 Editorial on 6.1.2	Incorporate with OMA-REQ-KPIinOMA-2009-0005R01-CR_Framework_Requirements OMA-REQ-KPIinOMA-2009-0008-CR_KPI_expression OMA-REQ-KPIinOMA-2009-0009R01-CR_KPI_characters OMA-REQ-KPIinOMA-2009-0010R01-CR_KPI_categorise OMA-REQ-KPIinOMA-2009-0012R01-CR_KPI_on_session_status
	21 Jan 2010	3.2, 3.3, 8	Incorporate with OMA-REQ-KPIinOMA-2010-0001R01-CR_OE_Definition OMA-REQ-KPIinOMA-2010-0002R02-CR_KPIinOMA_Instance_Defintion
	28 Jan 2010	3.2	Incorporate with OMA-REQ-KPIinOMA-2010-0003R01-CR_KPI_Definition
	02 Feb 2010	2.1 3.2 4.1 5.1, 6.1.1 6.1.6, 6.1.6.1, 6.1.6.2 6.1.10 6.2.1 6.2.2 6.2.3 Appendix B.2	Incorporate with: OMA-REQ-KPIinOMA-2010-0004R02-CR_Security_Requirements OMA-REQ-KPIinOMA-2010-0008-CR_Version_Description OMA-REQ-KPIinOMA-2010-0009R01-CR_End_to_End_Service_Description OMA-REQ-KPIinOMA-2010-0010R02-CR_Administration_Usability_and_interoperability OMA-REQ-KPIinOMA-2010-0011R01-CR_reporting_mechanism_requirement_for_KPIinOMA OMA-REQ-KPIinOMA-2010-0012R01-CR_KPI_Definition_Requirement OMA-REQ-KPIinOMA-2010-0014R01-CR_UC_for_collecting_specified_KPI_information OMA-REQ-KPIinOMA-2010-0018R01-CR_Requirement_for_KPI_collection OMA-REQ-KPIinOMA-2010-0019R01-CR_KPI_format_requirement
	22 Mar 2010	n/a	OMA-REQ-KPIinOMA-2010-0035-CR_RDRR_Comments_Resolution Editorial Cleaning up
Candidate Version OMA-RD-KPIinOMA-V1_0	13 Apr 2010	n/a	Status changed to Candidate by TP TP ref# OMA-TP-2010-0169-INP_KPIinOMA_V1_0_RD_for_Candidate_Approval

Appendix B.   Use Cases   (Informative)

B.1   Performance Measurement Report

This use case demonstrates the abilities that OE receives the performance measurement reported by the KPIinOMA-enablerd CPM service.

B.1.1   Short Description

To evaluate conversation reliability and stability provided by CPM service, a KPI is defined and named as "conversation failure ratio". The KPIinOMA-enabled instance of CPM Server collects the numbers of failure conversation and total requested conversation, which is the Performance Measurement of the defined KPI. When the pre-defined time interval is reached, CPM Server reports the Performance Measurement to the OE. After receiving the Performance Measurement, OE calculates the KPI using the pre-defined formular, performs necessary analysis, and shows the final statistic information to operation administrator.

B.1.2   Market benefits

Operators' network management/performance management system can obtain the performance or quality measurement data from the enabler when using OMA standard implementation. By this, operator can improve the service and improve the user experience to use the service.

B.2   Performance Measurement Query

This use case shows that OE can query the Performance Measurement from KPIinOMA-enabled instance of CAB enabler based on OE's administration policy.

B.2.1   Short Description

The KPIinOMA-enabled CAB implementation collects and records Performance Measurement, such as, number of CAB subscribers, number of contact entries exchanged with social network, and etc.

In order to derive the KPI, the OE can query the CAB Server for specific items of Performance Measurement.

Based on obtained information, OE can evaluate the CAB service and identify whether the CAB service needs optimising.

B.2.2   Market benefits

Based on the obtained KPI, the operator can evaluate the CAB service status, and optimize the CAB service for the end users.