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Information technology — Open Connectivity Foundation (OCF) Specification

Part 4: Resource type specification

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Partie 4: Spécification des types de ressources

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This document was prepared by the Open Connectivity Foundation (OCF) (as the OCF Resource Type Specification, Version 1.0.0) and drafted in accordance with its editorial rules. It was adopted, under the JTC 1 PAS procedure, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

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1 Scope

The OCF Resource Type Specification specifies the Resources that have been defined by OCF that may be exposed by an OCF Device.

Application profile device specifications (for example those created for Smart Home or Healthcare) specify device types appropriate to the profile; such specifications use Resource Type definitions from this document.

This specification is built on top of the OCF Core Specification. The OCF Core Specification specifies the OCF Framework that enables the implementation of profiles for IoT usages and ecosystems. The OCF Core Framework is scalable to support simple devices (constrained device) and more capable devices (smart device).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

OCF Core Specification, *Open Connectivity Foundation Core Specification*, Version 1.0.0.

JSON SCHEMA, *JSON Schema: Core Definitions and Terminology*, Version 4.0, http://json-schema.org/latest/json-schema-core.html.

RAML, *Restful API modelling language*, Version 0.8.

https://github.com/raml-org/raml-spec/blob/master/versions/raml-08/raml-08.md

ISO 8601:2004, *Data elements and interchange formats – information interchange – Representation of dates and times*.

CIE CIE159:2004, *A colour appearance model for colour management systems: CIECAM02*, January 19, 2004.

http://www.cie.co.at/index.php/Publications/index.php?i_ca_id=435

Swagger2.0, *Swagger RESTful API Documentation Specification*, Version 2.0

http://swagger.io/specification/

OCF Resource Type Definitions, *API Definition Language for OCF Resource Type Definitions,* Release OCF-v1.0.0

https://github.com/OpenInterConnect/IoTDataModels

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

3.1.1
Actuator
Resource with support of the UPDATE operation.

3.1.2
Composite Resource Type
A Resource Type defined as an OCF Collection of other Resource Types.

3.1.3
Sensor
Resource without support of the UPDATE operation.

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3.2 Symbols and abbreviations

3.2.1
CRUDN
Create Retrieve Update Delete Notify
This is an acronym indicating which operations are possible on the Resource.

3.2.2
CSV
Comma Separated Value List
Comma Separated Value List is a construction to have more fields in 1 string separated by commas. If a value contains a comma then the comma can be escaped by adding "\" in front of the comma.

3.2.3
OCF
Open Connectivity Foundation
OCF is the standards organization which created and owns this specification.

3.2.4
RAML
RESTful API modelling language
RAML is a simple and succinct way of describing RESTful APIs. See RAML for further details.

3.2.5
REST
Representational State Transfer
REST is an architecture style for designing networked applications and relies on a stateless, client-server, cacheable communications protocol.

3.2.6
TBD
To Be Determined

3.3 Conventions

In this specification 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., Resource Type). Any lowercase uses of these words have the normal technical English meaning.

4 Document conventions and organization

This document lists all the Resource Types currently specified by OCF. The Resources are used by application profile device definitions. The Resource Types mentioned in this document can be used by any OCF conforming device in any OCF Collection or device representation.

For the purposes of this document, the terms and definitions given in OCF Core Specification apply.

4.1 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 OCF Resource Type Specification. 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).

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These features add functionality supported by the OCF Resource Type Specification and should be implemented. Recommended features take advantage of the capabilities of the OCF Resource Type Specification, 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 OCF Resource Type Specification, but if the feature is implemented, it shall meet the specified requirements to be in compliance with these guidelines.

DEPRECATED

Although these features are still described in this specification, they should not be implemented except for backward compatibility. The occurrence of a deprecated feature during operation of an implementation compliant with the current specification 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 specification.

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.

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

Words that are emphasized are printed in *italic*.

4.2 Data types

This specification adopts the types defined in the OCF Core Specification with the exceptions defined in this Section

All Properties in this specification that are defined as JSON number type shall be transmitted encoded as floating point values and not integer values. Reception of Properties defined as JSON number type shall be as defined in the OCF Core Specification. See OCF Core Specification Section 12.3 for specifics.

