INTERNATIONAL STANDARD

ISO/IEC 30118-6

Second edition
2021-10

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

Reference number
ISO/IEC 30118-6:2021(E)

© ISO/IEC 2021



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

© ISO/IEC 2021 – All rights reserved

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

 © ISO/IEC 2021 – All rights reserved

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

© ISO/IEC 2021 – All rights reserved

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.

© ISO/IEC 2021 – All rights reserved

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 2021 – All rights reserved

- 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

© ISO/IEC 2021 – All rights reserved

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 2021 – All rights reserved

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 30118-1 and the following apply.

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

– ISO Online browsing platform: available at https://www.iso.org/obp

– IEC Electropedia: available at http://www.electropedia.org/

4 Document conventions and organization

4.1 Conventions

In this document 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.

In this document, to be consistent with the IETF usages for RESTful operations, the RESTful operation words CRUDN, CREATE, RETRIVE, UPDATE, DELETE, and NOTIFY will have all letters capitalized. Any lowercase uses of these words have the normal technical English meaning.

 © ISO/IEC 2021 – All rights reserved