

OCF 2.3 – U+ Translation – BTG CR 2502

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2 Normative references

U+ Developer Website

<http://developer.haigeek.com:7900/developercenter/static/index.html#/system/login>

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

3.1.1 U+ Property

A U+ Property describes an aspect or a parameter of a U+ device.

11 U+ Translation

11.1 Operational Scenarios

The goal is to make Bridged U+ Servers appear to OCF Clients as if they were native OCF Servers. “Deep translation” between specific U+ properties and OCF resources is specified in the OCF Resource to U+ Property Mapping Specification.

Figure 1 shows an overview of OCF U+ Bridge Platform and its general topology. The U+ Translator supports asymmetric bridging. It exposes U+ Servers to OCF Clients. Each Bridged U+ Server is represented as a Virtual OCF Server.

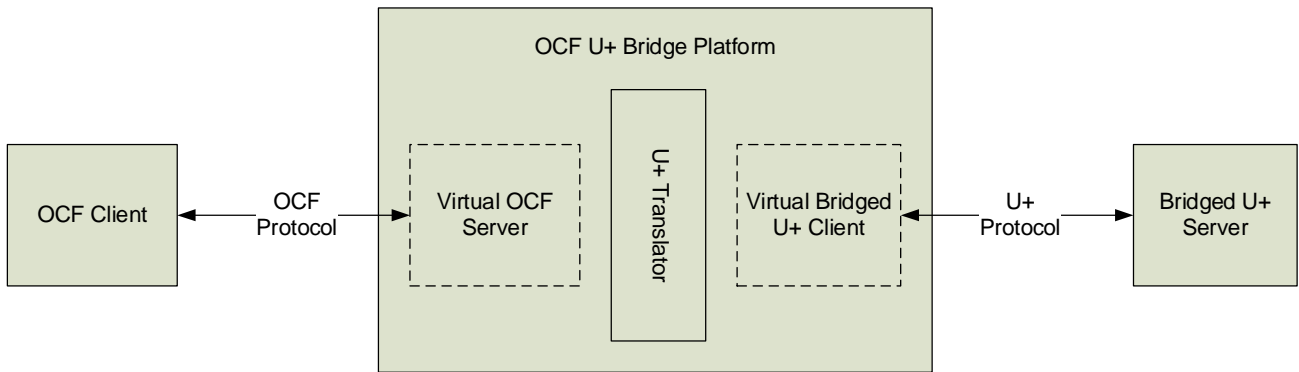


Figure 1 OCF U+ Bridge Platform and Components

11.1.1 Use case for U+ Bridging

Figure 2 shows a use case for U+ bridging. U+ washer air conditioner is installed in the user's house. The user uses OCF client application on the smartphone to control the washer. OCF U+ Bridge Platform can reside in different physical platforms, for example, the smartphone, the washer or the gateway device.

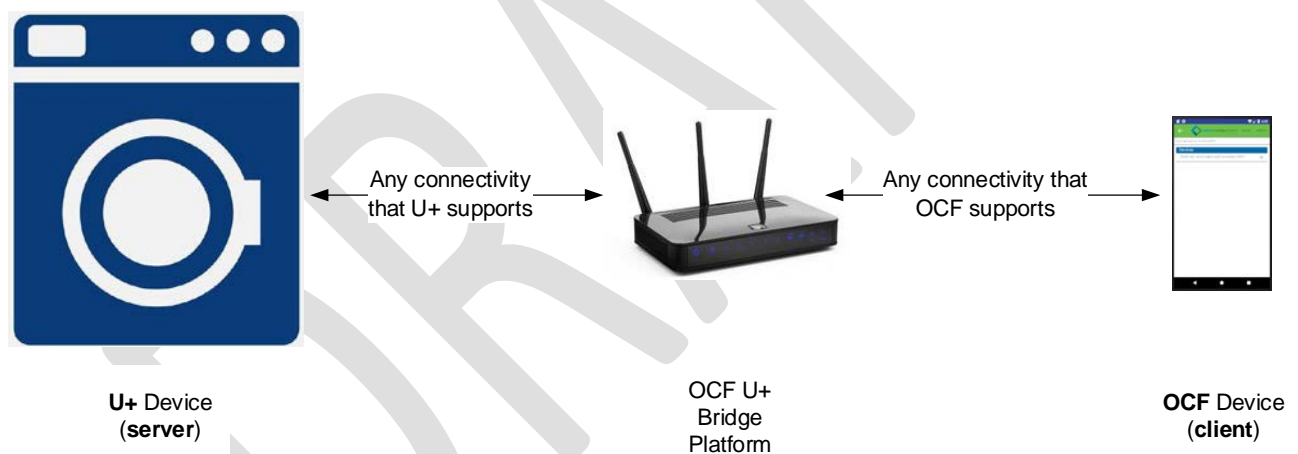


Figure 2 U+ Bridging Use Case

11.2 Requirements specific to U+ Translator

OCF U+ Bridge Platform shall satisfy section X.X General Requirements of OCF Bridging Specification.

