INTERNATIONAL STANDARD

ISO/IEC 30118-11

First edition
2021-10

Information technology — Open Connectivity Foundation (OCF) Specification —

Part 11: Device to cloud services specification

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

Partie 11: Spécification des services entre appareil et nuage



Reference number
ISO/IEC 30118-11:2021(E)

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Published in Switzerland

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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).

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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 Device to Cloud Services 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*.

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.

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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

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- 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

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Information technology — Open Connectivity Foundation (OCF) Specification —

Part 11:
Device to cloud services specification

1 Scope

This document defines functional extensions to the capabilities defined in ISO/IEC 30118-1 to meet the requirements of the OCF Cloud. This document specifies new Resource Types to enable the functionality and any extensions to the existing capabilities defined in ISO/IEC 30118-1.

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 17788 *Information technology – Cloud computing – Overview and vocabulary*
https://www.iso.org/standard/60544.html

ISO/IEC 17789 *Information technology – Cloud computing – Reference architecture*
https://www.iso.org/standard/60545.html

OCF Core Optional Framework, *Open Connectivity Foundation Core – Optional Specification, Version 2.2.0*
Available at: https://openconnectivity.org/specs/OCF_Core_Optional_Specification_v2.2.0.pdf
Latest version available at: https://openconnectivity.org/specs/OCF_Core_Optional_Specification.pdf

OCF Wi-Fi Easy Setup, *Open Connectivity Foundation Wi-Fi Easy Setup, Version 2.2.0*
Available at: https://openconnectivity.org/specs/OCF_Wi-Fi_Easy_Setup_Specification_v2.2.0.pdf
Latest version available at:
https://openconnectivity.org/specs/OCF_Wi-Fi_Easy_Setup_Specification.pdf

OCF Cloud Security, *Open Connectivity Foundation Cloud Security, Version 2.2.0*
Available at: https://openconnectivity.org/specs/ OCF_Cloud_Security_Specification_v2.2.0.pdf
Latest version available at:
https://openconnectivity.org/specs/OCF_Cloud_Security_Specification.pdf

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OCF Cloud API for Cloud Services, *Open Connectivity Foundation Cloud API for Cloud Services, Version 2.2.0*
Available at:
https://openconnectivity.org/specs/OCF_Cloud_API_For_Cloud_Services_Specification_v2.2.0.pdf
Latest version available at:
https://openconnectivity.org/specs/OCF_Cloud_API_For_Cloud_Services_Specification.pdf

IETF RFC 6749, *The OAuth 2.0 Authorization Framework*, October 2012
https://tools.ietf.org/html/rfc6749

IETF RFC 6750, *The OAuth 2.0 Authorization Framework: Bearer Token Usage*, October 2012
https://tools.ietf.org/html/rfc6750

IETF RFC 8323, *CoAP (Constrained Application Protocol) over TCP, TLS, and WebSockets*, February 2018
https://tools.ietf.org/html/rfc8323

OpenAPI specification, *fka Swagger RESTful API Documentation 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 ISO/IEC 30118-2 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/

3.1.1
Cloud Provider
entity or organization that hosts an *OCF Cloud* (3.1.2).

3.1.2
OCF Cloud
logical entity that is owned by the *Cloud Provider* (3.1.1) that authorised to communicate with a Device on behalf of the *OCF Cloud User* (3.1.3).

3.1.3
OCF Cloud User
Client that has permissions to interact with the Devices that are exposed by the *OCF Cloud* (3.1.2).

3.1.4
Resource Directory
set of descriptions of Resources where the actual Resources are held on Servers external to the entity hosting the *Resource Directory* (3.1.4), allowing lookups to be performed for those Resources

3.2 Symbols and abbreviated terms

UX User Experience

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