



# Enabler Release of DiagMon Management Object

## Candidate Version 1.2 – 09 Oct 2012

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**Open Mobile Alliance**  
OMA-ER-DiagMon-V1\_2-20121009-C

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# 1. Scope

The DiagMon v12 Enabler updates Diagnostic and Monitoring v1.1 functions [DiagMon1\_1] and adds new Diagnostics and Monitoring Functions. It enables the framework as defined in [DiagMon1\_0] and defines new Traps.

This specification defines the requirements and architecture of the DiagMon v1.2 Enabler.

## 2. References

### 2.1 Normative References

- [DM1\_3] “OMA Device Management Enabler Release Definition”, Version 1.3, Open Mobile Alliance, OMA-ERELED-DM\_V1\_3,  
[URL:http://www.openmobilealliance.org/](http://www.openmobilealliance.org/)
- [DMTND] “OMA Device Management Tree and Description, Version 1.3”. Open Mobile Alliance™, OMA-TS-DM\_TND-V1\_3.  
[URL:http://www.openmobilealliance.org/](http://www.openmobilealliance.org/)
- [OSE] “OMA Service Environment”, Open Mobile Alliance™,  
[URL:http://www.openmobilealliance.org/](http://www.openmobilealliance.org/)
- [RFC2119] “Key words for use in RFCs to Indicate Requirement Levels”, S. Bradner, March 1997,  
[URL:http://www.ietf.org/rfc/rfc2119.txt](http://www.ietf.org/rfc/rfc2119.txt)
- [RFC4234] “Augmented BNF for Syntax Specifications: ABNF”. D. Crocker, Ed., P. Overell. October 2005,  
[URL:http://www.ietf.org/rfc/rfc4234.txt](http://www.ietf.org/rfc/rfc4234.txt)
- [SCRRULES] “SCR Rules and Procedures”, Open Mobile Alliance™, OMA-ORG-SCR\_Rules\_and\_Procedures,  
[URL:http://www.openmobilealliance.org/](http://www.openmobilealliance.org/)

### 2.2 Informative References

- [DiagMon1\_0] “OMA DiagMon Management Object Enabler Release Definition”, Version 1.0, Open Mobile Alliance, OMA-ERELED-DiagMon\_V1\_0,  
[URL:http://www.openmobilealliance.org/](http://www.openmobilealliance.org/)
- [DiagMon1\_1] “OMA DiagMon Management Object Enabler Release Definition”, Version 1.1, Open Mobile Alliance, OMA-ERELED-DiagMon\_V1\_1,  
[URL:http://www.openmobilealliance.org/](http://www.openmobilealliance.org/)
- [DM1\_2] “OMA Device Management Enabler Release Definition”, Version 1.2, Open Mobile Alliance, OMA-ERELED-DM\_V1\_2,  
[URL:http://www.openmobilealliance.org/](http://www.openmobilealliance.org/)
- [OMADICT] “Dictionary for OMA Specifications”, Version 2.9, Open Mobile Alliance™, OMA-ORG-Dictionary-V2\_9,  
[URL:http://www.openmobilealliance.org/](http://www.openmobilealliance.org/)

## 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

Kindly consult [OMADICT] for all definitions used in this document.

### 3.3 Abbreviations

Kindly consult [OMADICT] for all abbreviations used in this document.

## 4. Introduction

This section is mostly informative apart for section 4.1.

In order to provide advanced customer care services, the DiagMon v1.2 enabler provides an interface between the Management Authority and Devices – based on OMA DM.

### 4.1 MOID Registration (Normative)

Open Mobile Naming Authority (OMNA) maintains a registry of Management Object Identifiers (MOIDs) for standardized DiagMon functions and Traps. This registry can be found at the following URL:

<http://www.openmobilealliance.org/tech/omna>

MOIDs following this specification SHALL be in a form of “urn:oma:mo:<subsystem>:<function>:<version>”.

MOID for a DiagMon function which is defined by OMA MUST be an URN prefixed with “urn:oma:mo:oma-diag:”.

MOID for a Trap which is defined by OMA MUST be an URN prefixed with “urn:oma:mo:oma-diagmontrap:”.

The OMNA DiagMon Registry is open to OMA Working Groups, external Standards Developing Organizations (SDOs) and vendors. The registration process binds a DiagMon Function or Trap to a globally unique MOID.

