OCF Resource to Matter Cluster Mapping Specification

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CONTENTS

Figures

Tables

Introduction

This document, and all the other parts associated with this document, were developed in response to worldwide demand for smart home focused Internet of Things (IoT) devices, such as appliances, door locks, security cameras, sensors, and actuators; these to be modelled and securely controlled, locally and remotely, over an IP network.

While some inter-device communication existed, no universal language had been developed for the IoT. Device makers instead had to choose between disparate frameworks, limiting their market share, or developing across multiple ecosystems, increasing their costs. The burden then falls on end users to determine whether the products they want are compatible with the ecosystem they bought into, or find ways to integrate their devices into their network, and try to solve interoperability issues on their own.

In addition to the smart home, IoT deployments in commercial environments are hampered by a lack of security. This issue can be avoided by having a secure IoT communication framework, which this standard solves.

The goal of these documents is then to connect the next 25 billion devices for the IoT, providing secure and reliable device discovery and connectivity across multiple OSs and platforms. There are multiple proposals and forums driving different approaches, but no single solution addresses the majority of key requirements. This document and the associated parts enable industry consolidation around a common, secure, interoperable approach.

The OCF specification suite is made up of eighteen discrete documents, the documents fall into logical groupings as described herein:

- Core framework
  - Core Specification
  - Security Specification
  - Onboarding Tool Specification
- Bridging framework and bridges
  - Bridging Specification
  - Resource to Alljoyn Interface Mapping Specification
  - OCF Resource to oneM2M Resource Mapping Specification
  - OCF Resource to BLE Mapping Specification
  - OCF Resource to EnOcean Mapping Specification
  - OCF Resource to UPlus Mapping Specification
  - OCF Resource to Zigbee Cluster Mapping Specification
  - OCF Resource to Z-Wave Mapping Specification
  - OCF Resource to Matter Cluster Mapping Specification
- Resource and Device models
  - Resource Type Specification
  - Device Specification
- Core framework extensions
  - Easy Setup Specification
  - Core Optional Specification

- OCF Cloud
  - Cloud API for Cloud Services Specification
  - Device to Cloud Services Specification
  - Cloud Security Specification

OCF Resource to Matter Cluster Mapping Specification

1 Scope

This document specifies a framework for translation between OCF devices and other ecosystems, and specifies the behaviour of a translator that exposes servers in non-OCF ecosystem to OCF clients and/or exposes OCF servers to clients in non-OCF ecosystem. Translation per specific device type is described in section XXX (deep translation). This document provides generic requirements that apply unless overridden by a more specific document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Matter Core Specification 1.0
https://csa-iot.org/wp-content/uploads/2022/11/22-27349-001_Matter-1.0-Core-Specification.pdf

Matter Device Library Specification 1.0
https://csa-iot.org/wp-content/uploads/2022/11/22-27351-001_Matter-1.0-Device-Library-Specification.pdf

Matter Application Cluster Specification 1.0
https://csa-iot.org/wp-content/uploads/2022/11/22-27350-001_Matter-1.0-Application-Cluster-Specification.pdf

ISO/IEC 30118-1 Information technology -- Open Connectivity Foundation (OCF) Specification -- Part 1: Core specification
https://www.iso.org/standard/82127.html
Latest version available at: https://openconnectivity.org/specs/OCF_Core_Specification.pdf

ISO/IEC 30118-2 Information technology – Open Connectivity Foundation (OCF) Specification – Part 2: Security specification
https://www.iso.org/standard/82128.html
Latest version available at: https://openconnectivity.org/specs/OCF_Security_Specification.pdf

ISO/IEC 30118-3 Information technology – Open Connectivity Foundation (OCF) Specification – Part 3: Bridging specification
https://www.iso.org/standard/82129.html
Latest version available at: https://openconnectivity.org/specs/OCF_Bridging_Specification.pdf

ISO/IEC 30118-4 Information technology – Open Connectivity Foundation (OCF) Specification – Part 4: Resource Type specification
https://www.iso.org/standard/82130.html
Latest version available at:
https://openconnectivity.org/specs/OCF_Resource_Type_Specification.pdf

ISO/IEC 30118-5 Information technology – Open Connectivity Foundation (OCF) Specification – Part 5: Device specification
https://www.iso.org/standard/82131.html
Latest version available at: https://openconnectivity.org/specs/OCF_Device_Specification.pdf

Derived Models for Interoperability between IoT Ecosystems, Stevens & Merriam, March 2016
https://www.iab.org/wp-content/IAB-uploads/2016/03/OCF-Derived-Models-for-Interoperability-Between-IoT-Ecosystems_v2-examples.pdf

IETF RFC 4122, *A Universally Unique IDentifier (UUID) URN Namespace*, July 2005 https://www.rfc-editor.org/info/rfc4122

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 30118-1, ISO/IEC 30118-2 , and ISO/IEC 30118-3 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at https://www.iso.org/obp
- IEC Electropedia: available at http://www.electropedia.org/

3.1.1 Attribute

A data entity which represents a physical quantity or state. This data is communicated to other Nodes using commands. (a term of Matter)

3.1.2 Bridged Protocol

Other protocol (e.g., Matter) that is being translated to or from OCF protocols

3.1.3 Client

A Cluster interface that typically sends commands that manipulate the attributes on the corresponding server cluster. A client cluster communicates with a corresponding remote server cluster with the same cluster identifier. (a term of Matter)

(OCF and Matter defines "Client" but its meaning is different. If "Client" is used in the context of Matter, it follows this definition)

3.1.4 Cluster

A specification defining one or more attributes, commands, behaviors and dependencies, that supports an independent utility or application function. The term may also be used for an implementation or instance of such a specification on an endpoint. (a term of Matter)

3.1.5 Command

Requests for action on a value with an expected response which may have parameters and a response with a status and parameters. (a term of Matter)

3.1.6 Device Type

In this architecture model, a device type is the highest semantic element. A device type defines conformance for a set of one or more endpoints. A device type defines a set of requirements for the node or endpoint in the market. (a term of Matter)

(OCF and Matter defines "Device Type" but its meaning is different. If "Device Type" is used in the context of Matter, it follows this definition)

3.1.7 Extended Translation

Extended Translation means translation that considers not only Core Resources but also Resources specific to each Device Type.

3.1.8 Endpoint

A Particular component within a Node that is individually addressable. (a term of Matter)

(OCF and Matter defines "Endpoint" but its meaning is different. If "Endpoint" is used in the context of Matter, it follows this definition)

3.1.9 Fabric

A logical collection of communicating Nodes, sharing a common root of trust, and a common distributed configuration state. (a term of Matter)

3.1.10 Node

An addressable entity which supports the Matter protocol stack and (once Commissioned) has its own Operational Node ID and Node Operational credentials. A Device MAY host multiple Nodes. (a term of Matter)

3.1.11 Server

A Cluster interface that typically supports all or most of the attributes of the Cluster. A Server Cluster communicates with a corresponding remote Client Cluster with the same Cluster identifier. (a term of Matter)

(OCF and Matter defines "Server" but its meaning is different. If "Server" is used in the context of Matter, it follows this definition)

3.1.12 Symmetric, Asymmetric Bridging

In symmetric bridging a bridge device not only exposes OCF server to other ecosystem but also exposes other ecosystem’s server to OCF, on the other hand, in asymmetric bridging a bridge device exposes OCF server to other ecosystems only or exposes other ecosystems' server to OCF only.

3.2 Abbreviated terms

CBOR Concise Binary Object Representation

CoAP Constrained Application Protocol

CoAPs Secure Constrained Application Protocol

DTLS Datagram Transport Layer Security

IP Internet Protocol

TLV Tag Length Value

VOD Virtual OCF Device

4 Document conventions and organization

4.1 Conventions

In this document a number of terms, conditions, mechanisms, sequences, parameters, events, states, or similar terms are printed with the first letter of each word in uppercase and the rest lowercase (e.g., Network Architecture). Any lowercase uses of these words have the normal technical English meaning

4.2 Notation

In this document, features are described as required, recommended, allowed or DEPRECATED as follows:

Required (or shall or mandatory).

– These basic features shall be implemented to comply with OIC Core Architecture. The phrases “shall not”, and "PROHIBITED" indicate behaviour that is prohibited, i.e. that if performed means the implementation is not in compliance.

Recommended (or should).

– These features add functionality supported by OIC Core Architecture and should be implemented. Recommended features take advantage of the capabilities OIC Core Architecture, usually without imposing major increase of complexity. Notice that for compliance testing, if a recommended feature is implemented, it shall meet the specified requirements to be in compliance with these guidelines. Some recommended features could become requirements in the future. The phrase "should not" indicates behaviour that is permitted but not recommended.

Allowed (or allowed).

– These features are neither required nor recommended by OIC Core Architecture, but if the feature is implemented, it shall meet the specified requirements to be in compliance with these guidelines.

