

OCF Resource to UPlus Mapping Specification

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94 **1 Scope**

95 This document provides detailed mapping information between UPlus (U+) and OCF defined
96 Resources.

97 **2 Normative references**

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

102 ISO/IEC 30118-1:2018 Information technology -- Open Connectivity Foundation (OCF)
103 Specification -- Part 1: Core specification
104 <https://www.iso.org/standard/53238.html>
105 Latest version available at: https://openconnectivity.org/specs/OCF_Core_Specification.pdf

106 ISO/IEC 30118-2:2019, Information technology – Open Connectivity Foundation (OCF)
107 Specification – Part 2: Security specification
108 <https://www.iso.org/standard/74239.html>
109 Latest version available at: https://openconnectivity.org/specs/OCF_Security_Specification.pdf

110 ISO/IEC 30118-3:2019, Information technology – Open Connectivity Foundation (OCF)
111 Specification – Part 3: Bridging specification
112 <https://www.iso.org/standard/74240.html>
113 Latest version available at: https://openconnectivity.org/specs/OCF_Bridging_Specification.pdf

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

117 **3 Terms, definitions symbols and abbreviations**

118 For the purposes of this document, the terms and definitions given in ISO/IEC 30118-1:2018,
119 ISO/IEC 30118-2:2019, and ISO/IEC 30118-3:2019 and the following apply.

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

- 122 – ISO Online browsing platform: available at <https://www.iso.org/obp>
- 123 – IEC Electropedia: available at <http://www.electropedia.org/>

124 **4 Document conventions and organization**

125 **4.1 Conventions**

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

130 **4.2 Notation**

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

133 Required (or shall or mandatory).

134 These basic features shall be implemented to comply with the Mapping Specification. The
135 phrases "shall not", and "PROHIBITED" indicate behavior that is prohibited, i.e. that if
136 performed means the implementation is not in compliance.

137 Recommended (or should).

138 These features add functionality supported by the Mapping Specification and should be
139 implemented. Recommended features take advantage of the capabilities the Mapping
140 Specification, usually without imposing major increase of complexity. Notice that for compliance
141 testing, if a recommended feature is implemented, it shall meet the specified requirements to
142 be in compliance with these guidelines. Some recommended features could become
143 requirements in the future. The phrase "should not" indicates behavior that is permitted but not
144 recommended.

145 Allowed (or allowed).

146 These features are neither required nor recommended by the Mapping Specification, but if the
147 feature is implemented, it shall meet the specified requirements to be in compliance with these
148 guidelines.

149 Conditionally allowed (CA)

150 The definition or behaviour depends on a condition. If the specified condition is met, then the
151 definition or behaviour is allowed, otherwise it is not allowed.

152 Conditionally required (CR)

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

156 DEPRECATED

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

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

164 Words that are emphasized are printed in *italic*.

165 **5 Theory of Operation**

166 **5.1 Interworking Approach**

167 The interworking between UPlus (U+) and OCF defined Resources is modelled using the derived
168 model syntax described in Derived Models for Interoperability between IoT Ecosystems.

169 **5.2 Mapping Syntax**

170 **5.2.1 Introduction**

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

176 Within this document we apply the rules in defined in clause 5.2 to these blocks to ensure
177 consistency and re-usability and extensibility of the mapping logic that is defined.

178 **5.2.2 General**

179 All statements are terminated with a carriage return.

180 **5.2.3 Value Assignment**

181 The equals sign (=) is used to assign one value to another. The assignee is on the left of the
182 operator; the value being assigned on the right.

183 **5.2.4 Property Naming**

184 All Property names are identical to the name used by the original model; for example, from the
185 OCF Temperature Resource the Property name "temperature" is used whereas when referred to
186 the derived ecosystem then the semantically equivalent Property name is used.

187 The name of the OCF defined Property is prepended by the ecosystem designator "ocf" to avoid
188 ambiguity (e.g. "ocf.step")

189 **5.2.5 Range**

190 The range on the OCF side is fixed.

191 **5.2.6 Arrays**

192 An array element is indicated by the use of square brackets "[]" with the index of the element
193 contained therein, e.g. range [1]. All arrays start at an index of 0.