### 4.2 Version 1.0

Version 1.0 of the DiagMon enabler provides a basic framework for the purposes of obtaining diagnostics and monitoring information in a predictable and industry-wide manner.

### 4.3 Version 1.1

Version 1.1 of the DiagMon enabler provides a set of functions that provide handset diagnostic information in a predictable and industry-wide manner.

### 4.4 Version 1.2

Version 1.2 of the DiagMon enabler continue the work of DiagMon v1.1 by updating some of the functions, and adding some new functions, define traps and enhancing the framework.

## 5. Requirements

(Normative)

Diagnostics and Monitoring (DiagMon) enabler version 1.2 is a continuation of the work in DiagMon enabler version 1.1 and version 1.0. The requirements in this chapter include requirements from DiagMon version 1.2 and from previous releases.

### 5.1 High-Level Functional Requirements

Label	Description	Enabler Release
DIAG-GEN-1	The DiagMon enabler SHALL support the functions from DiagMon v1.1 as per their stated support requirements.	DiagMon v1.1
DIAG-GEN-2	The DiagMon enabler SHALL support a mechanism to report voice call metrics. (e.g.: Call detail records, dropped call trap/metrics,etc.)	DiagMon v1.2
DIAG-GEN-3	The DiagMon enabler SHALL support a mechanism to report the result of built-in device tests.	DiagMon v1.2
DIAG-GEN-4	The DiagMon enabler SHALL support a mechanism to start and stop built-in device tests.	DiagMon v1.2
DIAG-GEN-5	The DiagMon enabler SHALL support a mechanism to start and stop recording 'trace log', which records trace information with timestamp, such as user interaction, invocation of application, and any other useful information.	DiagMon v1.2
DIAG-GEN-6	The DiagMon enabler SHALL support a mechanism to change the level of detail on logging records.	DiagMon v1.2
DIAG-GEN-7	The DiagMon enabler SHALL support a mechanism to log specific events on the device.	DiagMon v1.2
DIAG-GEN-8	The DiagMon enabler SHALL support a mechanism to report sensor related data.	DiagMon v1.2
DIAG-GEN-9	The DiagMon enabler SHALL support a mechanism to report service related QoS metrics.	DiagMon v1.2
DIAG-GEN-10	The DiagMon enabler SHALL support the mechanism to specify threshold levels for different DiagMon Functions.	DiagMon v1.2
DIAG-GEN-11	The DiagMon enabler SHALL support the ability to issue traps when threshold levels are crossed for different DiagMon Functions.	DiagMon v1.2
DIAG-GEN-12	The DiagMon enabler SHALL support the ability to issue traps when specified conditions are met for different DiagMon Functions.	DiagMon v1.2
DIAG-GEN-13	Diagnostics and Monitoring information SHALL be collected from a device as defined by DM managed objects.	DiagMon v1.0
DIAG-GEN-14	Network monitoring information SHALL be collected from a device as defined by DM managed objects.	DiagMon v1.0
DIAG-GEN-15	The device SHALL provide a means to notify the Diagnostics and Monitoring management authority of faults.	DiagMon v1.0
DIAG-GEN-16	A management authority SHALL have a means to query and set parameters for dynamic attributes of the device, e.g. battery level, available resources, via managed objects.	DiagMon v1.0
DIAG-GEN-17	The DiagMon enabler MAY report Trap events to other DM components, such as DM Scheduling.	DiagMon v1.0
DIAG-GEN-18	The device SHOULD provide a means to notify the Diagnostics and Monitoring management authority of firmware offline update, software offline installation, update and removal.	DiagMon v1.0
DIAG-GEN-19	The DiagMon enabler SHALL support a mechanism that allows the Device to notify the Diagnostics and Monitoring Management Authority that an event has occurred, e.g. notify Diagnostics and Monitoring Management Authority.	DiagMon v1.0



DIAG-GEN-20	The DiagMon enabler SHALL support a mechanism that provides an error-reporting capability.	DiagMon v1.0
DIAG-GEN-21	The DiagMon enabler SHALL support a mechanism to protect diagnostic and monitoring data stored on the device by authenticating and authorising the Management Authority.	DiagMon v1.0
DIAG-GEN-22	The DiagMon enabler SHOULD support a mechanism to report Device User Interface related information.	DiagMon v1.2
DIAG-GEN-23	The DiagMon enabler SHOULD support a mechanism to report data session metrics.	DiagMon v1.2