– Conditionally allowed (CA)The definition or behaviour depends on a condition. If the specified condition is met, then the definition or behaviour is allowed, otherwise it is not allowed.

Conditionally required (CR)

– The definition or behaviour depends on a condition. If the specified condition is met, then the definition or behaviour is required. Otherwise the definition or behaviour is allowed as default unless specifically defined as not allowed.

DEPRECATED

– Although these features are still described in this document, they should not be implemented except for backward compatibility. The occurrence of a deprecated feature during operation of an implementation compliant with the current document has no effect on the implementation’s operation and does not produce any error conditions. Backward compatibility may require that a feature is implemented and functions as specified but it shall never be used by implementations compliant with this document.

Strings that are to be taken literally are enclosed in "double quotes".

Words that are emphasized are printed in *italic*.

5 Matter Translation

5.1 Operational Scenarios

The overall goal of this document is to represent Bridged Matter Servers to OCF Clients as if they were native OCF Servers in the local network or cloud environment.

"Deep translation" between specific Matter Device Type and OCF Device Type is specified in section 9. Figure 1 shows overview of Matter Bridge device and its general topology. The Matter Translator supports Asymmetric Bridging. It exposes Server Clusters of a Matter Device Type to the OCF Clients. As a result, each Bridged Matter Device Type is represented as a Virtual OCF Server.

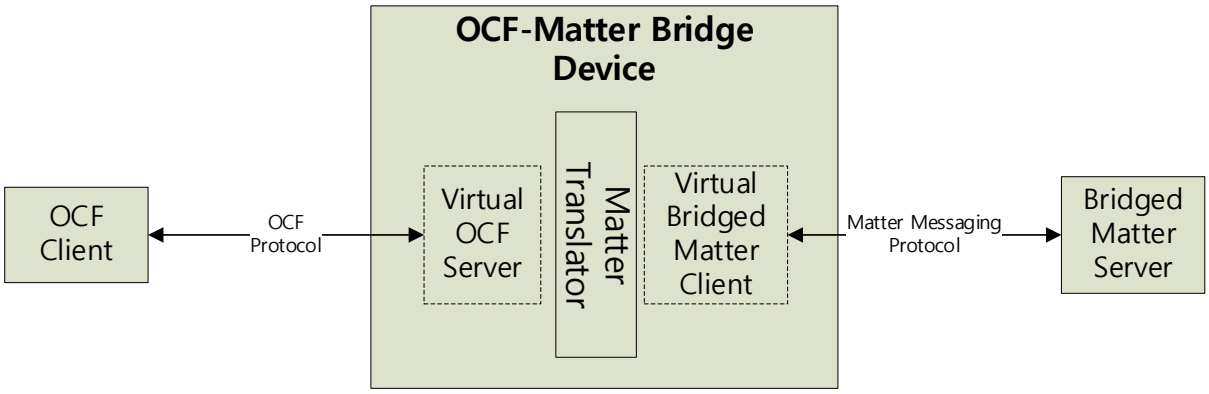

Figure 1 OCF-Matter Bridge Device Components

5.1.1 Use case for Matter Bridging

Figure 2 shows a use case for OCF Clients and Matter Servers. An OCF Client on a smartphone reads a Matter Light bulb Device Type through an OCF-Matter Bridge. Any connectivity that OCF supports is used for communications between the OCF Clients and the OCF-Matter Bridge. The OCF Clients may communicate with the OCF-Matter Bridge through OCF Cloud.

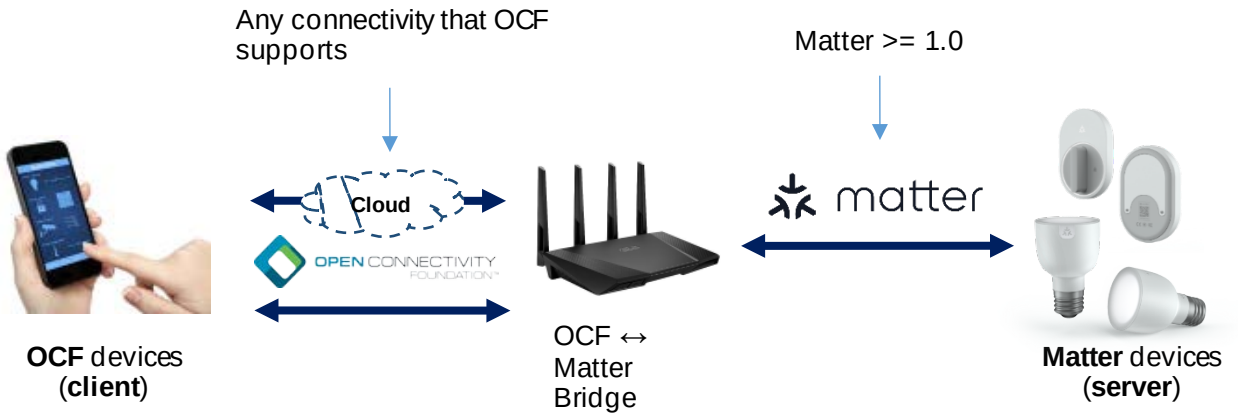

Figure 2 Matter Bridging use case in real life

5.2 Requirements for Matter Translator

5.2.1 Introduction

OCF-Matter Bridge device shall satisfy section 5.2 General Requirements of OCF Bridging Specification.

A Matter translator supports Asymmetric Bridging. It exposes Server Clusters of Matter Device Types to OCF Clients only. Therefore, it shall implement Matter Client Clusters and OCF Server. (This requirement ensures that users can expect a certified OCF Bridge device to communicate with any Server Clusters of Matter Device Types, without the need to purchase any additional Matter devices).

5.2.2 Requirements for Matter side

The version of Matter main specification that this document refers to is 1.0 or higher.

5.2.3 Data model mapping between Matter and OCF

In matter, Matter devices organize a logical group called Fabric. A Fabric means a logical collection of communicating Nodes, sharing a common root of trust, and a common distributed configuration state. As a result, a Matter Node can join multiple Fabrics, and may have multiple Node IDs for each Fabric. In contrast, the OCF does not have an equivalent concept for Fabric. Therefore, Fabric ID and Node ID are not the targets to be translated into OCF ecosystem.

Basic translation rule between Matter Cluster model and OCF Resource model is described in Table 1. A Matter Device Type shall be mapped to an OCF Device Type (e.g. an ON/OFF Light (Matter Device ID: 0x0100) is mapped to a OCF Light (OCF Device Type: "oic.d.light")). Each Matter Device Type specifies mandatory Clusters required for the Device Type. Therefore, mandatory Clusters should be mapped to OCF mandatory Resources required for the corresponding OCF Device Type. The attributes of a Cluster shall be mapped to the Properties of an OCF Resource. Lastly, Matter subscription shall be mapped to OCF Observe Notification. Table 2 provides a translation example of this rule.

Table 1 Translation rule between Matter and OCF data model

From Matter	mapping count	To OCF	mapping count
Device Type	**1**	OCF Device	**1**
Cluster	**n**	OCF Resource	**n**
Attribute	**1**	OCF Resource property	**1**
Subscription	**1**	OCF Notification on/off option	**1**