194 **5.2.7 Default Mapping**

195 There are cases where the specified mapping is not possible as one or more of the Properties
196 being mapped is optional in the source model. In all such instances a default mapping is provided.
197 (e.g. "transitiontime = 1")

198 **5.2.8 Conditional Mapping**

199 When a mapping is dependent on the meeting of other conditions then the syntax:

200 If "condition", then "mapping".

201 is applied.

202 E.g. if onoff = false, then ocf.value = false

203 **5.2.9 Method Invocation**

204 The invocation of a command from the derived ecosystem as part of the mapping from an OCF
205 Resource is indicated by the use of a double colon "::" delimiter between the applicable resource,
206 service, interface or other construct identifier and the command name. The command name always
207 includes trailing parentheses which would include any parameters should they be passed.

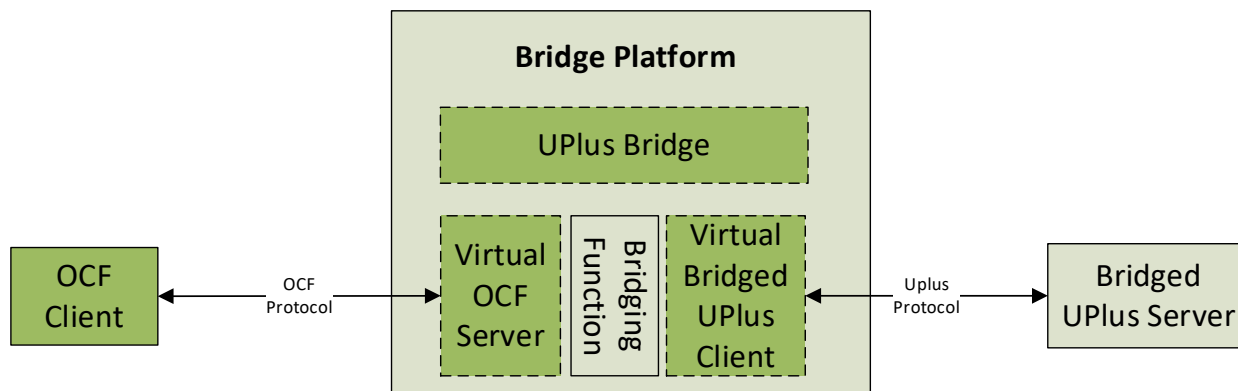
208 **6 U+ Translation**

209 **6.1 Operational Scenarios**

210 **6.1.1 Introduction**

211 The goal is to make Bridged U+ Servers appear to OCF Clients as if they were native OCF Servers.
212 "Deep translation" between specific U+ properties and OCF resources is specified in clause 9.

