Gateway Management Object Architecture

Approved Version 1.0 – 18 Jun 2013

Open Mobile Alliance

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1. Scope (Informative)

The scope of the Gateway Management Object architecture document is to define the architecture for the DM Gateway Management Object v1.0 enabler. This document fulfills the functional capabilities and information flows needed to support this enabler as described in the Gateway Management Object requirements document [GwMO-RD].

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2. References

2.1 Normative References

[DM-DICT] "Device Management Dictionary", Version 1.0, Open Mobile Alliance™, OMA-SUP-DM-DM_Dictionary-V1_0,
URL:http://www.openmobilealliance.org/

[GwMO-RD] "Gateway Management Object Requirements", Open Mobile Alliance™, OMA-RD-GwMO-V1_0,
URL:http://www.openmobilealliance.org/

[OMA-DM] "OMA Device Management Protocol", Version 1.3, Open Mobile Alliance™,,
URL:http://www.openmobilealliance.org/

[OMA-Push] "OMA Push", Version 2.3, Open Mobile Alliance™,
URL: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

2.2 Informative References

None

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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 [DMDICT] for all definitions used in this document.

3.3 Abbreviations

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

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4. Introduction (Informative)

The Gateway Management Object aims to enable remote operations for the DM Gateway and End Devices behind the DM Gateway. The Gateway Management Object specifications will provide capabilities of processing management actions such as fanout of DM commands from a DM Server to multiple End Devices and aggregation of responses from multiple End Devices.

The objective of this document is to describe the architecture for managing the DM Gateway and End Devices behind the DM Gateway.

4.1 Version 1.0

The GwMO 1.0 enabler release is expected to meet all of the requirements defined in [GwMO-RD].

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5. Architectural Model

5.1 Dependencies

The Gateway Management Object depends on:

- OMA-DM V.1.3 [OMA-DM]
- OMA-Push V.2.3 [OMA-Push].

5.2 Architectural Diagram

5.2.1 Transparent Mode

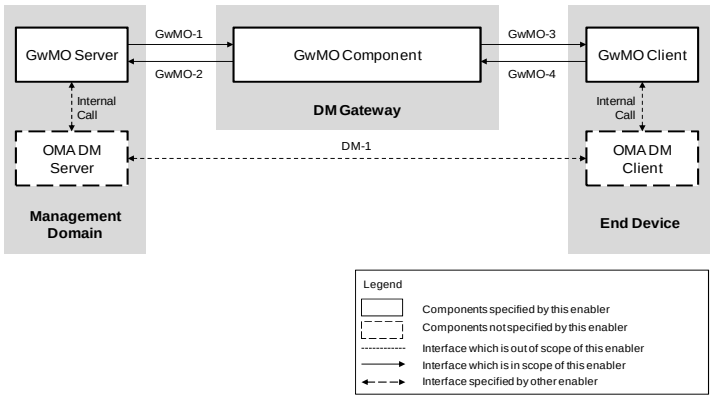

Figure 1: Transparent Mode GwMO Architectural Diagram Using Interfaces

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5.2.2 Proxy Mode

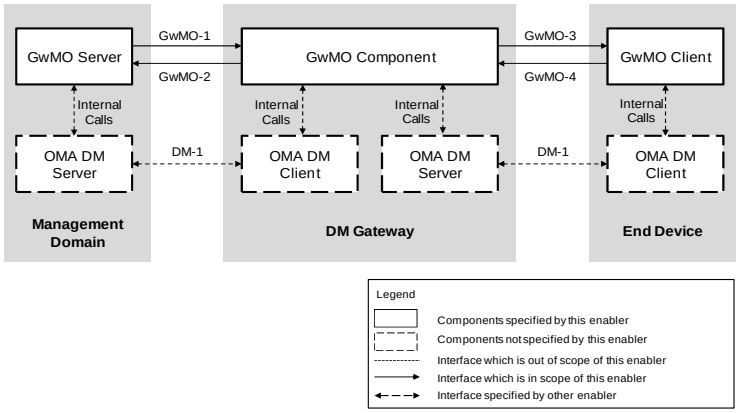

Figure 2: Proxy Mode GwMO Architectural Diagram Using Interfaces

5.2.3 Adaptation Mode

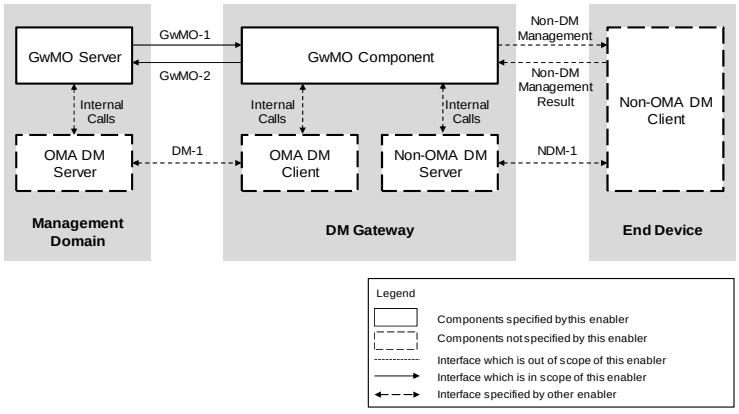

Figure 3: Adaptation Mode GwMO Architectural Diagram Using Interfaces

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5.3 Functional Components and Interfaces/Reference Points Definition