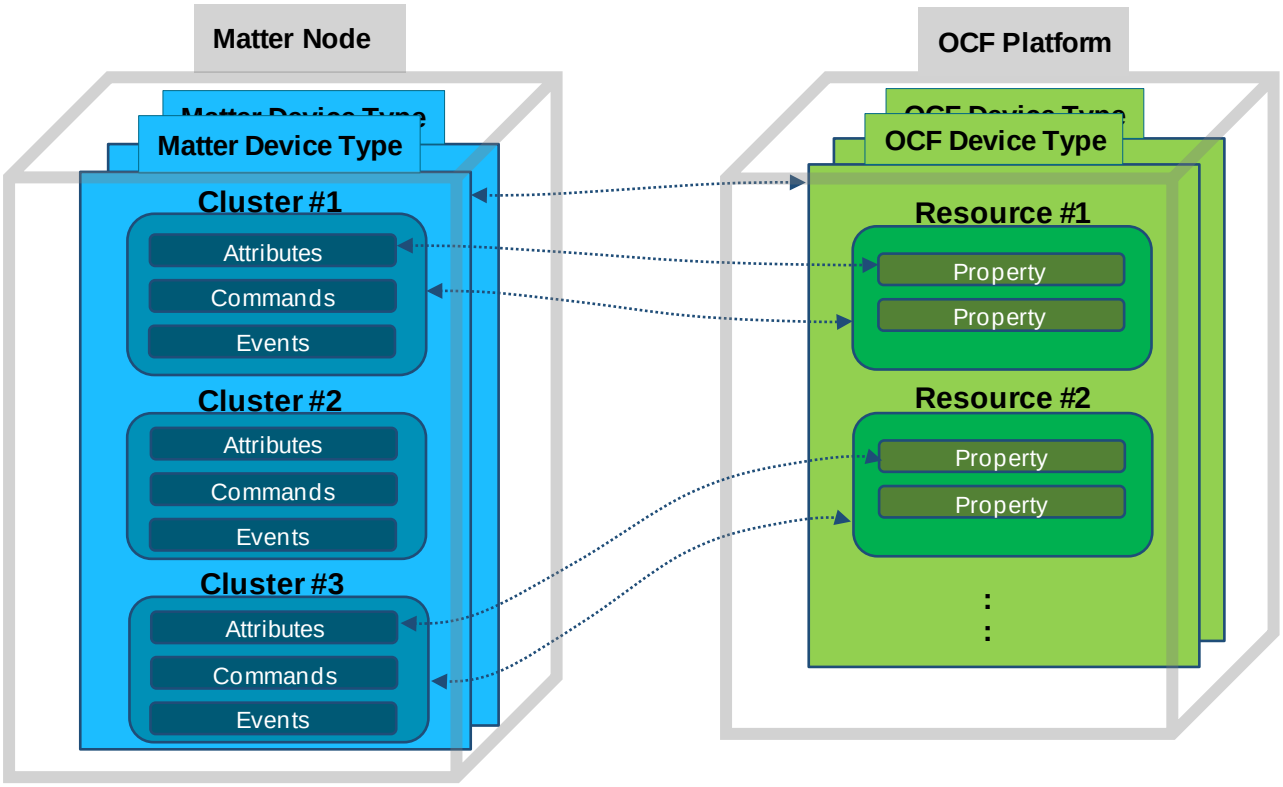

Table 2 Matter → OCF translation example (On/Off Light device)

	Matter	OCF
Matter Device Type → OCF Device	On/Off Light (Device Type ID: 0x0100)	Light (rt: oic.d.light)
Matter Cluster → OCF Resource	On/Off Cluster (Cluster ID: 0x0006)	Binary Switch Resource (rt: oic.r.switch.binary)
	Basic Information Cluster (Cluster ID: 0x0028) Descriptor Cluster (Cluster ID: 0x001D)	Device (rt: oic.wk.d) Platform (rt: oic.wk.p)
Matter Attribute → OCF Resource Property	OnOff (On/Off Cluster)	value (rt: oic.r.switch.binary)

5.2.3.1 Well-defined set of Matter translation

If a Matter Device Type is in a well-defined set (defined in section 9), translation shall be done as follows. Table 3 is the list of Matter Device Type which have corresponding OCF Resources as of now.

Table 3 Matter Cluster – OCF Resource mapping

Matter Device Type	Matter Cluster	OCF Resource Type	OCF Device Type

On/Off Light (Device Type ID: 0x0100)	On/Off Cluster (Cluster ID: 0x0006)	Binary Switch Resource (rt: oic.r.switch.binary)	Light (rt: oic.d.light)
	Basic Information Cluster (Cluster ID: 0x0028) Descriptor Cluster (Cluster ID: 0x001D)	OCF Device (rt: oic.wk.d)	
		OCF Platform (rt: oic.wk.p)	
On/Off Plug-in Unit (Device Type ID: 0x010A)	On/Off Cluster (Cluster ID: 0x0006)	Binary Switch Resource (rt: oic.r.switch.binary)	Smart Plug (rt: oic.d.smartplug)
	Basic Information Cluster (Cluster ID: 0x0028) Descriptor Cluster (Cluster ID: 0x001D)	OCF Device (rt: oic.wk.d)	
		OCF Platform (rt: oic.wk.p)	
Dimmable Light (Device Type ID: 0x0101)	On/Off Cluster (Cluster ID: 0x0006)	Binary Switch Resource (rt: oic.r.switch.binary)	Smart Light (rt: oic.d.light.smart, oic.d.light)
	Level Control Cluster (Cluster ID: 0x0008)	Dimming Resource (rt: oic.r.light.dimming)	
	Basic Information Cluster (Cluster ID: 0x0028) Descriptor Cluster (Cluster ID: 0x001D)	OCF Device (rt: oic.wk.d)	
		OCF Platform (rt: oic.wk.p)	
Thermostat (Device Type ID: 0x0301)	Thermostat (Cluster ID: 0x0201)	Temperature (rt: oic.r.temperature)	Thermostat (rt: oic.d.thermostat)
	Basic Information Cluster (Cluster ID: 0x0028) Descriptor Cluster (Cluster ID: 0x001D)	OCF Device (rt: oic.wk.d)	
		OCF Platform (rt: oic.wk.p)	
Fan (Device Type ID: 0x002B)	Fan Control (Cluster ID: 0x0202)	Binary Switch Resource (rt: oic.r.switch.binary)	Fan (rt:oic.d.fan)
	Basic Information Cluster (Cluster ID: 0x0028) Descriptor Cluster (Cluster ID: 0x001D)	OCF Device (rt: oic.wk.d)	
		OCF Platform (rt: oic.wk.p)	

5.2.3.2 Exposing a Matter Server as a Virtual OCF Server

5.2.3.2.1 Common Properties of OCF Resource Type

- Resource Type (“rt” Property, Mandatory): value of “rt” in corresponding OCF Resource specified in ISO/IEC 30118-4.

- Interface (“if” Property, Mandatory): value of “if” in corresponding OCF Resource specified in ISO/IEC 30118-4.

5.2.3.2.2 Device Resource (“rt” == "oic.wk.d")

Table 4 shows how the Properties of OCF Device Resource, as specified in Table 25 of ISO/IEC 30118-1, shall be derived typically from fields specified in Basic Information Cluster (Cluster ID: 0x0028) and Descriptor Cluster (Cluster ID: 0x001D).

Table 4: Device Resource type ("oic.wk.d") mapping

To OCF Property title	OCF Property name	OCF Description	OCF Mandatory?	From Matter Cluster	Matter Description	Matter Mandatory ?
(Device) Name	n	Human friendly name For example, “Bob’s Thermostat”	Y	Device Type string corresponding to each of **DeviceTypeList** attribute (Descriptor Cluster) + "of" + **NodeLabel** attribute (Basic Information Cluster) If DeviceTypeList includes multiple values, they shall be separated by ','. For example, "On/Off Light of Bob's LivingRoom Light"	**DeviceTypeList** attribute is a list of device types and corresponding revisions declaring endpoint conformance. **NodeLabel** attribute represents a user defined name for the Node.	Y
Spec Version	icv	Spec version of the core specification this device is implemented to, The syntax is "core.major.minor”]	Y	Translator shall return its own value	-	-
Device ID	di	Unique identifier for Device. This value shall be as defined in [ISO/IEC 30118-2] for DeviceID.	Y	Use its VOD's value as defined in the OCF Security Specification	-	-
Protocol-Independent ID	piid	Unique identifier for OCF Device (UUID) . Randomly-generated UUID described in IETF RFC 4122 section 4.4 should be used for piid	Y	Use its own value	-	-
Data Model Version	dmv	Spec version of the Resource specification to which this Device data model is implemented	Y	Use its own value	-	-
Localized Descriptions	ld	Detailed description of the Device, in one or more languages. This property is an array of objects where each object has a ‘language’ field (containing an RFC 5646 language tag) and a ‘value’ field containing the device description in the indicated language.	N	-	-	-
Software Version	sv	Version of the device software.	N	**SoftwareVersionString** attribute (Basic Information Cluster)	**SoftwareVersionString** attribute contains a current human-readable representation for the software running on the Node	Y
Manufacturer Name	dmn	Name of manufacturer of the Device, in one or more languages. This	N	**VendorName** attribute (Basic Information Cluster)	**VendorName** attribute specifies a	Y

		property is an array of objects where each object has a 'language' field (containing an RFC 5646 language tag) and a 'value' field containing the manufacturer name in the indicated language.			human readable (displayable) name of the vendor for the Node.	
Model Number	dmno	Model number as designated by manufacturer.	N	**ProductName** attribute (Basic Information Cluster)	**ProductName** attribute specifies a human readable (displayable) name of the model for the Node such as the model number (or other identifier) assigned by the vendor.	Y

- Spec Version ("icv", Mandatory): Spec version of the core specification that the translator implements shall be used.
- Device ID ("di", Mandatory): "di" value of VOD shall be used. The value of the "di" Property of OCF Devices shall be established during Onboarding procedure of that Virtual OCF Device, as specified in the OCF Security Specification.
- Data Model Version ("dmv", Mandatory): version of data model specification that this Bridge device implements shall be used.
- Protocol Independent ID ("piid", Mandatory): randomly-generated UUID described in IETF RFC 4122 section 4.4 shall be used for piid.

5.2.3.2.3 Device Configuration Resource ("rt" == "oic.wk.con")

The Attributes of Matter Clusters (Descriptor Cluster, Basic Information Cluster) corresponding to the OCF Device configuration Resource (oic.wk.con) are read only, therefore OCF Device configuration Resource (oic.wk.con) shall not be created.