11.2.1 Requirements specific to U+

This document refers to version 5.0.0 or higher of U+ SDK (uGW).

11.2.2 Exposing U+ servers to OCF clients

Table 1 shows translation rule between U+ and OCF data model. One U+ Device Type is mapped to one OCF Device Type or one OCF Composite Device. One or more U+ Properties are mapped to one OCF Resource Type.

Table 1 Translation Rule between U+ and OCF Data Model

From U+	mapping count	To OCF	mapping count
U+ Device Type	1	OCF Device Type	1
U+ Property	n	OCF Resource	1
		OCF Property	n

Table 2 shows an example of the translation rule, which maps U+ air conditioner to OCF air conditioner.

- U+ Property “onOffStatus” is mapped to OCF Resource Property “value” which belongs to OCF Resource “oic.r.switch.binary”.
- U+ Property “targetTemperature” is mapped to OCF Resource Property “temperature” and “units” combined which both belong to OCF Resource “oic.r.temperature”.
- U+ Property “indoorTemperature”, “windDirectionVertical”, “windDirectionHorizontal” and “windSpeed” together are mapped to OCF Resource Property “supportedDirections”, “direction”, “speed” and “automode” combined which all belong to OCF Resource “oic.r.airflow”.
- U+ Property “operationMode” and “healthMode” together are mapped to OCF Resource Property “supportedModes” and “modes” combined which both belong to OCF Resource “oic.r.mode”.

Table 2 Example of Translation between U+ and OCF Data Model

From U+ Air Conditioner	To OCF Air Conditioner	
U+ Property	OCF Resource	OCF Resource Property
onOffStatus	oic.r.switch.binary	value
targetTemperature	oic.r.temperature	temperature
		units
indoorTemperature	oic.r.airflow	supportedDirections
windDirectionVertical		direction
windDirectionHorizontal		speed
windSpeed		automode
operationMode	oic.r.mode	supportedModes
healthMode		modes

11.2.2.1 Deep translation for U+ property

All U+ devices are well defined. Table 3 is the mapping between U+ devices and their properties and OCF devices and resources. Table 3 includes a full list of U+ devices to be mapped to OCF. Table 4, 5 and 6 are the mapping between OCF core resources and U+ properties.

Table 1 Mapping between U+ Device and Property and OCF Device and Resource

U+ Device	U+ Property	OCF Resource Type	OCF Device Name	OCF Device Type ("rt")
Air Conditioner	onOffStatus	oic.r.switch.binary	Air Conditioner	oic.d.airconditioner
	targetTemperature	oic.r.temperature		
		oic.r.selectablelevels		
	operationMode	oic.r.mode		
Water Heater	onOffStatus	oic.r.switch.binary	Water Heater	oic.d.waterheater
	targetTemperature	oic.r.temperature		
Air Purifier	onOffStatus	oic.r.switch.binary	Air Purifier	oic.d.airpurifier
	mode	oic.r.operational.state		
	windSpeed	oic.r.selectablelevels		

Table 4 shows the mapping between the properties of "oic.wk.d" Resource Type (Table 25 in OCF Core Specification v2.0) and the properties of U+ device.

Table 4 oic.wk.d Resource Type definition

To OCF Property title	OCF Property name	OCF Description	OCF Mandatory	From U+ Property value	U+ Description	U+ Mandatory
(Device) Name	n	Human friendly name defined by the vendor. In the presence of "n" Property of "/oic/con", both have the same Property Value. When "n" Property Value of "/oic/con" is modified, it shall be reflected to "n" Property Value of "/oic/d".	yes	deviceId	An unique ID of the device	yes
Spec Version	icv	Spec version of the core specification this device is implemented to, The syntax is "ocf.<major>.<minor>.<sub-version>" where <major>, <minor>, and <sub-version> are the major, minor and sub-version numbers of the specification respectively. This version of the specification the string value shall be "ocf.2.0.0".	yes	(none)	Translator returns its own value.	no
Device ID	di	Unique identifier for Device. This value shall be the same value (i.e. mirror) as the doxm.deviceuuid Property as defined in OCF Security. Handling privacy-sensitivity for the "di" Property, refer to section 13.8 in OCF Security.	yes	(none)	As defined in OCF Security Specification	no
Data Model Version	dmv	Spec version of the Resource Specification to which this device data model is implemented; if implemented against a Vertical specific device specification(s), then the Spec version of the vertical	yes	specVersion	Data model version of the device	yes

