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

**Part 6:
Resource to AllJoyn interface mapping
specification**

*Technologies de l'information — Specification de la Fondation pour la
connectivité ouverte (Fondation OCF) —*

*Partie 6: Spécification du mapping entre les ressources et l'interface
AllJoyn*





COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2021

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	vi
Introduction	vii
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Document conventions and organization	2
4.1 Conventions	2
4.2 Notation	3
5 Theory of operation	3
5.1 Interworking approach	3
5.2 Mapping syntax	4
5.2.1 Introduction	4
5.2.2 General	4
5.2.3 Value assignment	4
5.2.4 Property naming	4
5.2.5 Arrays	4
5.2.6 Default mapping	4
5.2.7 Conditional mapping	4
5.2.8 Loops	5
5.2.9 Method invocation	5
6 AllJoyn translation	5
6.1 Operational scenarios	5
6.2 Requirements specific to an AllJoyn bridging function	5
6.2.1 Introduction	5
6.2.2 Use of introspection	5
6.2.3 Stability and loss of data	6
6.2.4 Exposing AllJoyn producer devices to OCF clients	6
6.2.5 Exposing OCF resources to AllJoyn consumer applications	14
6.2.6 Security	21
6.3 On-the-fly translation from d-bus and OCF payloads	21
6.3.1 Introduction	21
6.3.2 Translation without aid of introspection	21
6.3.3 Translation with aid of introspection	27
7 Device type mapping	32
7.1 AllJoyn device types to OCF device types	32
7.2 OCF device types with no AllJoyn equivalent	32
8 Resource to interface equivalence	33
8.1 Introduction	33
8.2 Environment.CurrentAirQuality mapping	34
8.3 Environment.CurrentAirQualityLevel mapping	35
8.4 Operation.ClimateControlMode mapping	35
8.5 Operation.FanSpeedLevel mapping	35
8.6 Operation.HeatingZone mapping	35

8.7	Operation.OnOffStatus, Operation.OnControl, and Operation.OffControl mapping	35
8.8	Operation.OvenCyclePhase	35
9	Detailed mapping APIs	35
9.1	Introduction	35
9.2	Current air quality	36
9.2.1	Derived model	36
9.2.2	Property definition	36
9.2.3	Derived model definition	37
9.3	Current air quality level	38
9.3.1	Derived model	38
9.3.2	Property definition	38
9.3.3	Derived model definition	39
9.4	Current humidity	40
9.4.1	Derived model	40
9.4.2	Property definition	40
9.4.3	Derived model definition	41
9.5	Current temperature	41
9.5.1	Derived model	41
9.5.2	Property definition	41
9.5.3	Derived model definition	42
9.6	Target humidity	43
9.6.1	Derived model	43
9.6.2	Property definition	43
9.6.3	Derived model definition	44
9.7	Target temperature	45
9.7.1	Derived model	45
9.7.2	Property definition	45
9.7.3	Derived model definition	46
9.8	Audio volume	47
9.8.1	Derived model	47
9.8.2	Property definition	47
9.8.3	Derived model definition	48
9.9	Climate control mode	49
9.9.1	Derived model	49
9.9.2	Property definition	49
9.9.3	Derived model definition	49
9.10	Closed status	50
9.10.1	Derived model	50
9.10.2	Property definition	50
9.10.3	Derived model definition	51
9.11	Cycle control	51
9.11.1	Derived model	51
9.11.2	Property definition	51
9.11.3	Derived model definition	52
9.12	Fan speed level	53
9.12.1	Derived model	53
9.12.2	Property definition	53

9.12.3	Derived model definition	54
9.13	Heating zone.....	55
9.13.1	Derived model	55
9.13.2	Property definition	55
9.13.3	Derived model definition.....	55
9.14	HVAC fan mode	56
9.14.1	Derived model	56
9.14.2	Property definition	56
9.14.3	Derived model definition.....	57
9.15	On/Off control.....	58
9.15.1	Derived model	58
9.15.2	Property definition	58
9.15.3	Derived model definition.....	59
9.16	On off mapping.....	59
9.16.1	Derived model	59
9.16.2	Property definition	59
9.16.3	Derived model definition.....	60
9.17	Oven cycle phase	60
9.17.1	Derived model	60
9.17.2	Property definition	60
9.17.3	Derived model definition.....	61
10	Resource type definitions	62
10.1	List of resource types	62
10.2	AllJoynObject.....	62
10.2.1	Introduction.....	62
10.2.2	Example URI.....	62
10.2.3	Resource type	62
10.2.4	OpenAPI 2.0 definition	62
10.2.5	Property definition	66
10.2.6	CRUDN behaviour	67
10.3	SecureMode.....	67
10.3.1	Introduction.....	67
10.3.2	Example URI.....	67
10.3.3	Resource type	67
10.3.4	OpenAPI 2.0 definition	67
10.3.5	Property definition	69
10.3.6	CRUDN behaviour	69

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

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 or www.iec.ch/members_experts/refdocs).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents) or the IEC list of patent declarations received (see patents.iec.ch).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html. In the IEC, see www.iec.ch/understanding-standards.