5.2.3.2.4 Platform Resource ("rt" == "oic.wk.p")

Table 5 shows how Platform Properties, as specified in Table 26 in ISO/IEC 30118-1, are derived. Most of them are derived from the attributes of Basic Information Cluster.

Table 5: Platform Resource type (oic.wk.p) mapping

To OCF Property title	OCF Property name	OCF Description	OCF Mandatory?	From Matter Cluster	Matter Description	Matter Mandatory?
Platform ID	pi	Unique identifier for the physical platform (UIUID); this shall be a UUID in accordance with IETF RFC 4122. It is recommended that the UUID be created using the	Y	**Vendor ID** + **Product ID** attribute (Basic Information Cluster)	**Vendor ID** attribute is number that uniquely identifies a particular product manufacturer. **Product ID** attribute is assigned by the vendor that is unique to the specific product of the Node.	Y

		random generation scheme (version 4 UUID) specific in the RFC.				
Manufacturer Name	mnmn	Name of manufacturer (not to exceed 16 characters)	Y	**VendorName** attribute (Basic Information Cluster)	**VendorName** attribute specifies a human readable (displayable) name of the vendor for the Node.	Y
Manufacturer Details Link (URL)	mnml	URL to manufacturer (not to exceed 32 characters)	N	**ProductURL** attribute (Basic Information Cluster)	**ProductURL** attribute specifies a link to a product specific web page.	N
Model Number	mnmo	Model number as designated by manufacturer	N	**ProductName** attribute (Basic Information Cluster)	**ProductName** attribute specifies a human readable (displayable) name of the model for the Node such as the model number (or other identifier) assigned by the vendor.	Y
Date of Manufacture	mndt	Manufacturing date of device	N	**ManufacturingData** attribute (Basic Information Cluster)	**ManufacturingDate** attribute specifies the date that the Node was manufactured	N
Platform Version	mnpv	Version of platform – string (defined by manufacturer)	N	(none)	(none)	-
OS Version	mnos	Version of platform resident OS – string (defined by manufacturer)	N	(none)	(none)	-
Hardware Version	mnhw	Version of platform hardware	N	**HardwareVersionSring** attribute (Basic Information Cluster)	**HardwareVersionString** attribute specifies the version number of the hardware of the Node.	Y
Firmware version	mnfv	Version of device firmware	N	**SoftwareVersionSring** attribute (Basic Information Cluster)	**SoftwareVersionString** attribute contains a current human-readable representation for the software running on the Node.	Y
Support URL	mnsl	URL that points to support information from manufacturer	N	**ProductURL** attribute (Basic Information Cluster)	**ProductURL** attribute specifies a link to a product specific web page.	N
SystemTime	st	Reference time for the device	N	**LocalTime** attribute (Time Synchronization Cluster)	**LocalTime** attribute gives the computed current local time of the server as a epoch-us (CHIP Epoch Time in Microseconds).	N
Vendor ID	vid	Vendor defined string for the platform. The string is freeform and up to the vendor on what text to populate it.	N	**VendorName** attribute (Basic Information Cluster)	**VendorName** attribute specifies a human readable (displayable) name of the vendor for the Node.	Y

- Platform ID (“pi” Property, Mandatory): ProductID attribute composed with VendorID attribute shall be used as the lower 32 bits of Platform ID of the corresponding Platform. Upper 96 bits of the Platform ID shall be filled with 0.

5.2.3.2.5 Platform Configuration Resource ("rt" == "oic.wk.con.p")

The attributes of Matter Clusters (Descriptor Cluster, Basic Information Cluster) corresponding to the OCF Platform configuration Resource (oic.wk.con.p) are read only, therefore OCF Platform configuration Resource (oic.wk.con.p) shall not be created.

5.2.3.2.6 Diagnostics and maintenance Resource ("rt" == "oic.wk.mnt")

There is no specific Matter Cluster for OCF Diagnostics and maintenance Resource (related to factory reset, reboot, etc.), so mapping for OCF Diagnostics and maintenance Resource is omitted. But a manufacturer may create this Resource by using vendor-specific way supported by specific Matter device.

5.2.3.3 On-the-fly Translation

If a Matter Device Type is not in Table 3 (not belong to a well-defined set), a Matter Translator shall not translate it (on-the-fly translation is not supported).

5.2.4 Protocol translation between Matter and OCF

Matter provides "interaction model layer" which defines interactions among Nodes. An interaction is a sequence of one or more transactions between Nodes and a transaction is a sequence of actions. [section 8 of Matter Application Cluster Specification 1.0]

Matter also defines its own "message layer" to carry actions and their data from/to above interaction model layer. The message exchange (sub) layer multiplexes multiple concurrent transactions over a Message session layer. Each of actions comprising a transaction is encoded/decoded in Matter TLV (Tag Length Value) format in message encode/decode (sub) layer.

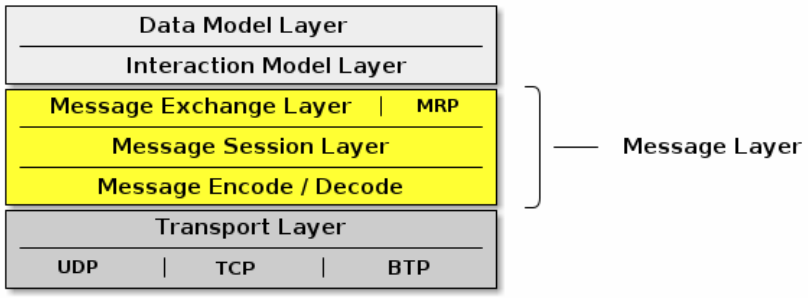

Figure 3 Matter Message Layer Stack [Matter Core Specification 1.0]

Table 6 shows translation rules between Matter interaction model and OCF CRUDN. When a Matter Translator receives a CREATE/DELETE request from an OCF client, it shall return corresponding error (4.xx or 5.xx) because there is no corresponding Matter interaction for them. If a Matter Translator receives a RETRIEVE/UPDATE request from an OCF client, it shall translate it into a Read/Write interaction respectively and it may invoke additional commands of corresponding Cluster if necessary. A NOTIFY request from an OCF client shall be translated into a subscribe transaction and following report transactions from the Matter server shall be translated into NOTIFICATION responses.

Table 6 Protocol translation rule between Matter and OCF

Matter Interaction Model	OCF CRUDN
-	CREATE
Read Interaction [and/or Invoke Interaction]	RETRIEVE
Write Interaction [and/or Invoke Interaction]	UPDATE
-	DELETE
Subscribe Interaction	NOTIFY

5.2.4.1 Initialization

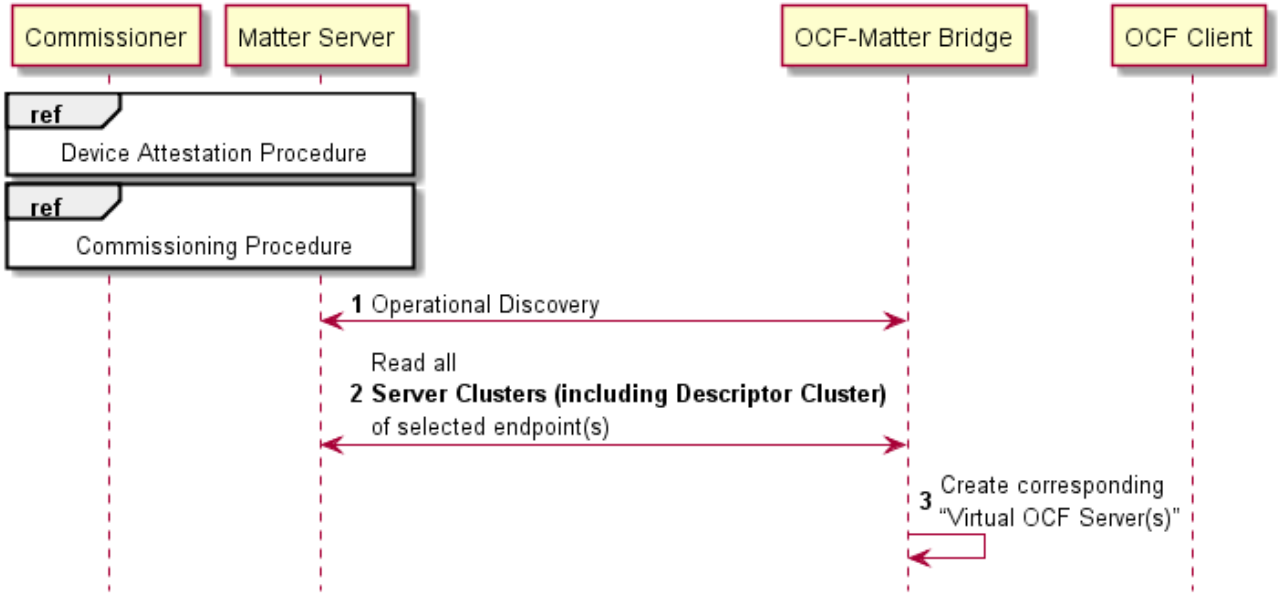

Figure 4 Initialization

Step 1. The Matter Bridge does operational discovery to discover already commissioned Matter Nodes