5.3.1 Protocol Endpoints

5.3.1.1 GwMO Server

The GwMO Server is a logical entity that is dedicated to issue GwMO operations to the DM Gateway or consume the GwMO Alerts from the DM Gateway. The GwMO Server interacts with the GwMO Component.

5.3.1.2 GwMO Component

The GwMO Component is the abstract software component that conforms to the requirements for the DM Gateway specified in the OMA GwMO Enabler. The GwMO Component enables the management of the End Devices that are not directly accessible to the OMA DM Server. The GwMO Component supports the following three modes, as specified in the [GwMO-RD]:

- **Transparent Mode**: The DM Gateway assists the DM Server in sending a DM Notification to the End Device(s) behind the DM Gateway. In this mode, the DM Gateway forwards the DM Notification to the End Device(s). The DM Gateway does not participate in the management session that gets established between the DM Server and the End Device after the delivery of the DM Notification to the End Device(s).
- **Proxy Mode**: The DM Gateway manages End Device(s) behind the DM Gateway on behalf of the DM Server over DM protocol. Two related DM sessions are established: one is between the DM Server and the DM Gateway (working as DM Client); the other is between the DM Gateway (working as DM Server) and the End Device(s).
- **Adaptation Mode**: The DM Gateway manages End Device(s) behind the DM Gateway on behalf of the OMA DM Server over a non-OMA-DM protocol.

The DM Gateway can operate in different modes for different devices simultaneously. In Transparent Mode, the GwMO provides fanout of DM Notifications from an OMA DM server to multiple End Devices. In Proxy Mode, the GwMO Component provides other functions, such as fanout of DM Notifications and DM messages from an OMA DM Server to multiple End Devices, and aggregation of responses from multiple End Devices so that a consolidated response is sent back to the OMA DM Server. Additionally, it provides the ability to store configuration data and software images for the End Devices.

5.3.1.3 OMA DM Server

The OMA DM Server is defined in the OMA DM Enabler and is the subject of those specifications.

5.3.1.4 Non-OMA DM Server

The Non-OMA DM Server is the abstract software component that does not conform to the requirements for OMA DM Server specified in the OMA Device Management Enabler. GwMO does not define or specify the Non-OMA DM Server.

5.3.1.5 OMA DM Client

The OMA DM Client is defined in the OMA DM Enabler and is the subject of those specifications.

5.3.1.6 Non-OMA DM Client

The Non-OMA DM Client is the abstract software component that does not conform to the requirements for OMA DM Client specified in the OMA Device Management Enabler. GwMO does not define or specify the Non-OMA DM Client.

5.3.1.7 GwMO Client

GwMO Client is a logical entity that resides in the End Device; it is dedicated to receive DM notifications from the DM Server through the DM Gateway and sends End Device GwMO alerts to the GwMO Server. The GwMO Client interacts with the GwMO Component.

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5.3.2 Interfaces

5.3.2.1 GwMO-1 Interface

The GwMO-1 interface allows a GwMO Server to invoke GwMO Operations on the End Device via the DM Gateway using the underlying DM-1 interface.

5.3.2.2 GwMO-2 Interface

The GwMO-2 interface allows the End Device to send GwMO Alerts to the GwMO Server via the DM Gateway using the underlying DM-1 interface.

5.3.2.3 GwMO-3 Interface

The GwMO-3 interface allows the GwMO component to send notifications to the End Device.

5.3.2.4 GwMO-4 Interface

The GwMO-4 interface allows the DM Client to register its End Device to the DM Gateway. The GwMO Component may send device management commands on behalf of the GwMO Server and the DM Client may return status and alerts to the GwMO Component using the underlying DM-1 interface in Transparent Mode and Proxy Mode, or using the NDM-1 interface in Adaptation Mode.

5.3.2.5 DM-1 Interface

The DM-1 interface is defined in the OMA DM Enabler and is the subject of those specifications. It provides a formal interface over which Servers may send device management commands to Clients and Clients may return status and alerts to Servers.

