INTERNATIONAL STANDARD

ISO/IEC 30118-3

Second edition
2021-10

Information technology — Open Connectivity Foundation (OCF) Specification —

Part 3: Bridging specification

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

Partie 3: Spécification de pontage



Reference number
ISO/IEC 30118-3:2021(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

© ISO/IEC 2021 – All rights reserved

Contents

Page

Foreword ... iv
Introduction ... v
1 Scope ... 1
2 Normative references ... 1
3 Terms, definitions, and abbreviated terms ... 1
3.1 Terms and definitions ... 1
3.2 Symbols and abbreviated terms ... 4
4 Document conventions and organization ... 4
4.1 Conventions ... 4
4.2 Notation ... 4
5 Introduction ... 5
5.1 Translation between OCF and non-OCF ecosystem - primitive concept of Bridging ... 5
5.2 Bridge platform ... 5
5.3 Symmetric vs. asymmetric bridging ... 7
5.4 General requirements ... 8
5.4.1 Requirements common to all bridge platforms ... 8
5.4.2 Requirements specific to symmetric bridge platforms ... 8
5.5 VOD list ... 9
5.6 Resource discovery ... 9
5.7 "Deep translation" vs. "on-the-fly" ... 14
5.8 Security ... 14
6 Device type definitions ... 14
7 Resource type definitions ... 14
7.1 List of resource types ... 14
7.2 VOD list ... 15
7.2.1 Introduction ... 15
7.2.2 Example URI ... 15
7.2.3 Resource type ... 15
7.2.4 OpenAPI 2.0 definition ... 15
7.2.5 Property definition ... 17
7.2.6 CRUDN behaviour ... 17

© 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 Bridging Framework 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 30118-3:2018), which has been technically revised.

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

— bridging specification has been made more generic;

— text moved from AllJoyn mapping to the resource to Resource to AllJoyn interface mapping specification;

— 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) Specification —

Part 3: Bridging specification

1 Scope

This document specifies a framework for translation between OCF Devices and other ecosystems, and specifies the behaviour of a Bridging Function that exposes servers in non-OCF ecosystem to OCF Clients and/or exposes OCF Servers to clients in non-OCF ecosystem. Translation per specific Device is left to other documents (deep translation). This document provides generic requirements that apply unless overridden by a more specific document.

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

ISO/IEC 30118-2 *Information technology -- Open Connectivity Foundation (OCF) Specification -- Part 2: Security specification*
https://www.iso.org/standard/74239.html

JSON Schema Core, *JSON Schema: core definitions and terminology*, January 2013
http://json-schema.org/latest/json-schema-core.html

OpenAPI Specification, Version 2.0
https://github.com/OAI/OpenAPI-Specification/blob/master/versions/2.0.md

3 Terms, definitions, and abbreviated terms

3.1 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/

© ISO/IEC 2021 – All rights reserved

3.1.1
Asymmetric Client Bridge
Bridge (3.1.3) that exposes another ecosystem's clients into the OCF ecosystem as *Virtual OCF Clients* (3.1.21). This is equivalent to exposing *OCF Servers* (3.1.18) into the other ecosystem.

3.1.2
Asymmetric Server Bridge
Bridge that exposes another ecosystem devices into the OCF ecosystem as *Virtual OCF Servers* (3.1.18). How this is handled in each ecosystem is specified on a per ecosystem basis in this document.

3.1.3
Bridge
OCF Device that has a Device Type of "oic.d.bridge", provides information on the set of *Virtual OCF Devices* (3.1.22) that are resident on the same Bridge Platform.

3.1.4
Bridge Platform
entity on which the *Bridge* (3.1.3) and *Virtual OCF Devices* (3.1.22) are resident

3.1.5
Bridged Client
logical entity that accesses data via a *Bridged Protocol* (3.1.7)

3.1.6
Bridged Device
Bridged Client (3.1.5) or *Bridged Server* (3.1.10).

3.1.7
Bridged Protocol
another protocol that is being translated to or from OCF protocols

3.1.8
Bridged Resource
artefact modelled and exposed by a *Bridged Protocol* (3.1.7)

3.1.9
Bridged Resource Type
schema used with a *Bridged Protocol* (3.1.7)

3.1.10
Bridged Server
logical entity that provides data via a *Bridged Protocol* (3.1.7). More than one Bridged Server can exist on the same physical platform.

3.1.11
Bridging Function
logic resident on the *Bridge Platform* (3.1.4) that performs that protocol mapping between OCF and the *Bridged Protocol* (3.1.7); a *Bridge Platform* (3.1.4) may contain multiple Bridging Functions dependent on the number of *Bridged Protocols* (3.1.7) supported.

3.1.12
OCF Bridge Device
OCF Device (3.1.14) that can represent devices that exist on the network but communicate using a *Bridged Protocol* (3.1.7) rather than OCF protocols.

 © ISO/IEC 2021 – All rights reserved

3.1.13
OCF Client
logical entity that accesses an *OCF Resource* (3.1.15) on an *OCF Server* (3.1.18), which might be a *Virtual OCF Server* (3.1.24) exposed by the *OCF Bridge Device* (3.1.12)

3.1.14
OCF Device
logical entity that assumes one or more OCF. More than one OCF Device can exist on the same physical platform

3.1.15
OCF Resource
represents an artefact modelled and exposed by the OCF Framework

3.1.16
OCF Resource Property
significant aspect or notion including metadata that is exposed through the *OCF Resource* (3.1.15)

3.1.17
OCF Resource Type
OCF Resource Property (3.1.16) that represents the data type definition for the *OCF Resource* (3.1.15)

3.1.18
OCF Server
logical entity with the role of providing resource state information and allowing remote control of its resources

3.1.19
Virtual Bridged Client
logical representation of an *OCF Client* (3.1.13), which an *OCF Bridge Device* (3.1.12) exposes to *Bridged Servers* (3.1.10).

3.1.20
Virtual Bridged Server
logical representation of an *OCF Server* (3.1.18), which an *OCF Bridge Device* (3.1.12) exposes to *Bridged Clients* (3.1.5).

3.1.21
Virtual OCF Client
logical representation of a *Bridged Client* (3.1.5), which an *OCF Bridge Device* (3.1.12) exposes to *OCF Servers* (3.1.18)

3.1.22
Virtual OCF Device
Virtual OCF Client (3.1.21) or *Virtual OCF Server* (3.1.24).

3.1.23
Virtual OCF Resource
logical representation of a *Bridged Resource* (3.1.8), which an *OCF Bridge Device* (3.1.12) exposes to *OCF Clients* (3.1.13)

3.1.24
Virtual OCF Server
logical representation of a *Bridged Server* (3.1.10), which an *OCF Bridge Device* (3.1.12) exposes to *OCF Clients* (3.1.13).

© ISO/IEC 2021 – All rights reserved