## 5.2 Reporting Requirements

Label	Description	Enabler Release
DIAG-RPT-1	The DiagMon enabler SHALL be able to limit the reporting of data to specified time periods.	DiagMon v1.2
DIAG-RPT-2	The DiagMon enabler SHALL be able to limit the reporting of data to specified geographic locations.	DiagMon v1.2

## 5.3 Event Trapping Requirements

Label	Description	Enabler Release
DIAG-TRAP-1	The DiagMon enabler SHALL support a mechanism to trap the event of reaching full capacity on the logging data storage, and send alert to all registered recipients of that event.	DiagMon v1.2
DIAG-TRAP-2	The DiagMon enabler SHALL be able to limit the reporting of data to specified geographic locations.	DiagMon v1.2
DIAG-TRAP-3	The DiagMon enabler SHALL support a mechanism to trap the event of reaching a specific threshold of logging data storage, and send alert to all registered recipients of that event.	DiagMon v1.2
DIAG-TRAP-4	The DiagMon enabler SHALL support a mechanism to report the current status and usage of logging data storage.	DiagMon v1.2

## 5.4 Usability

Label	Description	Enabler Release
DIAG-USE-1	The end user MAY initiate a self-care activity for diagnosing a problem for devices enabled with self-care capabilities.	DiagMon v1.0
DIAG-USE-2	The end user MAY be made aware that a diagnostics or monitoring activity is commencing.	DiagMon v1.0
DIAG-USE-3	Network monitoring data logging or reporting MAY be transparent to the end user.	DiagMon v1.0
DIAG-USE-4	The end user MAY be informed that a session with a management authority is taking place prior to or after introducing client configuration changes.	DiagMon v1.0
DIAG-USE-5	If there is an interruption in a diagnostics and monitoring operation, the operation SHALL be resumed at the next practical opportunity.	DiagMon v1.0

DIAG-USE-6	The user SHOULD be asked for confirmation to proceed before diagnostic and monitoring tasks are implemented on the device.	DiagMon v1.0
DIAG-USE-7	The DiagMon enabler SHALL allow Diagnostics and Monitoring operations on the device based on a single user confirmation and/or single Diagnostics and Monitoring Management Authority confirmation.	DiagMon v1.0

## 5.5 Privacy

Label	Description	Enabler Release
DIAG-PRIVACY-1	All data communication between the Device Management Server and a Device, that is personal to the user or confidential to the owner of the information (e.g. some network operator settings) MUST be confidentiality protected.	DiagMon v1.0
DIAG-PRIVACY-2	All Diagnostics data communication between Device Management Servers MUST be confidentiality protected.	DiagMon v1.0
DIAG-PRIVACY-3	The DiagMon enabler SHALL NOT hinder the User's control over collection, use and distribution of their personal information	DiagMon v1.0
DIAG-PRIVACY-4	The DiagMon enabler SHALL support a mechanism to inform the user about implications of installing diagnostic and monitoring MOs on the device.	DiagMon v1.0

## 5.6 Overall System Requirements

Label	Description	Enabler Release
DIAG-SYS-1	The Diagnostics and Monitoring System SHALL rely on features as described in DM v1.2 specifications or higher.	DiagMon v1.2
DIAG-SYS-2	The Device SHALL be able to acknowledge the receipt and installation of DiagMon data downloaded from the Diagnostics and Monitoring System.	DiagMon v1.0
DIAG-SYS-3	The Diagnostics and Monitoring System SHALL be capable of manipulating a Device's Diagnostics and Monitoring Management Object.	DiagMon v1.0
DIAG-SYS-4	The Diagnostics and Monitoring System SHALL be capable of querying Devices for information about Device properties, configuration, and capabilities.	DiagMon v1.0
DIAG-SYS-5	In the event the device is resource constrained, it SHOULD be possible to prioritize events and actions associated with DM Diagnostics and Monitoring.	DiagMon v1.0

## 6. Architectural Model

The architecture of DiagMon 1.2 is unchanged from the architecture of DiagMon 1.1 [DiagMon1\_1].