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

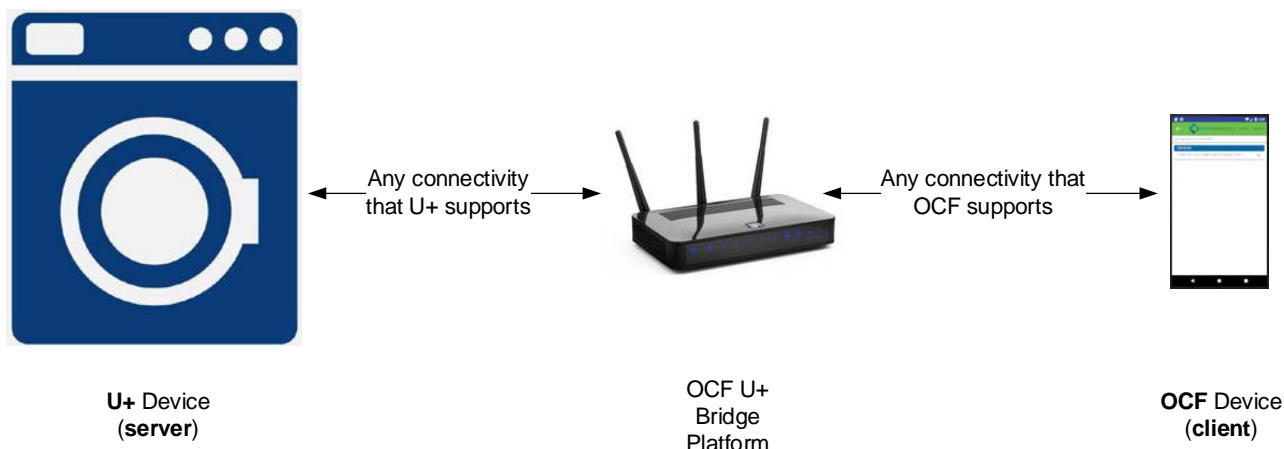


216

217 **Figure 1 – OCF U+ Bridge Platform and Components**

218 **6.1.2 Use case for U+ Bridging**

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



223

224 **Figure 2 – U+ Bridging Use Case**

225 **6.2 Requirements specific to U+ Translator**

226 **6.2.1 General**

227 OCF U+ Bridge Platform shall satisfy the normative requirements from ISO/IEC 30118-3:2019.

228 **6.2.2 Requirements specific to U+**

229 This document refers to version 5.0.0 or higher of U+ SDK.

230 **6.2.3 Exposing U+ servers to OCF Clients**

231 **6.2.3.1 General**

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

235 **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

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

- 238 – U+ Property "onOffStatus" is mapped to OCF Resource Property "value" which belongs to OCF
 239 Resource "oic.r.switch.binary".
- 240 – U+ Property "targetTemperature" is mapped to OCF Resource Property "temperature" and
 241 "units" combined which both belong to OCF Resource "oic.r.temperature".
- 242 – U+ Property "indoorTemperature", "windDirectionVertical", "windDirectionHorizontal" and
 243 "windSpeed" together are mapped to OCF Resource Property "supportedDirections",
 244 "direction", "speed" and "automode" combined which all belong to OCF Resource "oic.r.airflow".
- 245 – U+ Property "operationMode" and "healthMode" together are mapped to OCF Resource
 246 Property "supportedModes" and "modes" combined which both belong to OCF Resource
 247 "oic.r.mode".

248 **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"

249

250 **6.2.3.2 Deep translation for U+ property**

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

Table 3 – 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"		
	"windSpeed"	"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"		

255

256 Table 4 shows the mapping between the properties of "oic.wk.d" Resource Type (see ISO/IEC
257 30118-1:2018) and the properties of U+ device.

258

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 to which this Device is implemented. 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. The string value shall be set to the version of the Core Specification on which the implementation is built (e.g. "ocf.2.0.6").	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 ISO/IEC 30118-2:2019.	Yes	(none)	As defined in ISO/IEC 30118-2:2019	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 specification this Device model is implemented to.	Yes	"specVersion"	Data model version of the Device	Yes
Permanent Immutable 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 Permanent Immutable ID value for all the protocols it supports. Handling privacy-sensitivity for the "piid" Property, refer to ISO/IEC 30118-2:2019	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

259 Table 5 shows the mapping between the properties of "oic.wk.p" Resource Type (see ISO/IEC
260 30118-1:2018) and the properties of U+ device.

261 **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 ISO/IEC 30118-2:2019	Yes	(none)	Translator generates a UUID as "pi" value.	No
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

262 Table 6 shows the mapping between the properties of "oic.wk.con" Resource Type (see ISO/IEC
263 30118-1:2018) 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
(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

265 6.2.3.3 On-the-fly Translation

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

267 6.2.3.4 Protocol translation between U+ and OCF

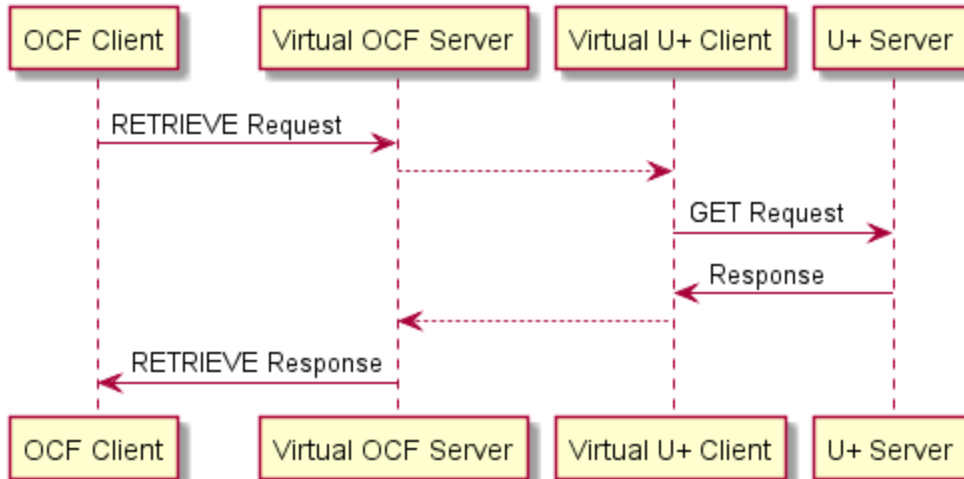
268 U+ framework is based on the CoAP protocol. There are three operations defined for handling the
 269 properties on U+ device. Table 7 shows the mapping between U+ operations and OCF CRUDN
 270 operations.