5 Baseline Model Constructs

5.1 URI

The URIs mentioned in this document are non-normative, they may be vendor defined.

An Instance of a Resource is indicated by the URI. When more than one instance of the same Resource Type is used in an OCF Device, different URIs for the different Resource instances shall be used.

An implementation shall follow the requirements defined in the OCF Core Specification with respect to population of the URI. Please refer to the OCF Core Specification Sections 6.2 and 6.3 for specific details.

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5.2 Interfaces

The OCF Core Specification specifies that all Resource Types have associated with them at least one Interface; this Interface is advertised during Resource discovery. In addition the OCF Core Specification defines a number of Interfaces that can be applied to an instance of a Resource Type.

The Default Interface associated with all Resource Types defined in this specification shall be the supported interface listed first within the applicable enumeration in the definition of the Resource Type (see Section 6 Resource Type definitions); with an exception being when a Resource Type definition has either Sensor or Actuator interfaces as the Default Interface, in this instance an implementation shall select one of them as the default. Thus a Server hosting such a Resource Type shall enable either oic.if.s (if a Sensor) or oic.if.a (if an Actuator) as the Interface that is exposed via "/oic/res" in addition to the mandated baseline interface ("oic.if.baseline"). A Server may also support other Interfaces in addition to the one specified as the default.

Note that the functionality associated with, or visibility of, an instance of any Resource exposed by a Device may be restricted depending upon local (per country or legislative region) regulatory requirements or other restrictions (e.g. with respect to Binary Switch in some jurisdictions the ability to remotely power on a connected device is restricted; a lock status could be read-only depending on the context). In such cases the Device shall not expose the actuator interface for the Resource ("oic.if.a"), the Device shall expose the Resource in "/oic/res" with the Sensor Interface ("oic.if.s") as the Default Interface in addition to any mandated interfaces.

5.3 RAML definition

The RAML definitions used in this document are normative. By extension all defined JSON payloads shall comply with the indicated JSON schema. Note that the defined schemas have extensions that include all OCF Core Specification defined (and mandated) Properties.

The RAML definitions are used to describe the payloads of the CRUDN operations on the specified Resource Type. The CRUDN operations are defined in the OCF Core Specification. The OCF Core Specification also specifies additional Properties in the payloads of the CRUDN operations. The RAML definitions in this document are not of themselves sufficient to create an implementation, additional Properties defined in the Core specification need to be added to create a compliant implementation. This specification makes use of a subset of the responses supported by RAML specifics on the use of these responses are defined in Table 5-4 Return codes behaviour in RAML. Note that the actual values of success and error conditions are defined in the OCF Core Specification.

The RAML definitions map the OCF CRUDN behaviour to the RAML as defined in Table 5-1.

Table 5-1 Conversion between OCF CRUDN and RAML definitions[1]

Resource	Create	Retrieve	Update	Delete	Notify
/example	put or post	get	put or post	delete	

Notify is not part of an RAML definition but is defined in the Core specification. The semantics of a Notify are the same as the CRUDN Read value. All Resource Types defined in this specification support notification via the use of observe as defined in OCF Core Specification Section 11.4.2.

[1] Please refer to OCF Core Specification Table 26 for detailed semantics around the appropriate use of CoAP request methods

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5.4 Property definition

5.4.1 Common Properties

The OCF Core Specification specifies a number of Properties that may be defined for OCF Resources. The Common Properties “if” and “rt” shall be specified for all Resource Types defined in this specification; they are exposed within the OCF Core Specification defined /oic/res/ Resource Type through which the OCF Server and its available Resources are discovered. The Common Properties “p” and “n” may be specified for all Resource Types defined in this specification.

If an OCF Client requires that these Properties be included in a Resource representation that is provided in response to a RETRIEVE operation then the client shall select the OCF Core Specification defined baseline interface (oic.if.baseline) by specifying this in a query parameter.

