
**Information technology — Open
Connectivity Foundation (OCF)
Specification —**

**Part 5:
Smart home device specification**

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*Technologies de l'information — Spécification de la Fondation pour la
connectivité ouverte (Fondation OCF) —
Partie 5: Spécification des appareils pour applications domotiques*

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted (see www.iso.org/directives).

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This document was prepared by the Open Connectivity Foundation (OCF) (as the OCF Smart Home Device 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*.

A list of all parts in the ISO/IEC 30118 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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1 Scope

The OCF Smart Home Device specification is an Application Profile specification.

The Smart Home Device specification specifies the Smart Home devices. The Smart Home Device definitions use Resource definitions from the OCF Resource Type Specification.

The Smart Home Device Specification is built on top of the Core Specification. The Core Specification specifies the core architecture, interfaces protocols and services to enable the implementation of profiles for IoT usages and ecosystems. The Core specification also defines the main architectural components of network connectivity, discovery, data transmission, device & service management and ID & security. The core architecture is scalable to support simple devices (constrained devices) and more capable devices (smart devices).

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.

OCF Resource Type Specification, *Open Connectivity Foundation Resource Type Specification*, Version 1.0.

OCF Security Specification, *Open Connectivity Foundation Security Capabilities*, Version 1.0

IETF RFC 7049, *Concise Binary Object Representation (CBOR)*, October 2013
<http://www.ietf.org/rfc/rfc7049.txt>

IETF RFC 7159, *The JavaScript Object Notation (JSON) Data Interchange Format*, March 2014
<http://www.ietf.org/rfc/rfc7159.txt>

RAML, *Restful API modelling language*, Version 0.8.
<https://github.com/raml-org/raml-spec/blob/master/versions/raml-08/raml-08.md>

IETF RFC 4566, *SDP: Session Description Protocol*, July 2006
<https://tools.ietf.org/html/rfc4566>

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

Smart Home Bridge Device

A Smart Home Device that is capable of representing other devices that exist on the network.

3.1.3

Smart Home Device

A Device that is conformant to the normative requirements contained in this specification.

3.1.4

Sensor

Resource without support of the UPDATE operation.

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

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

3.2.3

OCF

Open Connectivity Foundation

The organization that created these specifications.

3.2.4

RAML

RESTful API Modelling Language

RAML is a simple and succinct way of describing practically-RESTful APIs. See RAML.

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

SDP

Session Description Protocol

SDP describes multimedia sessions for the purposes of session announcement, session invitation, and other forms of multimedia session initiation. It is fully defined in <https://github.com/raml-org/raml-spec/blob/master/versions/raml-08/raml-08.md>

IETF RFC 4566.

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., Network Architecture). Any lowercase uses of these words have the normal technical English meaning.

4 Document conventions and organization

This document lists all the Devices used in the smart home domain. The devices are specified by which mandatory and optional Resources are used.

For the purposes of this document, the terms and definitions given in OCF Core Specification and OCF Resource Type 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 a Smart Home Device. The phrases “shall not”, and “PROHIBITED” indicate behavior that is prohibited, i.e. that if performed means the implementation is not in compliance.

Recommended (or should).

These features add functionality supported by a Smart Home Device and should be implemented. Recommended features take advantage of the capabilities a Smart Home Device, 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 behavior that is permitted but not recommended.

Allowed (or allowed).

These features are neither required nor recommended by a Smart Home Device, 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 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.

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

Words that are emphasized are printed in *italic*.

4.2 Data types

See OCF Core Specification.

4.3 Document structure

The Smart Home Device specification defines a Device for usage in the Smart Home vertical. This document describes a Device and makes use of functionality defined in the OCF Core Specification and OCF Resource Type Specification.

The OCF Core Specification provides building blocks to define Devices. The following functionality is used:

- Required Core Resources.
- Required transports.

Note that other mandatory functions in the OCF Core Specification might be needed to create an OCF compliant device, but are not mentioned in this document.

The Smart Home Device profile consists of using RAML as a specification language and using JSON Schemas as payload definitions for all CRUDN actions. The mapping of the CRUDN actions is specified in the CORE.

Other building blocks used in this document are the Resource Types specified in the OCF Resource Type Specification.