		specification this device model is implemented to.				
Protocol Independent ID	piid	A unique and immutable Device identifier. A Client can detect that a single Device supports multiple communication protocols if it discovers that the Device uses a single Protocol Independent ID value for all the protocols it supports. Handling privacy-sensitivity for the "piid" Property, refer to section 13.8 in OCF Security.	yes	(none)	Translator returns its own value.	no
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 IETF RFC 5646 language tag) and a 'value' field containing the device description in the indicated language.	no	(none)	(none)	no
Software Version	sv	Version of the device software.	no	swver	Software version of the device	yes
Manufacturer Name	dmn	Name of manufacturer of the Device, in one or more languages. This property is an array of objects where each object has a 'language' field (containing an IETF RFC 5646 language tag) and a 'value' field containing the manufacturer name in the indicated language.	no	manufacturerName	The value of property "manufacturerName" indicates the name of manufacturer.	yes

Model Number	dmno	Model number as designated by manufacturer.	no	modelNumber	The value of property "modelNumber" indicates the model number of the device.	yes
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Table 5 shows the mapping between the properties of "oic.wk.p" Resource Type (Table 26 in OCF Core Specification v2.0) and the properties of U+ device.

Table 5 oic.wk.p Resource Type definition

To OCF Property title	OCF Property name	OCF Description	OCF Mandatory	From U+ Property value	U+ Description	U+ 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 random generation scheme (version 4 UUID) specific in the RFC. Handling privacy-sensitivity for the "pi" Property, refer to section 13.8 in OCF Security.	yes	(none)	Translator generates a UUID as "pi" value.	/
Manufacturer Name	mnmn	Name of manufacturer	yes	manufacturerName	The value of property "manufacturerName" indicates the name of manufacturer.	yes
Model Number	mnmo	Model number as designated by manufacturer	no	modelNumber	The value of property "modelNumber" indicates the model number of the device.	yes

Table 6 shows the mapping between the properties of "oic.wk.con" Resource Type (Table 20 in OCF Core Specification v2.0) and the properties of U+ device.

Table 6 oic.wk.con Resource Type definition

To OCF Property title	OCF Property name	OCF Description	OCF Mandatory	From U+ Property value	U+ Description	U+ Mandatory
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(Device) Name	n	Human friendly name configurable by the end user (e.g. Bob's thermostat). The "n" Common Property of the oic.wk.con Core Resource and the "n" Common Property of the "/oic/d" Core Resource shall have the same Value. When the "n" Common Property Value of the oic.wk.con Core Resource is modified, it shall be reflected to the "n" Common Property of "/oic/d" Core Resource.	yes	deviceid	An unique ID of the device	yes
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11.2.2.2 On-the-fly Translation

If a U+ device is not in the well-defined set, the U+ Translator does not translate it.

11.2.3 Protocol translation between U+ and OCF

U+ framework is based on CoAP protocol. There are three operations defined for handling the properties on U+ device. Table 7 shows the mapping between U+ operations and OCF CRUDN operations.

If a U+ translator receives CREATE or DELETE Request from OCF client, it shall return http status code 405 Method Not Allowed due to no corresponding operation in U+ framework.

Table 7 Mapping of operations between U+ and OCF

U+ operation	OCF CRUDN
Not applicable	CREATE
GET	RETRIEVE
PUT	UPDATE
Not applicable	DELETE
GET (Option: COAP_OPTION_OBSERVE)	NOTIFY

The U+ translator shall translate RETRIEVE Request from OCF client into GET Request to U+ server, and translate corresponding Response from U+ server into RETRIEVE Response back to OCF client, as in Figure 3.

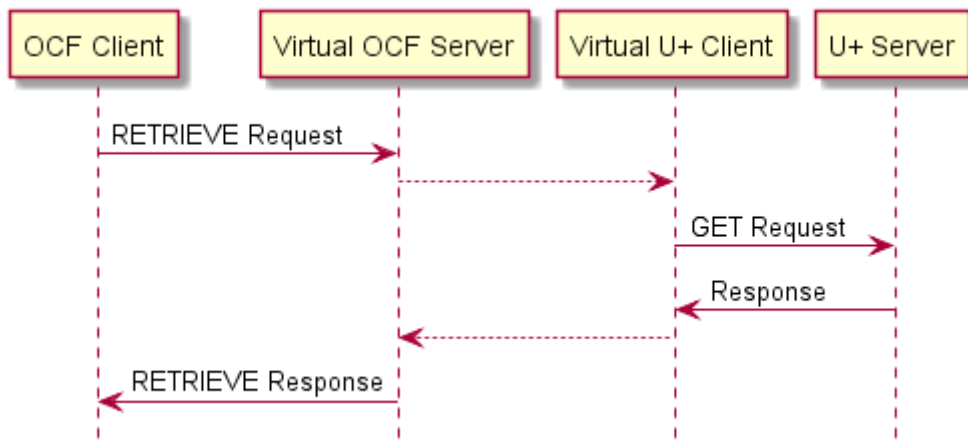


Figure 3 Mapping of RETRIEVE operation

The U+ translator shall translate UPDATE Request from OCF client into PUT Request to U+ server, and translate corresponding Response from U+ server into UPDATE Response back to OCF client, as in Figure 4. The PUT Request shall update all properties needed in the payload, i.e. a full replacement.