271 If a U+ translator receives CREATE or DELETE Request from OCF Client, it shall return an error
 272 response indicating "Method Not Allowed" due to no corresponding operation in U+ framework.

273 **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

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

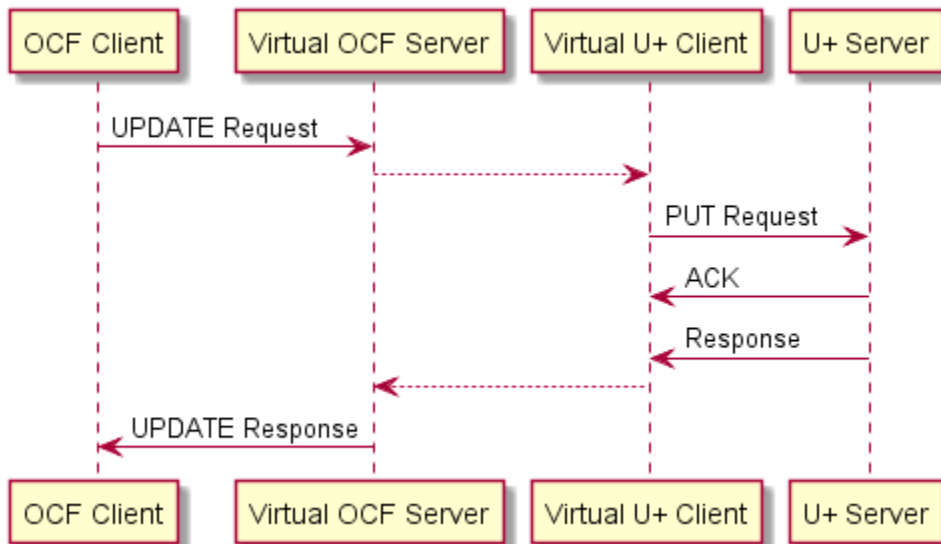


277

278

Figure 3 – Mapping of RETRIEVE operation

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

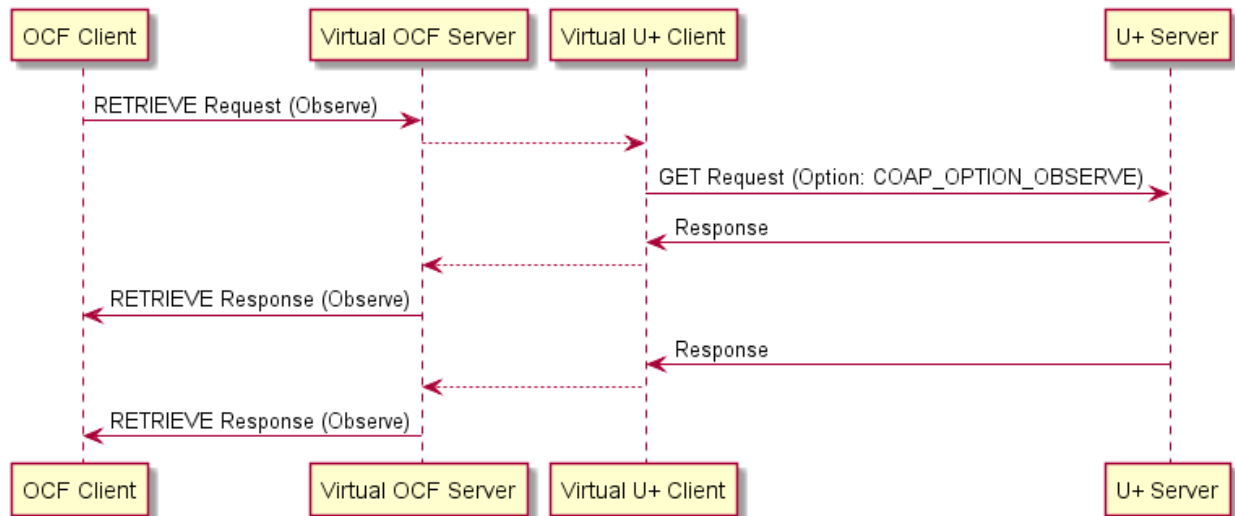


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284

Figure 4 – Mapping of UPDATE operation

285 The U+ translator shall translate RETRIEVE Request (Observe), i.e. Notification, from OCF Client
 286 into GET Request (Option: COAP_OPTION_OBSERVE) to U+ server, and translate corresponding
 287 Response from U+ server into RETRIEVE Response (Observe) back to OCF Client, as in Figure
 288 5.



289

290

Figure 5 – Mapping of NOTIFICATION operation

291 **6.2.3.5 Error Handling**

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

293 **7 Device Type Mapping**

294 **7.1 Introduction**

295 This clause contains the mappings from U+ Device Types to OCF Device Types.

296 **7.2 U+ Device Types to OCF Device Types**

297 Table 8 captures the equivalency mapping between U+ Device Types and OCF Device Types.

298

299

Table 8 – U+ to OCF Device Type Mapping

U+ Device Type	OCF Device Type
Air Conditioner	"oic.d.airconditioner"
Air Purifier	"oic.d.airpurifier"
Water Heater	"oic.d.waterheater"

300 **8 Resource to U+ Property Equivalence**

301 **8.1 Introduction**

302 This clause lists the U+ Properties and provides the equivalent OCF Resource Type(s) to which
 303 the Properties map.

304 **8.2 U+ Property to OCF Resources**

305 Table 9 captures the equivalency mapping between U+ Properties and OCF Resource Types. U+
 306 properties are device type-dependent. The properties with same name may be different within
 307 different device types.

Table 9 – U+ Property to OCF Resource Type Mapping