Step 2. Let admin of Matter Bridge select target Matter device(s) to be bridged, then The Matter Bridge reads all Server Clusters of selected target Matter device on selected endpoint(s)

Step 3. The Matter Bridge creates new VOD corresponding to the target Matter device(s)

5.2.4.2 Resource Discovery

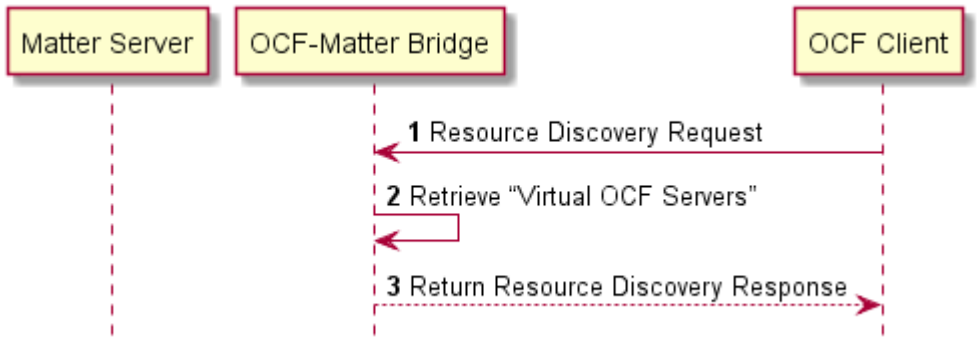

Figure 5 Resource Discovery

5.2.4.3 Create Resource

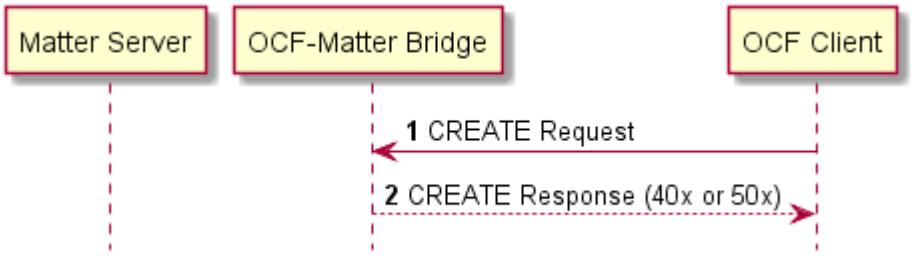

Figure 6 Create Resource

5.2.4.4 Retrieve Resource

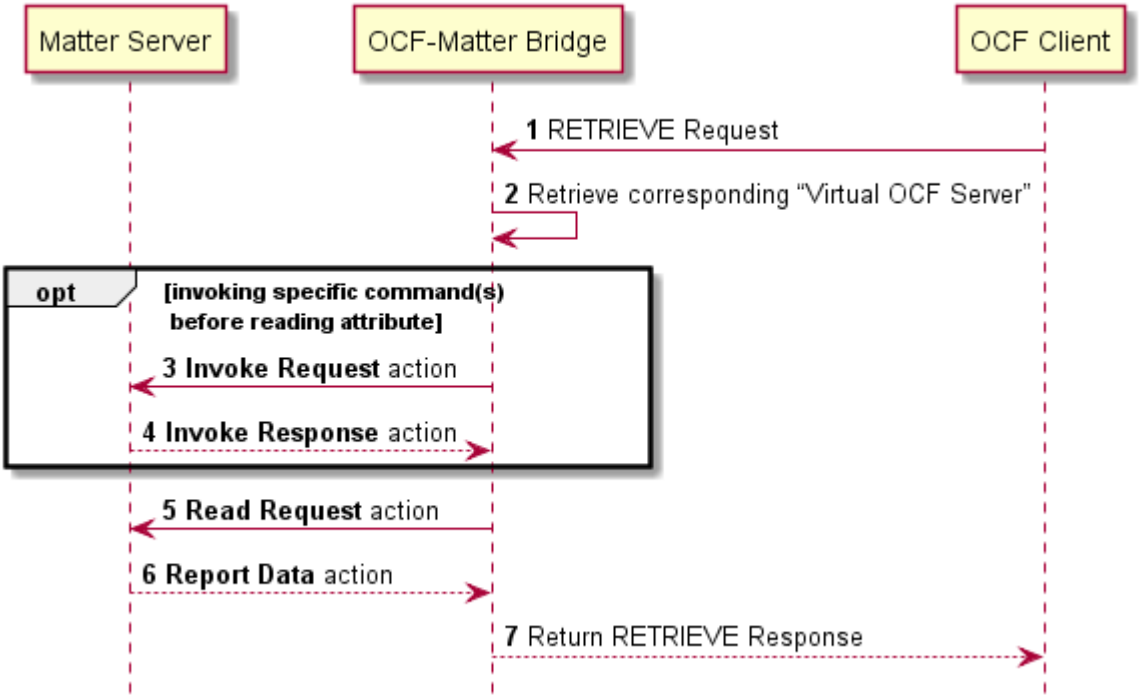

Figure 7 Retrieve Resource

Step 3. If invoking specific command of corresponding cluster is necessary to get valid attribute value, the Matter Bridge triggers invoke transaction for the specific command.

Step 4. ~ Step 5. If the invoke request action is successful, the Matter Bridge triggers read transaction.

5.2.4.5 Update Resource

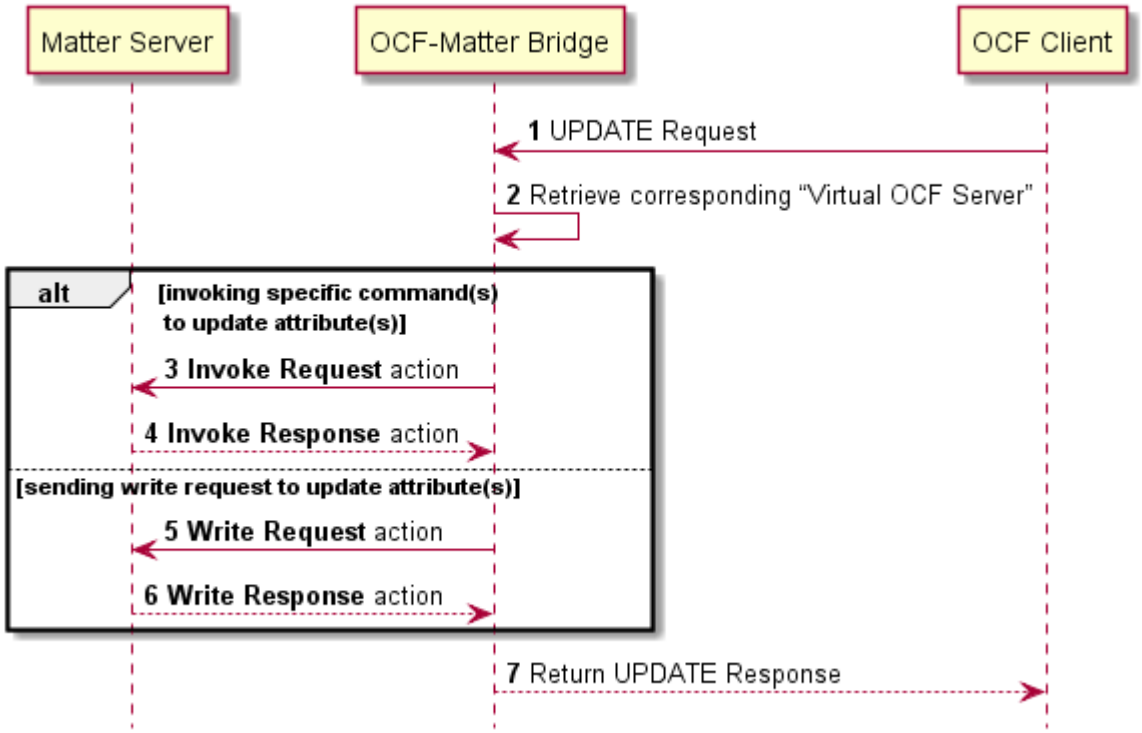

Figure 8 Update Resource

Step 3. ~ Step 4. If invoking specific command of corresponding cluster is necessary to update specific attribute value, the Matter Bridge triggers invoke transaction for the specific command.

Step 5. ~ Step 6. If the target attribute(s) is writable, the Matter Bridge triggers write transaction.