Table 5-2 Common Properties for OCF Resources

Property Name	Property Title	Property Value	Value Type	Access Modes	Description
`if`	Interface	See OCF Core Specification Section 7.6.2	Array of string	Readonly	Core defined; Interface(s) supported by the Resource
`rt`	Resource type	See OCF Core Specification Section 7.4	Array of string	Readonly	Core defined; Resource type. The Resource Types are defined in this document. See Section 6
`n`	Name	See OCF Core Specification Section 7.3.2.5	string	Readonly	Core defined; human understandable name for the Resource.
`id`	Resource Identity	See OCF Core Specification Section 7.3.2.6	string	Readonly	Core defined; Unique identifier of the Resource (over all Resources in the OCF device)

5.4.2 Resource Properties

The Properties against which the CRUDN operations are specified are defined with JSON schemas (see JSON SCHEMA).

A basic Resource Type is formulated around one single value denoting a physical property.

Such a Resource Type is specified with the Properties as defined Table 5-3. Mandatory in the table means that the Property shall be defined as part of the overall Resource Type schema; actual inclusion of the Property as part of a returned or generated payload is dependent upon the schema that applies to the operation being invoked.

Table 5-3 Property definitions of a Resource Type in the JSON schema

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Property Name	Friendly Alias Name	Property Value	Value Type	Value Rules	Access Modes	Mandatory	Description
<value>,name may change dependent on the Resource	<value>, name may change dependent on the Resource	Dependent on the Resource	Dependent on the Resource	Dependent on the Resource	Dependent on the Resource	yes	The current value of the Resource
range	Range	[Min,Max]	array	Linear range	Read-only	no	Range of input values, specified as a two element array.
step	Step	Dependent on the Resource	Integer or Number	Dependent on the Resource	Read-only	no	Step value across the defined range
precision	Precision	Dependent on the Resource	Number	Dependent on the Resource	Read-only	no	Accuracy granularity of the exposed value

For Resources, which by their nature have more than one physical parameter, the value Property can be replaced with multiple Properties specifying the different physical parameters. The type of the value shall be indicated in the RAML definition of the Resource Type and should be suitable for the conveyed value. All Property Names and Property Values defined in this specification are case sensitive.

5.4.3 Basic Resource Schema

All Resource Types defined herein are represented as previously noted by JSON schemas. The RAML definitions of the Resource Types embed the Resource Type specific schema elements.

5.4.4 CRUDN Operation Response Codes

A Resource can be created or updated depending on the Resource Type definition and the allowed CRUDN operations. The operation may have different response codes with different meanings. This is explained in Table 5-4.

Table 5-4 Return codes behaviour in RAML

Response Code	Meaning
200	Payload of the response will confirm the change. The RAML definition will contain a schema to define the payload.

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201	Payload is the URL of the Resource that was created by the server as a result of a CREATE operation. The RAML definition will contain schema to define the payload.
204	Ok, everything went well, no payload provided. The RAML definition does not contain a schema. The RAML definition may even omit this value, since it is regarded as default behaviour of an OCF Server.
403	Case 1: In the case of a RETRIEVE on a Resource with the use of a query parameter selecting specific Property values; if the server does not support the values provided then this response should be returned. The response payload should include the allowed values for the query parameter. Case 2: The server could not CREATE or UPDATE the Resource due to a problem with the provided payload. For an UPDATE, unless otherwise stated in the Resource Type definition, the response payload should include the same schema defined for a 200; indicating the current Resource Property value(s).