U+ Device Type	U+ Property	OCF Resource Type Name	OCF Resource Type ID	OCF Interface(s)
Air Conditioner	"onOffStatus"	Binary Switch	"oic.r.switch.binary"	"oic.if.a"
	"targetTemperature"	Temperature	"oic.r.temperature"	"oic.if.s", "oic.if.a"
	"windSpeed"	Selectable Levels	"oic.r.selectablelevels"	"oic.if.a"
	"operationMode"	Mode	"oic.r.mode"	"oic.if.a"
Air Purifier	"onOffStatus"	Binary Switch	"oic.r.switch.binary"	"oic.if.a"
	"windSpeed"	Selectable Levels	"oic.r.selectablelevels"	"oic.if.a"
	"operationMode"	Mode	"oic.r.mode"	"oic.if.a"
Water Heater	"onOffStatus"	Binary Switch	"oic.r.switch.binary"	"oic.if.a"
	"targetTemperature"	Temperature	oic.r.temperature	"oic.if.s", "oic.if.a"

309 9 Detailed Mapping APIs

310 9.1 Introduction

311 This clause provides a Device Type mapping description (using JSON that aligns with the Derived
312 Modelling syntax described in Derived Models for Interoperability between IoT Ecosystems) for all
313 U+ Properties and OCF Resources that are within scope.

314 9.2 Air Conditioner Mapping

315 9.2.1 Derived model

316 The derived model: "uplus.device.airconditioner".

317 9.2.2 Property definition

318 Table 10 provides the detailed per Property mapping for "uplus.device.airconditioner".

319 **Table 10 – The Property mapping for "uplus.device.airconditioner".**

UPlus Property name	OCF Resource	To OCF	From OCF
onOffStatus	oic.r.switch.binary.value	oic.r.switch.value = onOffStatus	onOffStatus=oic.r.switch.value
targetTemperature	oic.r.temperature.temperature	oic.r.temperature.temperature=targetTemperature	targetTemperature=oic.r.temperature.temperature
windSpeed	oic.r.selectablelevels	availablelevels=[1,2,3,4,5]targetlevel=windSpeed	windSpeed=targetlevel
operationMode	oic.r.mode	supportedModes=["Auto","Cool","Dry","Warm","Wind"]modes=supportedModes[operationMode]	operationMode=supportedModes.indexOf(modes)

320 Table 11 provides the details of the Properties that are part of "uplus.device.airconditioner".

Table 11 – The Properties of "uplus.device.airconditioner".