5.2.4.6 Delete Resource

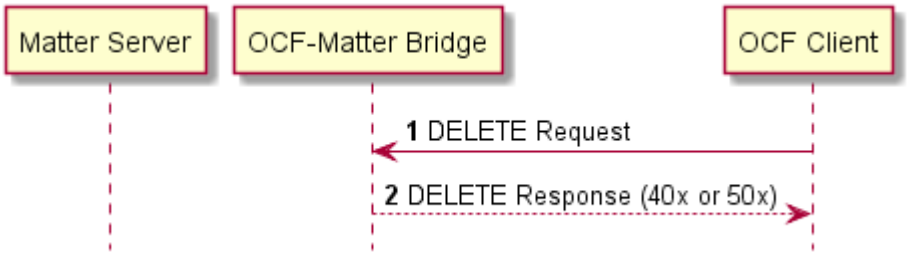

Figure 9 Delete Resource

5.2.4.7 Set Notification & Send Notification

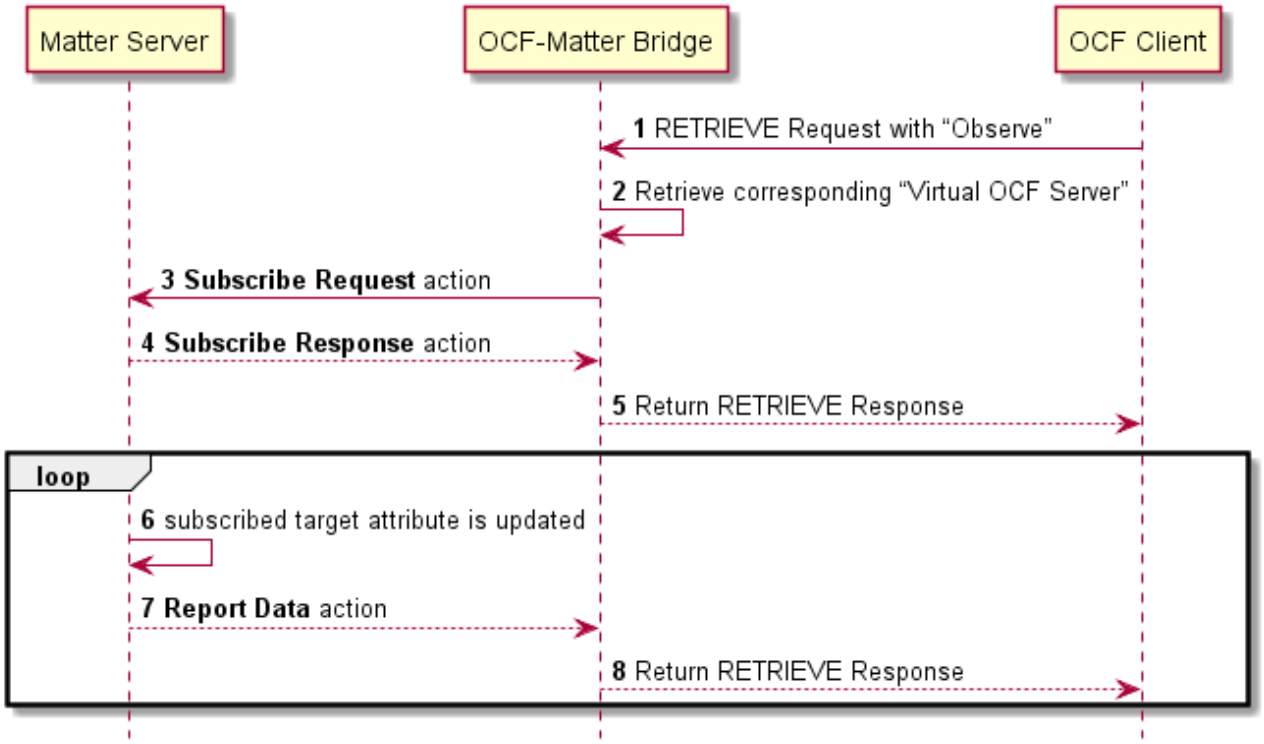

Figure 10 Set Notification & Send Notification

5.2.4.8 Error handling

If a corresponding Matter Interaction fails, the translator shall send an appropriate OCF error response to the OCF Client. it constructs an appropriate OCF error message (e.g., diagnostic payload if using CoAP) from the Matter error event name and error code (if any), using the form "<error name>: <error message>", with the <error name> taken from the event name of corresponding Cluster and the <error message> configured properly by Bridge device manufacturer, and the error code for the OCF network set to an appropriate value.

6 Device Type Mapping

6.1 Mappings between Matter Device Types and OCF Device Types

Table 7 captures the equivalence mappings between Matter Device Types and OCF Device Types. The minimum required set of Resources for each OCF Device is provided in ISO/IEC 30118-5 and minimum required set of Clusters for each Matter device type is provided in Matter Device Library Specification 1.0.

Table 7 – Matter device type to OCF Device Type Mapping

Matter device type	OCF Device Type
On/Off Light (Device Type ID: 0x0100)	Smart Light (rt: oic.d.light.smart, oic.d.light)
On/Off Plug-in Unit (Device Type ID: 0x010A)	Smart Plug (rt: oic.d.smartplug)
Dimmable Light	Smart Light

(Device Type ID: 0x0101)	(rt: oic.d.light.smart, oic.d.light)
Thermostat (Device Type ID: 0x0301)	Thermostat (rt: oic.d.thermostat)
Fan (Device Type ID: 0x002B)	Fan (rt:oic.d.fan)

7 Data Model Mapping

7.1 Mappings between Matter Clusters and OCF Resources

Table 8 captures the equivalence mappings between Matter Clusters and OCF Resource Types (see ISO/IEC 30118-4, Matter Application Cluster Specification 1.0). Detailed mappings between attributes of Matter Cluster and Properties of OCF Resource are provided in clause 9.

Table 8 – Matter Clusters to OCF Resource Mapping

Matter Cluster	OCF Resource Type
On/Off Cluster (Cluster ID: 0x0006)	Binary Switch Resource (rt: oic.r.switch.binary)
Level Control Cluster (Cluster ID: 0x0008)	Dimming Resource (rt: oic.r.light.dimming)
Thermostat (Cluster ID: 0x0201)	Temperature (rt: oic.r.temperature)
Fan Control (Cluster ID: 0x0202)	Binary Switch Resource (rt: oic.r.switch.binary)
Basic Information Cluster (Cluster ID: 0x0028) Descriptor Cluster (Cluster ID: 0x001D)	OCF Device (rt: oic.wk.d)
	OCF Platform (rt: oic.wk.p)

8 Theory of Operation

8.1 Interworking Approach

The mapping between Matter-defined Cluster data model and OCF-defined Resource data model is described using the derived model syntax outlined in "Derived Models for Interoperability between IoT Ecosystems".

8.2 Mapping Syntax

In the syntax defined for derived modelling in this document, there are two blocks that define the actual Property-Property equivalence or mapping. These blocks are identified by the keywords "x-to-ocf" and "x-from-ocf". Derived Models for Interoperability between IoT Ecosystems do not define a rigid syntax for these blocks; they are free-form string arrays that contain pseudo-coded mapping logic.

In this document, Python (version >= 3.0) syntax is used to describe translation rules.

The JSON skeleton shows typical translation block used in the derived models.

```
"<Matter Cluster Name>" : {
   "type": "object",
   "properties": {
      "<an attribute name of the Matter Cluster>" : {
         "x-ocf-conversion" : {
            "x-ocf-alias": "<corresponding Property of the OCF Resource>",
            "x-to-ocf": [
               ...
            ],
            "x-from-ocf": [
               ...
            ]
         }
      }
   }
}
```

– <Matter Cluster Name>: this is the name of a Matter Cluster. If a name hasa space, it shall be removed (e.g. "Fan Control" → "FanControl"). It follows the names defined in "Matter Application Cluster Specification 1.0".

– <an attribute name of the Matter Cluster>: “an attribute name of the Matter Cluster” is a name of an attribute which belongs to the <Matter Cluster Name>. It follows the names defined in "Matter Application Cluster Specification 1.0".

– <corresponding Property of the OCF Resource>: a Property name of the OCF Resource type which is corresponding to the <an attribute name of the Matter Cluster>. Notation rule for this follows clause 4.4 of "ISO/IEC 30118-1".

9 Translation rules per device type

9.1 Introduction

This clause provides mapping descriptions per each Device Type. Mapping descriptions are based on the derived modelling syntax outlined in "Derived Models for Interoperability between IoT Ecosystems".

9.2 On/Off Light

9.2.1 Derived model

The derived model: "OnOffLight.json"

9.2.2 Property definition

Table 1 shows mapping between Matter On/Off Cluster and OCF binary switch Resource. The "OnOff" attribute of On/Off Cluster is read access only, so writing to the "OnOff" attribute can only be done through "On" or "Off" command provided by On/Off Cluster.

Table 9 Mapping for Matter On/Off Cluster

Matter Cluster Attribute name	OCF Resource Property name	To OCF	From OCF

OnOff	oic.r.switch.binary:value	oic.r.switch.binary:value = OnOff	oic.r.switch.binary:value = new_value
			if oic.r.switch.binary:value == True:
			invoke(On)
			else:

			invoke(Off)

Table 10 Corresponding attributes of On/Off Cluster

Matter Cluster Attribute name	Type	Required	Description
OnOff	bool	Yes	The OnOff attribute indicates whether the device type implemented on the endpoint is turned off or turned on, in these cases the value of the OnOff attribute equals FALSE, or TRUE respectively.