5.5 Example Resource Definitions

Table 5-5 RAML example of an Resource representing an Actuator

```
#%RAML 0.8
title: OCFExampleActuator
version: v1.0

/ActuatorExample:
  description: |
    ResourceActuatorExample description.
    If the ActuatorExample is implemented as the example in the RAML the next values apply:
    The name of the Resource is “ResourceExample Name”
    The Resource Type is “oic.r.actuatorexample”
    The Interface (if) is denoting an Actuator by having the value oic.if.a.
    The unique identification is “actuator_example_id”
    The value of the ActuatorExample is modeled as integer
    The range of the value of ActuatorExample is between 0 and 100
  get:
    description: |
      retrieves the example Resource.
    responses:
      200:
        body:
          application/json:
```


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```
            schema: |
              {
               "id": "http://openinterconnect.org/schemas/oic.r.actuatorexample.json",
               "$schema": "http://json-schema.org/draft-04/schema#",
               "title": "AcutatorExample",
               "definitions": {
                 "oic.r.actuatorexample: {
                   "type": "object",
                   "properties": {
                     "value": { "type": "string" },
                     "range": {
                       "type": "array",
                       "items": {
                          "type": "integer"
                       }
                     }
                   }
                 }
               },
               "type": "object",
               "allOf": [
                 {"$ref": "oic.core.json#/definitions/oic.core"},
                 {"$ref": oic.baseResource.json#/definitions/oic.r.baseresource"},
                 {"$ref": "#/definitions/oic.r.actuatorexample"}
               ],
               "required": ["value"]
             }
            example: |
              {
                "n":     "ActuatorExample Name",
                "id":    "actuator_example_id",
                "rt":    ["oic.r.actuatorexample"],
                "value": "0",
                "range": ["0,100"]
              }
  post:
    description: |
      sets the Actuator value
      example only updates the value of the Resource
      it does not change the Resource name, although it is allowed to do so.
    body:
      applicaton/json:
        schema: |
             {
               "id": "http://openinterconnect.org/schemas/oic.r.actuatorexample.json",
               "$schema": "http://json-schema.org/draft-04/schema#",
               "title": "AcutatorExample",
               "definitions": {
                 "oic.r.actuatorexample": {
                   "type": "object",
                   "properties": {
                     "value": { "type": "string" },
                     "range": {
                       "type": "array",
                       "items": {
                          "type": "integer"
                       }
                     }
                   }
                 }
               },
               "type": "object",
               "allOf": [
                 {"$ref": "oic.core.json#/definitions/oic.core"},
                 {"$ref": "oic.baseResource.json#/definitions/oic.r.baseresource"},
                 {"$ref": "#/definitions/oic.r.actuatorexample"}
```


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```
                ],
                "required": ["value"]
              }
        example: |
            {
              "id":    "actuator_example_id",
              "value" : 5
            }
    responses:
      200:
        body:
          application/json:
            schema: |
              {
               "id": "http://openinterconnect.org/schemas/oic.r.actuatorexample.json",
               "$schema": "http://json-schema.org/draft-04/schema#",
               "title": "AcutatorExample",
               "definitions": {
                 "oic.r.actuatorexample": {
                   "type": "object",
                   "properties": {
                     "value": { "type": "string" },
                     "range": {
                       "type": "array",
                       "items": {
                          "type": "integer"
                       }
                     }
                   }
                 }
               },
               "type": "object",
               "allOf": [
                 {"$ref": "oic.core.json#/definitions/oic.core"},
                 {"$ref": "oic.baseResource.json#/definitions/oic.r.baseresource"},
                 {"$ref": "#/definitions/oic.r.actuatorexample"}
               ],
               "required": ["value"]
              }
            example: |
              {
                 "id":    "actuator_example_id",
                 "value": 5
              }


      204:
```

Table 5-6 RAML example of an Resource specifying a Sensor

```
#%RAML 0.8
title: OCFExampleSensor
version: v1.0


/SensorExample:
  description: |
    SensorExample description.
    If the SensorExample is implemented as the example in the RAML the next values apply:
    The name of the Resource is “ResourceExample_Name”
    The Resource Type is “oic.r.sensorexample”
```