### 6.1 Dependencies

DiagMon has normative dependency on DM v 1.3 [DM1\_3] but it also works with DM v 1.2 [DM1\_2] implementations and any future releases backward compatible with DM v 1.3 [DM1\_3].

### 6.2 Architectural Diagram

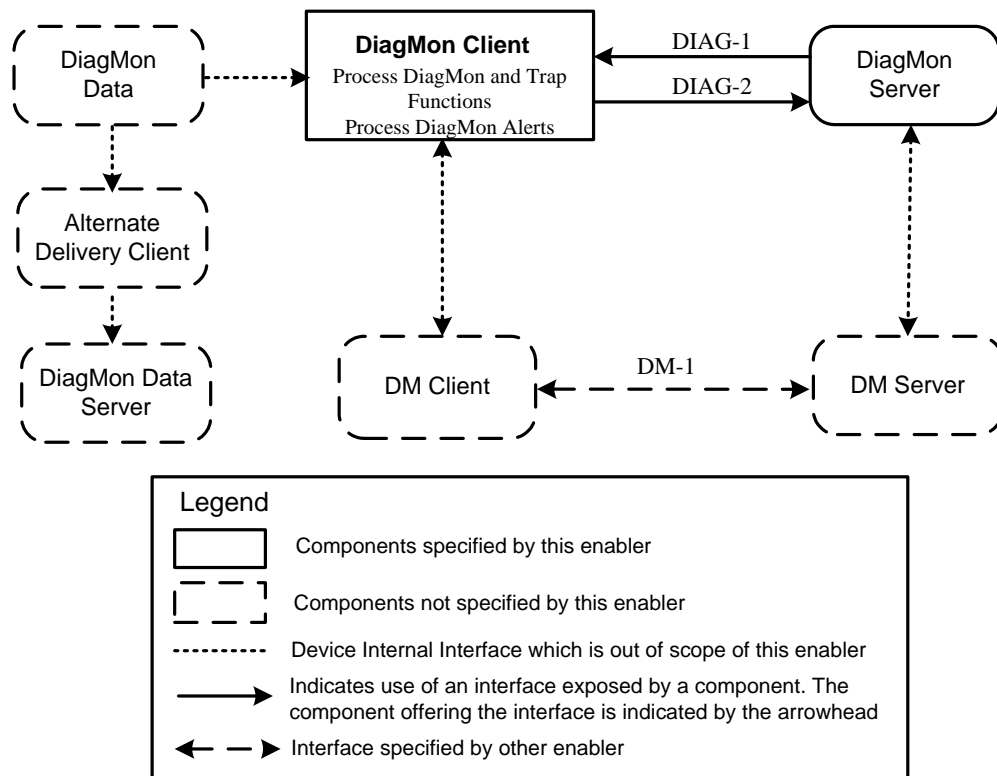


Figure 1: the Architectural Diagram using interfaces

## 6.3 Functional Components and Interfaces/reference points definition

### 6.3.1 Functional Components

#### 6.3.1.1 DiagMon Client

The DiagMon client function is responsible for the Diagnostics and Monitoring activities. The DiagMon client processes and consumes the Diagnostic and Monitoring component (e.g. commands, alerts, packages) delivered to the device by the OMA DM client.

The DiagMon client also communicates a success or failure result to the DM client at the termination of the Diagnostics and Monitoring activity, for communication back to the DM server.

#### 6.3.1.2 DM Client

The DM client makes it possible for the DM Server to manage the device using the DM protocol. For Diagnostics and Monitoring activities, the DM server and the DM client interact over the DIAG-1 interface as well.

#### 6.3.1.3 Device Management System

The Device Management system for Diagnostics and Monitoring is comprised of a Device Management server, DiagMon server and potentially other external management systems. The DM server component supports device discovery, determination of an appropriate Diagnostics and Monitoring component and its delivery to the device over various bearer technologies, represented by the DM-1 interface. It also receives a notification from the DM Client for success or failure of a diagnostics event or diagnostics or monitoring data, invoked over the DIAG-1 interface

#### 6.3.1.4 DiagMon Data

The specific diagnostics and monitoring data and associated components are outside the scope of this enabler. This includes such entities as call and data loggers, and other associated management objects such as Key Performance Indicators or Scheduling. The DiagMon Data may be sent via an alternate delivery protocol to a data server for e.g. processing. However when necessary, the DiagMon alerts are sent over the DIAG-2 interface.