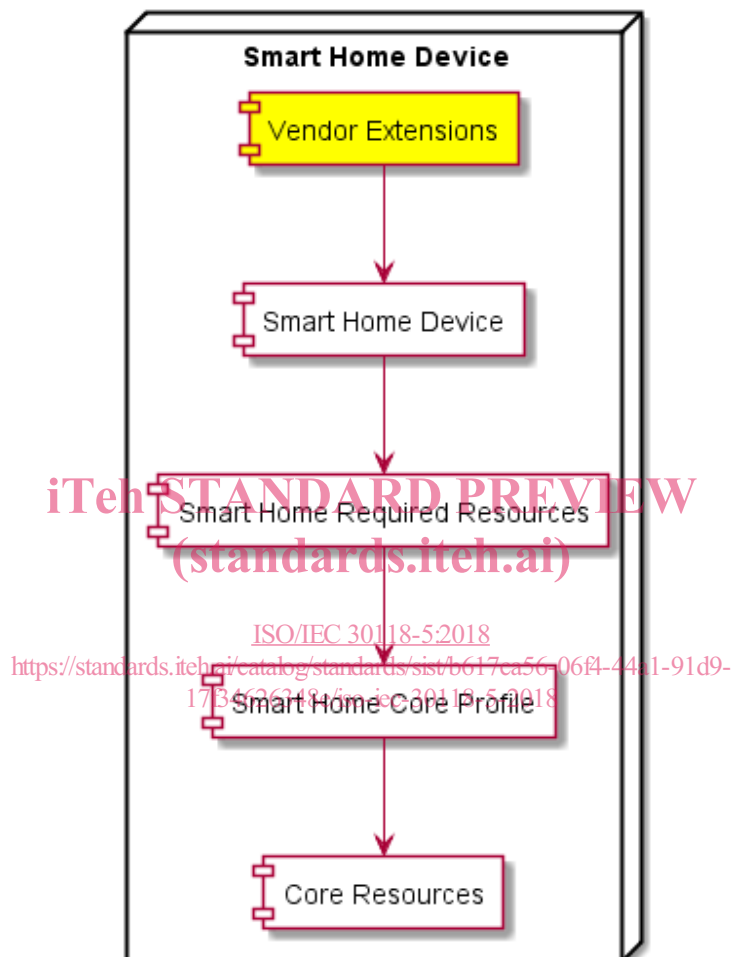


Figure 1 Smart Home device building blocks.

This document describes which constructs are used for a Smart Home Device and which Resources are mandated to be implemented for each Smart Home Device. A typical Smart Home Device consisting of data elements defined in the referenced specification documents is depicted in Figure 1.

5 Operational Scenarios

5.1 Specification Version

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

6 Core Resource model

6.1 Introduction

The Core Resource model is described in the OCF Core Specification.

6.2 Device Type

The device types of all Smart Home devices shall have a Resource Type name (“rt”) prefixed with “oic.d.”

Examples of Device Types are:

- oic.d.fan
- oic.d.thermostat

The full list of Smart Home defined Device names and types are in Table 9-1. This table also includes the list of minimal Resource(s) that a Device shall implement for that device type. A device may expose additional OCF and vendor defined Resources than indicated in this Table.

The OCF Core Specification defines a Device Resource with a URI of “/oic/d”. A Smart Home Device shall include in the Resource Type ID of “/oic/d” the device type from Table 9-1 of the physical device hosting the Server; the inclusion of the device type shall be done using one of the methods provided by Section 11.3.4 of the OCF Core Specification (i.e. add to the array of values). An instance of “/oic/d” with its Resource Type name modified in this manner shall expose all mandatory Properties for “/oic/d” defined in the OCF Core Specification.

Therefore a Smart Home Device may be discovered by adding a query for the “rt” of the Device Type itself (e.g. oic.d.fan) to the OCF Core Specification defined multicast endpoint discovery method (see also Section 7.1).

A Smart Home Device may additionally define a Resource with a vendor defined URI that is discoverable within “/oic/res” with a Resource Type ID from Table 9-1. In this instance the Resource shall have the Resource Properties and be subject to the same semantics as oic.wk.d as defined in the OCF Core Specification. In the case where the Resource tagged in this manner additionally follows the Collection semantics defined in the OCF Core Specification then the Resources that are part of that Collection shall at a minimum include the Resources defined for the Resource Type ID in Table 9-1.

6.3 Profile of OCF Core Specification

This section describes the profiling of the Core Resources and transport mechanisms and functions that are defined in the OCF Core Specification.

The required OCF Core Specification Resources are also required for a Smart Home profile implementation.

In addition to the required Resources the optional OCF Core Specification Resources in Table 6-1 shall be required for a Smart Home Profile.

Table 6-1 Required Resources for Smart Home Devices

Resource (“rt”)	Required in Profile
Intentionally left blank	Intentionally left blank