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```
    The Interface (if) is denoting a Sensor by having the value oic.if.s.
    The unique identification is “sensor_example_id”
    The value of the ResourceSensorExample is modeled as integer
  get:
    description: |
      retrieves the example Resource.
    responses:
      200:
        body:
          application/json:
            schema: |
              {
               "id": "http://openinterconnect.org/schemas/oic.r.sensorexample.json",
               "$schema": "http://json-schema.org/draft-04/schema#",
               "title": "SensorExample",
               "definitions": {
                 "oic.r.sensorexample": {
                   "type": "object",
                   "properties": {
                     "value": { "type": "string" },
                     "range": {
                       "type": "array",
                       "items": {
                          "type": "integer"
                       }
                     }
                   }
                 }
               },
               "type": "object",
               "allOf": [
                 {"$ref": "oic.core.json#/definitions/oic.core"},
                 {"$ref": "oic.baseResource.json#/definitions/oic.r.baseresource"},
                 {"$ref": "#/definitions/oic.r.sensorexample"},
               ],
               "required": ["value"]
             }
            example: |
              {
                "n":     "SensorExample_Name",
                "rt":    ["oic.r.sensorexample"],
                "id":    "sensor_example_id",
                "value": "3"
              }
```

5.6 Observable Resource Types

The OCF Core Specification defines a mechanism by which Resources can advertise themselves as “Observable” to an OCF Client. All Resource Types defined in this specification may be observed. Whether or not a Resource Type is made observable via use of the Policy Link Parameter is entirely implementation dependent.

5.6.1 Conditional Notification

All observable Resources may apply conditions to the generation of notifications that result from the observe action, these conditions can be time based or value based or time and value based. This is achieved by composing the Conditional Notification (oic.r.value.conditional) Resource Type with an instance of an observable Resource; that is the Resource that is exposed by the Server has an “rt” of “[“oic.r.<resource>”,”oic.r.value.conditional”]”.

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5.6.1.1 Conditional Notification Property Summary

Table 5-7 Conditional Notification Properties summarizes the Properties provided by the Conditional Notification Resource Type. At least one Property from the table shall be present in an instance of the Resource Type.

Table 5-7 Conditional Notification Properties

Name	Type	R/W	Required	Description
threshold	number	RW	No	Amount by which the observed value changes before a notification is generated
minnotifyperiod	integer	RW	No	Minimum elapsed time in ms before a notification may be sent
maxnotifyperiod	integer	RW	No	Maximum elapsed time in ms after which a notification is sent

All Properties if exposed shall be set with initial values. All Properties may be exposed with a value of “0” (zero); this indicates that the functionality associated with the Property is not active. Any Client may update the exposed values subject to any ACL restrictions; such changes are global and apply to all notifications that are sent to all observers. A notifier may reject an update to the Property values; in such cases a diagnostic payload should be included in the rejection response indicating the valid ranges for the Properties.

5.6.1.2 Property Definition: threshold

Minimum value change between two notifications. A notification shall be sent (within the constraints of “minnotifyperiod”) when the change since the last notification is greater than or equal to this value. The measurement is done against the value in the last notification that was sent; thus all notifications (within any “maxnotifyperiod” constraints that may be present) will carry values that differ by at least “threshold”. A “threshold” value of “0” means that no “threshold” is applied.

5.6.1.3 Property Definition: minnotifyperiod

Minimum time (in ms) that shall occur between notifications. If a value change condition is met (“threshold” equalled or exceeded or any change in value if threshold is not present) before expiration the notification shall not be sent till the period expires. If the Property is present and set to ”0”’ then no minimum notify period timer is run; if the Property is present and with a value greater than “0” then a minimum notify period timer shall be run equal to the value. The Property value itself is initially populated by the notifier. If the Property is not present the minimum notify period is up to the notifier. The timer shall be reset each time a notification is sent.

5.6.1.4 Property Definition: maxnotifyperiod

Maximum time (in ms) that the notifier shall not exceed between notifications. When the timer expires a notification shall be sent. If present and set to “0” then no maximum notify period timer is run; if present and with a value greater than 0 then a maximum notify period timer shall be run equal to the value. The Property value itself shall be initially populated by the notifier. When both “minnotifyperiod” and “maxnotifyperiod” are present and both are non-zero the value of “maxnotifyperiod” shall be larger than the “minnotifyperiod”. If not present the value shall be set by the notifier. The timer shall be reset each time a notification is sent.

5.6.1.5 Governing State Machine

The “minnotifyperiod” and “maxnotifyperiod” timers are restarted each time a notification is sent (response to the Observe). A notification is sent when value change condition (threshold) and “minnotifyperiod” are both met if both are present. If the observed Property value subsequently drops beneath threshold before the expiration of “minnotifyperiod” the notifier may take no action

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or a notification may be sent on expiration of “minnotofyperiod” containing the current observed Property value (at the time of the notification). If there are no timer constraints; then notifications are sent whenever the observed Property value has changed by an amount greater than or equal to “threshold”.

Overall logic is defined in Figure 1: Overall conditional notification logic. Figure 2: Conditional Notification Example Flow provides an illustrative sequence.