9.2.3 Derived model definition

```
{
  "id": "https://github.com/openconnectivityfoundation/OCF-Matter/OnOffLight.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright (c) 2023 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "On/Off Light Device Type",
  "definitions": {
    "OnOff" : {
      "description": "On/Off Cluster includes Attributes and commands for turning devices on and
off",
      "type" : "object",
      "properties": {
        "OnOff": {
          "description": "OnOff attribute indicates whether the device type implemented on the
endpoint is turned off or turned on",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.switch.binary:value",
            "x-to-ocf": [
              "oic.r.switch.binary:value = OnOff"
            ],
            "x-from-ocf": [
              "oic.r.switch.binary:value = new_value",
              "if oic.r.switch.binary:value == True:",
              "  invoke(On)",
              "else:",
              "  invoke(Off)"
            ]
          }
        }
      }
    }
  },

  "type": "object",

  "required": [
    "OnOff"
  ]
}
```

9.3 On/Off Plug-in Unit

9.3.1 Derived model

The derived model: "OnOffPluginUnit.json"

9.3.2 Property definition

Table 3 shows mapping between Matter On/Off Cluster and OCF binary switch Resource. The "OnOff" attribute of On/Off Cluster is read access only, so writing to the "OnOff" attribute can only be done through "On" or "Off" command provided by On/Off Cluster.

Table 11 Mapping for Matter On/Off Cluster

Matter Cluster Attribute name	OCF Resource Property name	To OCF	From OCF

OnOff	oic.r.switch.binary:value	oic.r.switch.binary:value = OnOff	oic.r.switch.binary:value = new_value
			if oic.r.switch.binary:value == True:
			  invoke(On)
			else:
			  invoke(Off)

Table 12 Corresponding attributes of On/Off Cluster

Matter Cluster Attribute name	Type	Required	Description
OnOff	bool	Yes	The OnOff attribute indicates whether the device type implemented on the endpoint is turned off or turned on, in these cases the value of the OnOff attribute equals FALSE, or TRUE respectively.

9.3.3 Derived model definition

```
{
  "id": "https://github.com/openconnectivityfoundation/OCF-Matter/OnOffPluginUnit.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright (c) 2023 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "On/Off Plug-in Unit Device Type",
  "definitions": {
    "OnOff" : {
      "description": "On/Off Cluster includes Attributes and commands for turning devices on and
off",
      "type" : "object",
      "properties": {
        "OnOff": {
          "description": "OnOff attribute indicates whether the device type implemented on the
endpoint is turned off or turned on",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.switch.binary:value",
            "x-to-ocf": [
              "oic.r.switch.binary:value = OnOff"
            ],
            "x-from-ocf": [
              "oic.r.switch.binary:value = new_value",
              "if oic.r.switch.binary:value == True:",
              "  invoke(On)",
              "else:",
              "  invoke(Off)"
            ]
          }
        }
      }
    }
  },
```

```
  "type": "object",

  "required": [
    "OnOff"
  ]
}
```

9.4 Dimmable Light

9.4.1 Derived model

The derived model: "DimmableLight.json"

9.4.2 Property definition

Table 5 shows mapping between Matter On/Off Cluster and OCF binary switch Resource. The "OnOff" attribute of On/Off Cluster is read access only, so writing to the "OnOff" attribute can only be done through "On" or "Off" command provided by On/Off Cluster.

Table 13 Mapping for Matter On/Off Cluster

Matter Cluster Attribute name	OCF Resource Property name	To OCF	From OCF

OnOff	oic.r.switch.binary:value	oic.r.switch.binary:value = OnOff	if oic.r.switch.binary:value == True:
			invoke(On)
			else:
			invoke(Off)

Table 14 Corresponding attributes of On/Off Cluster

Matter Cluster Attribute name	Type	Required	Description
OnOff	bool	Yes	The OnOff attribute indicates whether the device type implemented on the endpoint is turned off or turned on, in these cases the value of the OnOff attribute equals FALSE, or TRUE respectively.

Table 7 shows mapping between Matter Level Control Cluster and OCF dimming Resource. The "CurrentLevel" attribute of Level Control Cluster is read access only, so writing to the "CurrentLevel" attribute can only be done through "MoveToLevel" command provided by Level Control Cluster. "range" Property of "oic.r.light.dimming" Resource is read only, so there is no mapping from OCF. There is no corresponding OCF Property for "OnLevel" attribute, but "OnLevel" is mandatory attribute of Level Control Cluster, so it is updated when "dimmingSetting" of OCF dimming Resource is updated.

Table 15 Mapping for Matter Level Control Cluster

Matter Cluster Attribute name	OCF Resource Property name	To OCF	From OCF
CurrentLevel	oic.r.light.dimming:dimmingSetting	oic.r.light.dimming:dimmingSetting = CurrentLevel	oic.r.light.dimming:dimmingSetting = new_dimmingSetting

			invoke(MoveToLevel(oic.r.light.dimming:dimmingSetting))
MinLevel	oic.r.light.dimming:range[0]	oic.r.light.dimming:range[0] = MinLevel	N/A
MaxLevel	oic.r.light.dimming:range[1]	oic.r.light.dimming:range[1] = MaxLevel	N/A
OnLevel	oic.r.light.dimming:dimmingSetting	N/A	oic.r.light.dimming:dimmingSetting = new_dimmingSetting OnLevel = oic.r.light.dimming:dimmingSetting

Table 16 Corresponding attributes of Level Control Cluster

Matter Cluster Attribute name	Type	Required	Description
CurrentLevel	uint8	Yes	The CurrentLevel attribute represents the current level of this device. The meaning of 'level' is device dependent.
MinLevel	uint8	No	The MinLevel attribute indicates the minimum value of CurrentLevel that is capable of being assigned.
MaxLevel	uint8	No	The MaxLevel attribute indicates the maximum value of CurrentLevel that is capable of being assigned.
OnLevel	uint8	Yes	The OnLevel attribute determines the value that the CurrentLevel attribute is set to when the OnOff attribute of an On/Off cluster on the same endpoint is set to TRUE, as a result of processing an On/Off cluster command.

9.4.3 Derived model definition

```
{
  "id": "https://github.com/openconnectivityfoundation/OCF-Matter/DimmableLight.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright (c) 2023 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "On/Off Light Device Type",
  "definitions": {
    "OnOff" : {
      "description": "On/Off Cluster includes Attributes and commands for turning devices on and
off",
      "type" : "object",
      "properties": {
        "OnOff": {
          "description": "OnOff attribute indicates whether the device type implemented on the
endpoint is turned off or turned on",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.switch.binary:value",
            "x-to-ocf": [
              "oic.r.switch.binary:value = OnOff"
            ],
            "x-from-ocf": [
              "oic.r.switch.binary:value = new_value",
              "if oic.r.switch.binary:value == True:",
              "  invoke(On)",
              "else:",
              "  invoke(Off)"
            ]
          }
        }
      }
    },
```

```
    "LevelControl" : {
      "description": "Level Control cluster provides an interface for controlling a characteristic
of a device that can be set to a level, for example the brightness of a light, the degree of closure
of a door, or the power output of a heater. This Cluster is optional",
      "type" : "object",
      "properties": {
        "CurrentLevel": {
          "description": "CurrentLevel attribute represents the current level of this device. The
meaning of 'level' is device dependent.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.light.dimming:dimmingSetting",
            "x-to-ocf": [
              "oic.r.light.dimming:dimmingSetting = CurrentLevel"
            ],
            "x-from-ocf": [
              "oic.r.light.dimming:dimmingSetting = new_dimmingSetting",
              "invoke(MoveToLevel(oic.r.light.dimming:dimmingSetting))"
            ]
          }
        },
        "MinLevel": {
          "description": "MinLevel attribute indicates the minimum value of CurrentLevel that is
capable of being assigned.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.light.dimming:range",
            "x-to-ocf": [
              "oic.r.light.dimming:range[0] = MinLevel"
            ],
            "x-from-ocf": [
              "N/A"
            ]
          }
        },
        "MaxLevel": {
          "description": "MaxLevel attribute indicates the maximum value of CurrentLevel that is
capable of being assigned.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.light.dimming:range",
            "x-to-ocf": [
              "oic.r.light.dimming:range[1] = MaxLevel"
            ],
            "x-from-ocf": [
              "N/A"
            ]
          }
        },
        "OnLevel": {
          "description": "OnLevel attribute determines the value that the CurrentLevel attribute is
set to when the OnOff attribute of an On/Off cluster on the same endpoint is set to TRUE,",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.light.dimming:dimmingSetting",
            "x-to-ocf": [
              "N/A"
            ],
            "x-from-ocf": [
              "oic.r.light.dimming:dimmingSetting = new_dimmingSetting",
              "OnLevel = oic.r.light.dimming:dimmingSetting"
            ]
          }
        }
      }
    }
  },

  "type": "object",

  "required": [
    "OnOff",
    "CurrentLevel",
    "MinLevel",
```



```
    "OnLevel"
  ]
}
```

9.5 Thermostat

9.5.1 Derived model

The derived model: "Thermostat.json"

9.5.2 Property definition

Table 9 shows mapping between Matter Thermostat Cluster and OCF temperature Resource. "temperature" Property of OCF temperature Resource plays 2 roles (temperature setting or measurement), but Thermostat Cluster has separate attribute for each of them.