5.3.2.6 NDM-1 Interface

The NDM-1 interface is defined outside of OMA. It provides an interface over which Servers may send device management commands to Clients and Clients may return status and alerts to Servers using non-OMA DM protocol. This interface is outside the scope of OMA DM.

5.4 Security Considerations

The GwMO Enabler provides mechanism to meet the security requirements addressed in [GwMO-RD].

GwMO supports single authentication mechanism for group of End Devices for notification fanout operation.

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Appendix A. Change History (Informative)

A.1 Approved Version History

Reference	Date	Description
OMA-AD-GwMO-V1_0-20130618-A	18 Jun 2013	Status changed to Approved by TP TP Ref # OMA-TP-2013-0200-INP_GwMO_V1_0_ERP_for_Final_Approval

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Appendix B. GwMO Data Flow Diagram (Informative)

The data flow diagram in Figure 4 identifies the major functionalities provided by the GwMO enabler.

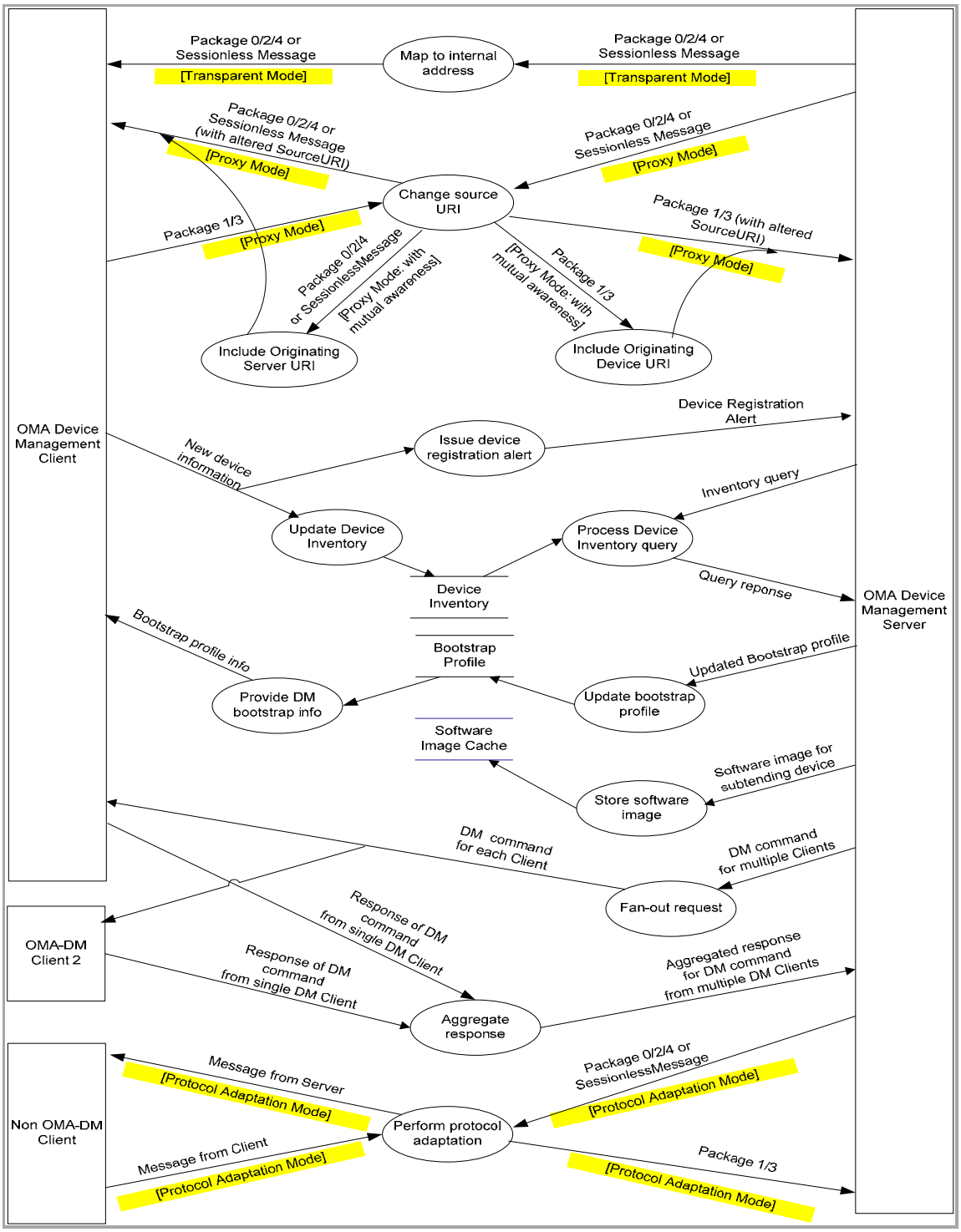

Figure 4: GwMO Data Flow Diagram

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