```
If minnotifyperiod expired:
  If observed value changed:
    If change amount >= threshold:
      Send notification with current value
      Reset minnotifyperiod , maxnotifyperiod
If maxnotifyperiod expired:
  Get current value
  Send notification with current value
  Reset minnotifyperiod , maxnotifyperiod
```

Figure 1: Overall conditional notification logic

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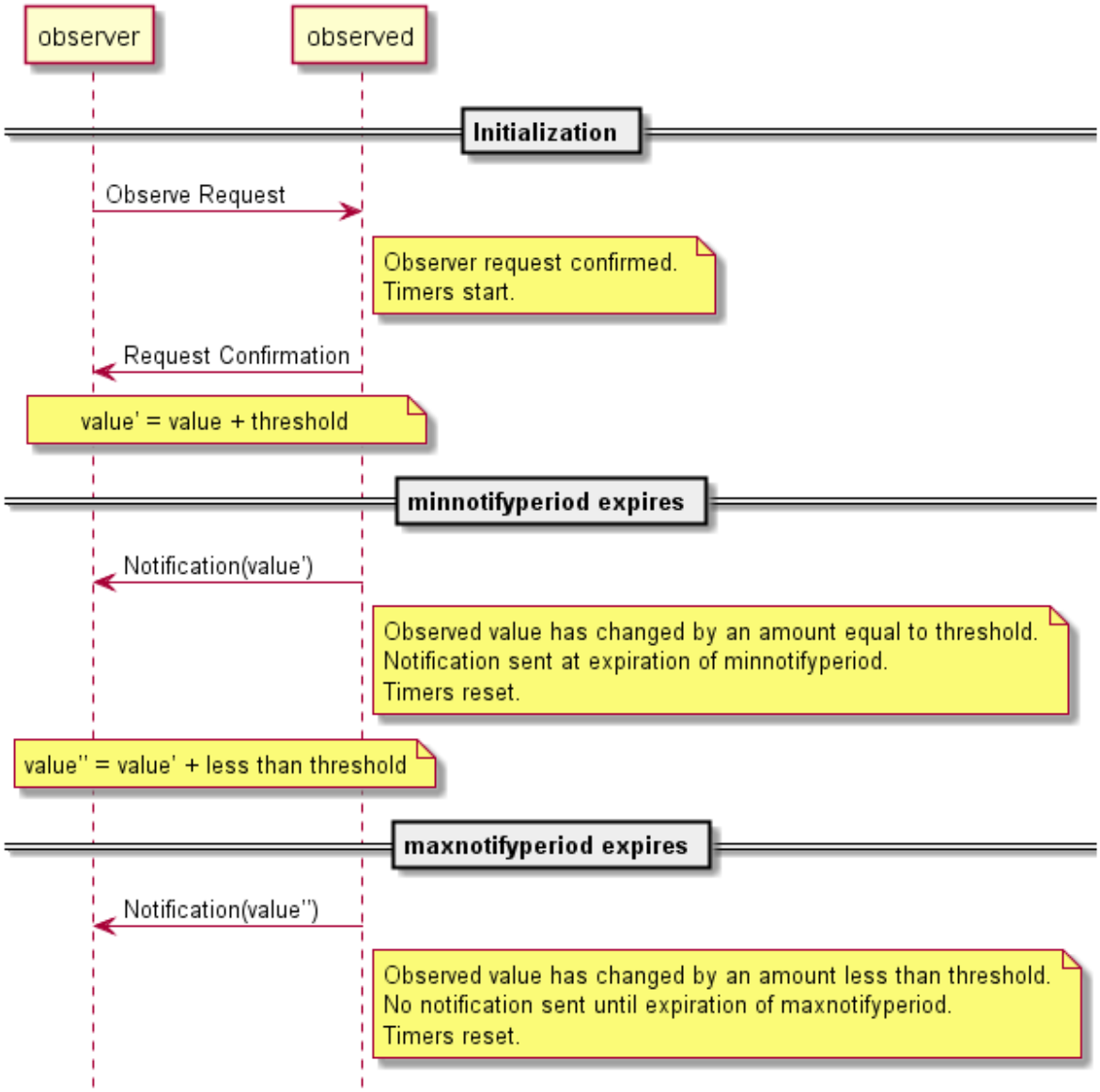

Figure 2: Conditional Notification Example Flow

5.7 Composite Resource Types

Composite Resource Types are Resources that comprises of one or more single or other composite Resource Types, an example of which is shown in Table 5-8 RAML example of Composite Resource Type. The Composite Resource Type can be viewed upon as a new single Resource Type. The Composite Resource Type mechanism is a powerful concept since it uses existing Resource Types in a new combination to express more contexts to a Resource without specifying new single unit Resource Types.

Composite Resource Types are defined by linking the referenced existing Resource values in to a Collection.

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The linking is done by using an array of Links; refer to the OCF Core Specification section 7.7.2 for more details. Note that the example listed below contains a partial schema of this definition as it is for descriptive purpose only. The Property name of the array is “links”. The relationship type shall be “contains”, denoting that the composite contains other Resource Types that make up the Composite Resource Type.

The access to the listed Resources can be achieved in a single operation by using the OCF Core Specification defined oic.if.ll interface.

Table 5-8 RAML example of Composite Resource