#### 6.3.1.5 Alternate Delivery Client

The alternate delivery client component is an optional feature of the device that makes it possible to update a data server using the alternate delivery protocol. The interaction of the DiagMon agent with the Alternate Delivery Client is out of scope.

### 6.3.2 Interfaces

#### 6.3.2.1 DIAG-1 Interface

The DIAG-1 interface is exposed by the DiagMon Client, which allows other components, such as DiagMon Server, to perform Diagnostics and Monitoring Operations. Through this interface the DiagMon Server can enable and disable diagnostics and/or trap functions on the device. The DiagMon functions will be conveyed by DM messages via the underlying DM-1 interface.

The interface DIAG-1 describes interactions between the Device Management System or server and the device (e.g. DM Client) in setting up the DM sessions, delivering diagnostics and monitoring packages, and communicating results for the DiagMon activities invoked.

### **6.3.2.2 DIAG-2 Interface**

The DIAG-2 interface is exposed by the DiagMon Server, which allows other components, such as DiagMon Client, to send DiagMon Alerts. Through this interface the DiagMon Server can receive results for the DiagMon activities invoked on the device. The DiagMon Alerts will be conveyed by DM messages through underlying DM-1 interface, or an alternate delivery mechanism.

### **6.3.2.3 DM-1 Interface**

This interface describes the client-server protocol and is out of scope for the Diagnostics and Monitoring enabler as it is defined by DM v 1.3 enabler release [DM1\_3]. However, the DM-1 interface is leveraged in Diagnostics and Monitoring activities.

## Appendix A. Change History (Informative)

### A.1 Approved Version History

Reference	Date	Description
n/a	n/a	No prior 1.2 Approved version

### A.2 Draft/Candidate Version 1.2 History

Document Identifier	Date	Sections	Description
Draft Versions OMA-ER-DiagMon-V1_2	27 Jul 2010	All	Baseline as agreed in "OMA-DM-Diag-2010-0100-INP_DiagMon12_Baseline"
	18 Aug 2010	All	Applied OMA-DM-Diag-2010-0101-CR_Empty_Sections OMA-DM-Diag-2010-0102R01-CR_Reporting
	27 Aug 2010	2.1, 3.3, A2	References and abbreviations sorted in alphabetical order Language set to English UK Update of history box
	15 Sep 2010	3.2,4.1,5.1, 5.3,	MOID registration texts in OMA-DM-Diag-2010-0108R2 Add agreed requirements Applied: OMA-DM-Diag-2010-0105R2,OMA-DM-Diag-2010-0106R1 OMA-DM-Diag-2010-0110R1
	19 Oct 2010	5.1	Add agreed requirements applied OMA-DM-Diag-2010-0117R2
	25 Oct 2010	5.1	Applied bugfix CR: OMA-DM-Diag-2010-0122R01
	05 Nov 2010	5.3	Applied bugfix CR OMA-DM-Diag-2010-0113R02.
	24 Nov 2010	5.1, 5.4, 5.5, 5.6	Add agreed requirements applied: OMA-DM-Diag-2010-0130R01-CR_TraceLog OMA-DM-Diag-2010-0131R01-CR_LogLevel OMA-DM-Diag-2010-0132R01-CR_Additional_DiagMon_v1_2_requirements OMA-DM-Diag-2010-0133-CR_Additional_DiagMon_v1_2_requirements OMA-DM-Diag-2010-0134-CR_QoS_Function OMA-DM-Diag-2010-0135R01-CR_Thresholding_etc
	30 Apr 2012	All	Editorial clean-up by DSO, SUP files listing and OMNA considerations parts deleted since they are part of the ERELD
	13 Jun 2012	1, 2, 3, 5, 6	Applied CR: OMA-DM-Diag-2012-0052R02- CR_ER_DM_Version_and_OMA_Dictionary OMA-DM-Diag-2012-0058R01-CR_CONR_ER_cmt_A001
	22 Jun 2012	1, 4, 4.1, 4.4 Appendix B, Appendix C	Applied CR: OMA-DM-Diag-2012-0069R01-CR_ER_cleanup
	Candidate Version OMA-ER-DiagMon-V1_2	09 Oct 2012	n/a