UPlus Property name	Type	Required	Description
onOffStatus	boolean	yes	the switch of air conditioner
targetTemperature	number	yes	target temperature
windSpeed	integer	yes	wind speed
operationMode	integer	yes	

9.2.3 Derived model definition

```

322
323 {
324   "id": "http://openinterconnect.org/uplusocfmapping/schemas/uplus.device.airconditioner.json#",
325   "$schema": "http://json-schema.org/draft-04/schema#",
326   "description": "Copyright (c) 2018 Open Connectivity Foundation, Inc. All rights reserved.",
327   "title": "AirConditioner Mapping",
328   "definitions": {
329     "uplus.device.airconditioner": {
330       "type": "object",
331       "properties": {
332         "onOffStatus": {
333           "type": "boolean",
334           "description": "the switch of air conditioner",
335           "x-ocf-conversion": {
336             "x-ocf-alias": "oic.r.switch.binary.value",
337             "x-to-ocf": [
338               "oic.r.switch.value = onOffStatus"
339             ],
340             "x-from-ocf": [
341               "onOffStatus=oic.r.switch.value"
342             ]
343           }
344         },
345         "targetTemperature": {
346           "type": "number",
347           "description": "target temperature",
348           "x-ocf-conversion": {
349             "x-ocf-alias": "oic.r.temperature.temperature",
350             "x-to-ocf": [
351               "oic.r.temperature.temperature=targetTemperature"
352             ],
353             "x-from-ocf": [
354               "targetTemperature=oic.r.temperature.temperature"
355             ]
356           }
357         },
358         "windSpeed": {
359           "type": "integer",
360           "description": "wind speed",
361           "x-ocf-conversion": {
362             "x-ocf-alias": "oic.r.selectablelevels",
363             "x-to-ocf": [
364               "availablelevels=[1,2,3,4,5]",
365               "targetlevel=windSpeed"
366             ],
367             "x-from-ocf": [
368               "windSpeed=targetlevel"
369             ]
370           }
371         },
372         "operationMode": {
373           "type": "integer",
374           "description": "",
375           "x-ocf-conversion": {
376             "x-ocf-alias": "oic.r.mode",
377             "x-to-ocf": [
378               "supportedModes= [\"Auto\", \"Cool\", \"Dry\", \"Warm\", \"Wind\"]",
379

```

```

380         "modes=supportedModes[operationMode]"
381     ],
382     "x-from-ocf": [
383         "operationMode= supportedModes.indexOf(modes)"
384     ]
385     }
386 }
387 }
388 }
389 },
390 "type": "object",
391 "allOf": [
392     {"$ref": "#/definitions/uplus.device.airconditioner"}
393 ],
394 "required": ["onOffStatus", "targetTemperature", "windSpeed", "operationMode"]
395 }

```

396 9.3 Air Purifier Mapping

397 9.3.1 Derived model

398 The derived model: "uplus.device.airpurifier".

399 9.3.2 Property definition

400 Table 12 provides the detailed per Property mapping for "uplus.device.airpurifier".

401 **Table 12 – The Property mapping for "uplus.device.airpurifier".**

UPlus Property name	OCF Resource	To OCF	From OCF
onOffStatus	oic.r.switch.binary	oic.r.switch.value = onOffStatus	onOffStatus = oic.r.switch.value
windSpeed	oic.r.selectablelevels	availablelevels=[0,1,2,3,4]targetlevel=windSpeed	windSpeed=targetlevel
operationMode	oic.r.mode	supportedModes=["Auto","Quiet","Sleep"]modes=supportedModes[operationMode]	operationMode=supportedModes.indexOf(modes)

402 Table 13 provides the details of the Properties that are part of "uplus.device.airpurifier".

403 **Table 13 – The Properties of "uplus.device.airpurifier".**

UPlus Property name	Type	Required	Description
onOffStatus	boolean	yes	the switch of air purifier
windSpeed	integer	yes	wind speed
operationMode	integer	yes	