```
#%RAML 0.8
title: OCFExampleCompositeResource
version: v1.0


/CompositeExample:
  description: |
    CompositeExample description.
    If the CompositeExample is implemented as per the example RAML the following values apply:
    The name of the Resource is “CompositeExample Name”
    The Resource Type is “oic.r.compositeexample”
    The Interface (if) can denote Sensor or Actuator
    The value of the ActuatorExample is modeled as 2 references to other implemented Resources
    In the example oic.r.SensorExample and oic.r.ActuatorExample are used.
  get:
    description: |
      retrieves the composite example Resource.
    responses:
      200:
        body:
          application/json:
            schema: |
              {
                "id": "http://openinterconnect.org/schemas/oic.r.baseResource#",
                "$schema": "http://json-schema.org/schema#",
                "title": "SensorExample",
                "definitions": {
                  "oic.r.compositeexample": {
                    "type": "object",
                    "properties": {
                       "links": {
                          "type": "array",
                          "items": {
                             "$ref": "oic.oic-link-schema.json#"                        }
                        }
                      }
                    }
                },
                "type": "object",
                "allOf": [
                  {"$ref": "oic.core.json#/definitions/oic.core"},
                  {"$ref": "oic.baseResource.json#/definitions/oic.r.baseresource"},
                  {"$ref": "#/definitions/oic.r.compositeexample"}
                ],
                "required": ["n","id","links"]
              }
            example: |
```


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```
{
  "n":     "CompositeExample Name",
  "id":    "composite_example_id",
  "links": [
      {
        "href": "/my_1st_reference",
        "rel":  "contains",
        "rt":   ["oic.r.actuatorexample"],
        "if":   ["oic.if.a"]
      },
      {
        "href": "/my_2nd_reference",
        "rel":  "contains",
        "rt":   ["oic.r.sensorexample"],
        "if":   ["oic.if.s"]
      }
    ]
}
```

5.8 Specification Version

Devices conformant to this specification version shall add the string “ocf.res.1.0.0” to the dmv Property in oic.wk.d.