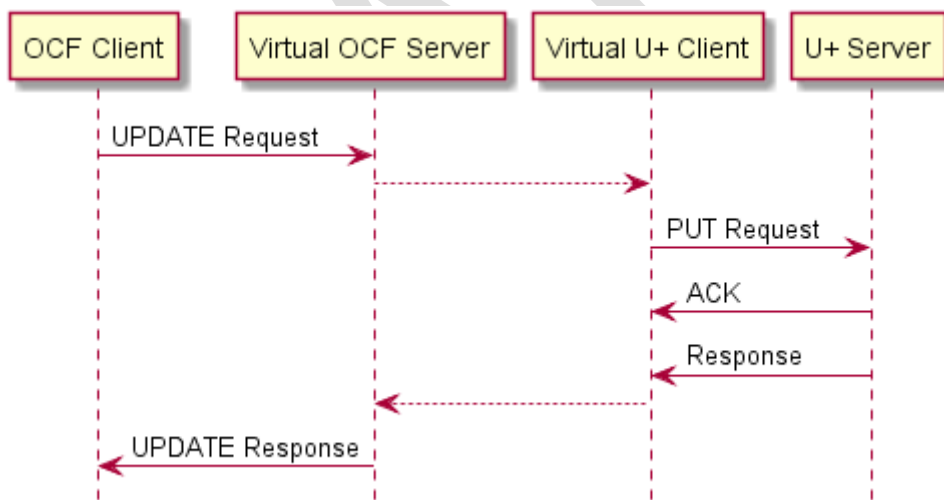


Figure 4 Mapping of UPDATE operation

The U+ translator shall translate RETRIEVE Request (Observe), i.e. Notification, from OCF client into GET Request (Option: COAP_OPTION_OBSERVE) to U+ server, and translate corresponding Response from U+ server into RETRIEVE Response (Observe) back to OCF client, as in Figure 5.

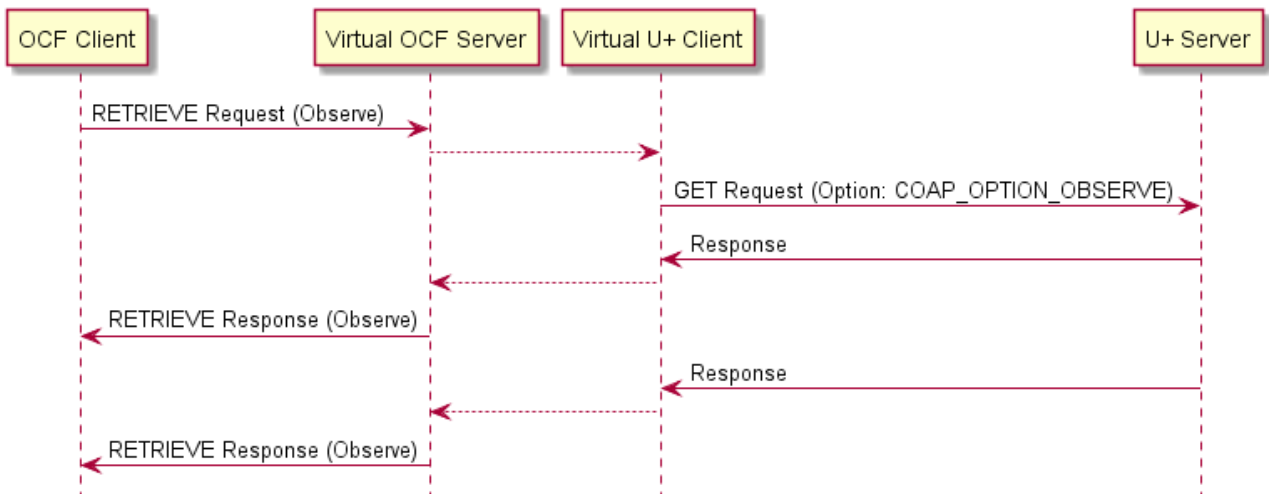


Figure 5 Mapping of NOTIFICATION operation

11.2.3.1 Error Handling

If a U+ operation fails, the translator sends an appropriate OCF error response to the OCF Client.

14 Device Type definitions

No additional definitions are required.

15 Resource Type definitions

Since on-the-fly translation is out of scope, general Resource Type of Collection Resource for U+ devices, e.g. oic.r.uplusobject is not required.