404 9.3.3 Derived model definition

```

405 {
406     "id": "http://openinterconnect.org/uplusocfmapping/schemas/uplus.device.airpurifier.json#",
407     "$schema": "http://json-schema.org/draft-04/schema#",
408     "description": "Copyright (c) 2018 Open Connectivity Foundation, Inc. All rights reserved.",
409     "title": "AirPurifier Mapping",
410     "definitions": {
411         "uplus.device.airpurifier": {
412             "type": "object",
413             "properties": {
414                 "onOffStatus": {
415                     "type": "boolean",
416                     "description": "the switch of air purifier",
417                     "x-ocf-conversion": {
418                         "x-ocf-alias": "oic.r.switch.binary.value",

```

```

419         "x-to-ocf": [
420             "oic.r.switch.value = onOffStatus"
421         ],
422         "x-from-ocf": [
423             "onOffStatus = oic.r.switch.value"
424         ]
425     }
426 },
427     "windSpeed": {
428         "type": "integer" ,
429
430         "description": "wind speed",
431         "x-ocf-conversion": {
432             "x-ocf-alias": "oic.r.selectablelevels",
433             "x-to-ocf": [
434                 "availablelevels=[0,1,2,3,4]",
435                 "targetlevel=windSpeed"
436             ],
437             "x-from-ocf": [
438                 "windSpeed=targetlevel"
439             ]
440         }
441     },
442     "operationMode": {
443         "type": "integer" ,
444         "description": "",
445         "x-ocf-conversion": {
446             "x-ocf-alias": "oic.r.mode",
447             "x-to-ocf": [
448                 "supportedModes= [\"Auto\", \"Quiet\", \"Sleep\"]",
449                 "modes=supportedModes[operationMode]"
450             ],
451             "x-from-ocf": [
452                 "operationMode= supportedModes.indexOf(modes)"
453             ]
454         }
455     }
456 }
457 },
458 },
459 "type": "object",
460 "allOf": [
461     {"$ref": "#/definitions/uplus.device.airpurifier"}
462 ],
463 "required": ["onOffStatus", "windSpeed", "operationMode"]
464 }

```

465 9.4 Water Heater Mapping

466 9.4.1 Derived model

467 The derived model: "uplus.device.waterheater".

468 9.4.2 Property definition

469 Table 14 provides the detailed per Property mapping for "uplus.device.waterheater".

470 **Table 14 – The Property mapping for "uplus.device.waterheater".**

UPlus Property name	OCF Resource	To OCF	From OCF
onOffStatus	oic.r.switch.binary	oic.r.switch.binary.value = onOffStatus	onOffStatus = oic.r.switch.binary.value
targetTemperature	oic.r.temperature.temperature	oic.r.temperature.temperature=targetTemperature	targetTemperature=oic.r.temperature.temperature

471 Table 15 provides the details of the Properties that are part of "uplus.device.waterheater".

Table 15 – The Properties of "uplus.device.waterheater".

UPlus Property name	Type	Required	Description
onOffStatus	boolean	yes	the switch of water heater
targetTemperature	number	yes	target temperature

473 9.4.3 Derived model definition

```

474 {
475   "id": "http://openinterconnect.org/uplusocfmapping/schemas/uplus.device.waterheater.json#",
476   "$schema": "http://json-schema.org/draft-04/schema#",
477   "description": "Copyright (c) 2018 Open Connectivity Foundation, Inc. All rights reserved.",
478   "title": "WaterHeater Mapping",
479   "definitions": {
480     "uplus.device.waterheater": {
481       "type": "object",
482       "properties": {
483         "onOffStatus": {
484           "type": "boolean",
485           "description": "the switch of water heater",
486           "x-ocf-conversion": {
487             "x-ocf-alias": "oic.r.switch.binary.value",
488             "x-to-ocf": [
489               "oic.r.switch.binary.value = onOffStatus"
490             ],
491             "x-from-ocf": [
492               "onOffStatus = oic.r.switch.binary.value"
493             ]
494           }
495         },
496         "targetTemperature": {
497           "type": "number",
498           "description": "target temperature",
499           "x-ocf-conversion": {
500             "x-ocf-alias": "oic.r.temperature.temperature",
501             "x-to-ocf": [
502               "oic.r.temperature.temperature=targetTemperature"
503             ],
504             "x-from-ocf": [
505               "targetTemperature=oic.r.temperature.temperature"
506             ]
507           }
508         }
509       }
510     }
511   },
512   "type": "object",
513   "allOf": [
514     {"$ref": "#/definitions/uplus.device.warterheater"}
515   ],
516   "required": ["onOffStatus", "targetTemperature"]
517 }
518 
```