This document was prepared by the Open Connectivity Foundation (OCF) (as OCF Resource to AllJoyn Interface Mapping Specification, version 2.2.0) 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*.

This second edition cancels and replaces the first edition (ISO/IEC 30118-6:2018), which has been technically revised.

The main changes compared to the previous edition are as follows:

- AllJoyn text moved from the bridging specification to this document;
- addition of clarifications throughout.

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

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 and www.iec.ch/national-committees.

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.

ISO/IEC 30118 consists of eighteen parts, under the general title Information technology — Open Connectivity Foundation (OCF) Specification. The parts fall into logical groupings as described herein:

- Core framework
 - Part 1: Core Specification
 - Part 2: Security Specification
 - Part 13: Onboarding Tool Specification
- Bridging framework and bridges
 - Part 3: Bridging Specification
 - Part 6: Resource to Alljoyn Interface Mapping Specification
 - Part 8: OCF Resource to oneM2M Resource Mapping Specification
 - Part 14: OCF Resource to BLE Mapping Specification
 - Part 15: OCF Resource to EnOcean Mapping Specification
 - Part 16: OCF Resource to UPlus Mapping Specification
 - Part 17: OCF Resource to Zigbee Cluster Mapping Specification
 - Part 18: OCF Resource to Z-Wave Mapping Specification
- Resource and Device models
 - Part 4: Resource Type Specification
 - Part 5: Device Specification

ISO/IEC 30118-6:2021(E)

- Core framework extensions
 - Part 7: Wi-Fi Easy Setup Specification
 - Part 9: Core Optional Specification
- OCF Cloud
 - Part 10: Cloud API for Cloud Services Specification
 - Part 11: Device to Cloud Services Specification
 - Part 12: Cloud Security Specification

Information technology — Open Connectivity Foundation (OCF) —

Part 6: Resource to AllJoyn interface mapping specification

1 Scope

This document provides detailed mapping information to provide equivalency between AllJoyn defined Interfaces and OCF defined Resources.

This document provides mapping for Device Types (AllJoyn to/from OCF), identifies equivalent OCF Resources for both mandatory and optional AllJoyn interfaces and for each interface defines the detailed Property by Property mapping using OCF defined extensions to JSON schema to programmatically define the mappings.

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.

ISO/IEC 30118-1 *Information technology -- Open Connectivity Foundation (OCF) Specification -- Part 1: Core specification*

<https://www.iso.org/standard/53238.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/74239.html>

Latest version available at: https://openconnectivity.org/specs/OCF_Security_Specification.pdf

ISO/IEC 30118-4 *Information technology -- Open Connectivity Foundation (OCF) Specification -- Part 4: Resource type specification*

<https://www.iso.org/standard/74241.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: Smart home device specification*

<https://www.iso.org/standard/74242.html>

Latest version available at: https://openconnectivity.org/specs/OCF_Device_Specification.pdf

JSON Hyper-Schema, *JSON Hyper-Schema: A Vocabulary for Hypermedia Annotation of JSON*, October 2016

<http://json-schema.org/latest/json-schema-hypermedia.html>

ISO/IEC 30118-6:2021(E)

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>

IETF RF 4648, *The Base16, Base32 and Base64 Data Encodings*, October 2006
<https://www.rfc-editor.org/info/rfc4648>

IETF RFC 6973, *Privacy Considerations for Internet Protocols*, July 2013
<https://www.rfc-editor.org/info/rfc6973>

IETF RFC 7159, *The JavaScript Object Notation (JSON) Data Interchange Format*, March 2014
<https://www.rfc-editor.org/info/rfc7159>

AllJoyn Common Data Model Interface Definitions
<https://wiki.alljoyn.org/cdm>

AllJoyn About Interface Specification, *About Feature Interface Definitions*, Version 14.12
<https://allseenalliance.org/framework/documentation/learn/core/about-announcement/interface>

AllJoyn Configuration Interface Specification, *Configuration Interface Definition*, Version 14.12
<https://allseenalliance.org/framework/documentation/learn/core/configuration/interface>

D-Bus Specification, *D-Bus Specification*
<https://dbus.freedesktop.org/doc/dbus-specification.html>