The "LocalTemperature" attribute of Thermostat Cluster is read access only, but it is a measured temperature so no mapping for "from OCF" is necessary. On the other hand, "*Setpoint" attributes have read/write access, therefore they can be updated without using command.

Table 17 Mapping for Matter Thermostat Cluster

Matter Cluster Attribute name	OCF Resource Property name	To OCF	From OCF
LocalTemperature	oic.r.temperature:temperature	oic.r.temperature:temperature = LocalTemperature/100	N/A
OccupiedCoolingSetpoint	oic.r.temperature:temperature	oic.r.temperature:temperature = LocalTemperature/100	oic.r.temperature:temperature = new_temperature OccupiedCoolingSetpoint = oic.r.temperature:temperature * 100
OccupiedHeatingSetpoint	oic.r.temperature:temperature	oic.r.temperature:temperature = LocalTemperature/100	oic.r.temperature:temperature = new_temperature OccupiedCoolingSetpoint = oic.r.temperature:temperature * 100
UnoccupiedCoolingSetpoint	oic.r.temperature:temperature	oic.r.temperature:temperature = LocalTemperature/100	oic.r.temperature:temperature = new_temperature OccupiedCoolingSetpoint = oic.r.temperature:temperature * 100
UnoccupiedHeatingSetpoint	oic.r.temperature:temperature	oic.r.temperature:temperature = LocalTemperature/100	oic.r.temperature:temperature = new_temperature OccupiedCoolingSetpoint = oic.r.temperature:temperature * 100

Table 18 Corresponding attributes of Thermostat Cluster

Matter Cluster Attribute name	Type	Required	Description

LocalTemperature	int16 value = (temperature in °C) x 100 this value represents a temperature on the Celsius scale with a resolution of 0.01°C.	Yes	This attribute represents the temperature, as measured locally or remotely (over the network)
OccupiedCoolingSetpoint	int16 value = (temperature in °C) x 100 this value represents a temperature on the Celsius scale with a resolution of 0.01°C.	No	OccupiedCoolingSetpoint attribute specifies the cooling mode setpoint when the room is occupied
OccupiedHeatingSetpoint	int16 value = (temperature in °C) x 100 this value represents a temperature on the Celsius scale with a resolution of 0.01°C.	No	OccupiedHeatingSetpoint attribute specifies the heating mode setpoint when the room is occupied
UnoccupiedCoolingSetpoint	int16 value = (temperature in °C) x 100 this value represents a temperature on the Celsius scale with a resolution of 0.01°C.	No	UnoccupiedCoolingSetpoint attribute specifies the cooling mode setpoint when the room is unoccupied
UnoccupiedHeatingSetpoint	int16 value = (temperature in °C) x 100 this value represents a temperature on the Celsius scale with a resolution of 0.01°C.	No	UnoccupiedHeatingSetpoint attribute specifies the heating mode setpoint when the room is unoccupied.

9.5.3 Derived model definition

```
{
  "id": "https://github.com/openconnectivityfoundation/OCF-Matter/Thermostat.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright (c) 2023 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Thermostat Device Type",
  "definitions": {
    "Thermostat" : {
      "description": "Thermostat cluster provides an interface to the functionality of a
thermostat",
      "type" : "object",
      "properties": {
        "LocalTemperature": {
          "description": "LocalTemperature attribute represents the temperature, as measured locally
or remotely",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.temperature:temperature",
            "x-to-ocf": [
              "oic.r.temperature:temperature = LocalTemperature/100"
            ],
            "x-from-ocf": [
              "N/A"
            ]
          }
```

```
        },
        "OccupiedCoolingSetpoint": {
          "description": "OccupiedCoolingSetpoint attribute specifies the cooling mode setpoint when
the room is occupied",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.temperature:temperature",
            "x-to-ocf": [
              "oic.r.temperature:temperature = OccupiedCoolingSetpoint/100"
            ],
            "x-from-ocf": [
              "oic.r.temperature:temperature = new_temperature",
              "OccupiedCoolingSetpoint = oic.r.temperature:temperature * 100"
            ]
          }
        },
        "OccupiedHeatingSetpoint": {
          "description": "OccupiedHeatingSetpoint attribute specifies the heating mode setpoint when
the room is occupied",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.temperature:temperature",
            "x-to-ocf": [
              "oic.r.temperature:temperature = OccupiedHeatingSetpoint/100"
            ],
            "x-from-ocf": [
              "oic.r.temperature:temperature = new_temperature",
              "OccupiedHeatingSetpoint = oic.r.temperature:temperature * 100"
            ]
          }
        },
        "UnoccupiedCoolingSetpoint": {
          "description": "UnoccupiedCoolingSetpoint attribute specifies the cooling mode setpoint
when the room is unoccupied",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.temperature:temperature",
            "x-to-ocf": [
              "oic.r.temperature:temperature = UnoccupiedCoolingSetpoint/100"
            ],
            "x-from-ocf": [
              "oic.r.temperature:temperature = new_temperature",
              "UnoccupiedCoolingSetpoint = oic.r.temperature:temperature * 100"
            ]
          }
        },
        "UnoccupiedHeatingSetpoint": {
          "description": "UnoccupiedHeatingSetpoint attribute specifies the heating mode setpoint
when the room is unoccupied.",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.temperature:temperature",
            "x-to-ocf": [
              "oic.r.temperature:temperature = UnoccupiedHeatingSetpoint/100"
            ],
            "x-from-ocf": [
              "oic.r.temperature:temperature = new_temperature",
              "UnoccupiedHeatingSetpoint = oic.r.temperature:temperature * 100"
            ]
          }
        }
      }
    }
  },

  "type": "object",

  "required": [
    "LocalTemperature"
  ]
}
```


9.6 Fan

9.6.1 Derived model

The derived model: "Fan.json"

9.6.2 Property definition

Table 11 shows mapping between Matter Fan Control Cluster and OCF binary switch Resource. The "FanMode" attribute of Fan Control Cluster has read/write access, therefore it can be updated without using command. However "FanMode" attribute is enum type, so it is necessary that default mapping rule for "FanMode" when "oic.r.switch.binary:value" is True. In this mapping, a default value of 2 (Medium Speed) is used to map to the True value of "oic.r.switch.binary:value".

Table 19 Mapping for Matter Fan Control Cluster

Matter Cluster Attribute name	OCF Resource Property name	To OCF	From OCF

FanMode	oic.r.switch.binary:value	if FanMode > 0:
		  oic.r.switch.binary:value = True
		else:
		  oic.r.switch.binary:value = False
			oic.r.switch.binary:value = new_value
			
			if oic.r.switch.binary:value > 0:
			  FanMode = 2
			else:
			  FanMode = oic.r.switch.binary:value

Table 20 Corresponding attributes of Fan Control Cluster

Matter Cluster Attribute name	Type	Required	Description
FanMode	enum8	Yes	This attribute indicate the current speed mode of the fan. This attribute is written by the client to indicate a new speed mode of the fan.

9.6.3 Derived model definition

```
{
  "id": "https://github.com/openconnectivityfoundation/OCF-Matter/Fan.json#",
  "$schema": "http://json-schema.org/draft-04/schema#",
  "description" : "Copyright (c) 2023 Open Connectivity Foundation, Inc. All rights reserved.",
  "title": "Fan Device Type",
  "definitions": {
    "FanControl" : {
      "description": "Fan Control cluster specifies an interface to control the speed of a fan",
      "type" : "object",
      "properties": {
        "FanMode": {
          "description": "FanMode attribute indicates the the current speed mode of the fan",
          "x-ocf-conversion": {
            "x-ocf-alias": "oic.r.switch.binary:value",
            "x-to-ocf": [
              "if FanMode > 0:",
              "  oic.r.switch.binary:value = True",
              "else:",
              "  oic.r.switch.binary:value = False"
            ],
            "x-from-ocf": [
              "oic.r.switch.binary:value = new_value",
              "if oic.r.switch.binary:value > 0:",
```

```
              "  FanMode = 2",
              "else:",
              "  FanMode = oic.r.switch.binary:value"
            ]
          }
        }
      }
    }
  },

  "type": "object",

  "required": [
    "FanMode"
  ]
}
```