6 Resource Type definitions

6.1 Introduction

This section contains definitions for all Resource Types; the complete set is listed in Table 6-1 Alphabetical list of Resource Types. Annex A.1 provides the basic underlying schema definition against which all other Resource Types are constructed. Annex A.1 also provides an example of the use of the “oic.if.baseline” interface that all Resource Types shall support. All other sections provide example representations of the Resource Type following the application of the default interface that is applied for that specific Resource Type.

Annex B provides definitions for all Resource Types making use of Swagger2.0 instead of RAML.

All Resource Types shall be created in accordance with the OCF Core Specification Section 7.2. All comparisons against a Resource Type shall be case insensitive.

All Resource Types in this document are prefixed with “oic.r” denoting that it is an OCF defined Resource Type.

All of the sub-clauses in clause 6, Annex A, and Annex B describe the Resource Types with a restful API definition language. The Resource Type definitions presented in clause 6, Annex A, and Annex B are formatted for readability, and so may appear to have extra line breaks. The contents of the Resource Types without the extra line breaks are available in OCF Resource Type Definitions.

Table 6-1 Alphabetical list of Resource Types

Friendly Name (informative)	Resource Type (rt)	Section
Acceleration Sensor	oic.r.sensor.acceleration	6.56

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Activity Count	oic.r.sensor.activity.count	6.24
Air Quality	oic.r.airquality	6.66
Air Quality Collection	oic.r.airqualitycollection	6.67
Altimeter	oic.r.altimeter	6.61
Atmospheric Pressure	oic.r.sensor.atmosphericpressure	6.25
Air Flow	oic.r.airflow	6.2
Air Flow Control	oic.r.airflowcontrol	6.3
Audio Controls	oic.r.audio	6.26
Auto Focus	oic.r.autofocus	6.27
Automatic Document Feeder	oic.r.automaticdocumentfeeder	6.28
Auto White Balance	oic.r.colour.autowhitebalance	6.32
Basic Resource Schema	Not Applicable	Annex A.1
Battery	oic.r.energy.battery	6.4
Binary switch	oic.r.switch.binary	6.5
Brightness	oic.r.light.brightness	6.6
Button Switch	oic.r.button	6.29
Carbon Dioxide Sensor	oic.r.sensor.carbondioxide	6.30
Carbon Monoxide Sensor	oic.r.sensor.carbonmonoxide	6.31
Clock	oic.r.clock	6.62
Colour Chroma	oic.r.colour.chroma	6.7
Colour RGB	oic.r.colour.rgb	6.8
Colour Saturation	oic.r.colour.saturation	6.33
Consumable	oic.r.consumable	6.68

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Consumable Collection	oic.r.consumablecollection	6.69
Contact Sensor	oic.r.sensor.contact	6.34
Delay Defrost	oic.r.delaydefrost	6.70
Demand Response Load Control (DRLC)	oic.r.energy.drlc	6.35
Dimming	oic.r.light.dimming	6.9
Door	oic.r.door	6.10
Ecomode	oic.r.ecomode	6.71
Energy Consumption	oic.r.energy.consumption	6.11
Energy Overload/Circuit Breaker	oic.r.energy.overload	6.36
Energy Usage	oic.r.energy.usage	6.12
Generic Sensor	oic.r.sensor	6.37
Geolocation Sensor	oic.r.sensor.geolocation	6.63
Glass Break Sensor	oic.r.sensor.glassbreak	6.38
Heart Rate Zone Sensor	oic.r.sensor.heart.zone	6.39
Heating Zone	oic.r.heatingzone	6.72
Heating Zone Collection	oic.r.heatingzonecollection	6.73
Height	oic.r.height	6.64
Humidity	oic.r.humidity	6.13
Icemaker	oic.r.icemaker	6.14
Illuminance Sensor	oic.r.sensor.illuminance	6.40
Lock	oic.r.lock.status	6.15
Lock Code	oic.r.lock.code	6.16
Magnetic Field Direction	oic.r.sensor.magneticfielddirection	6.41

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