



EUOS

EU Observatory for
ICT Standardisation

Report of TWG-IIoT & EDGE: **Landscape of Internet of Things (IoT) Standards**

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StandICT.eu 2023

ICT STANDARDISATION OBSERVATORY AND SUPPORT FACILITY IN EUROPE

DOI: 10.5281/zenodo.7193436



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The StandICT.eu 2023 Coordination and Support Action project has received funding from the European Union's Horizon 2020 - Research and Innovation programme - under grant agreement no. 951972. The project is coordinated by [Trust-IT Srl](#) (IT), supported by its partners from the [Dublin City University](#) (IE) and [AUSTRALO](#) (ES). The content of the present report does not represent the opinion of the European Union, and the European Union is not responsible for any use that might be made of such content.

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■ 1 Introduction

The Internet of Things (IoT) as a concept has been initiated more than two decades ago. IoT can be considered to be a system that interconnects heterogeneous technologies supporting our daily needs impacting on a large scale our lives as well as the way we do business, locally and globally. IoT systems and IoT applications have been implemented and deployed in almost all vertical industry domains, such as Health, Industry & Manufacturing, Agriculture, Finance, Mobility, Energy, Public safety, Buildings and Cities.



Successful deployment of IoT technologies and IoT applications demands standards and protocols. The development and promotion of these standards and protocols is a cooperative undertaking between governments, academia, industry and the public interest.

This depends largely on the work and activities accomplished in SDOs (Standards Development Organizations), Alliances and OSS (Open-Source Software) initiatives. Currently, there are many SDOs, Alliances and OSS initiatives that are active and competing in the IoT technology and applications areas. In this context, the IoT landscape is considered to be complex, dynamic and challenging to grasp and visualize.

The goal of this report is to capture the landscape of IoT activities and IoT documents/specifications published and/or under publication by SDOs, Alliances and OSS Initiatives.

In order to realize this goal, this report has used the methodology and process defined by EUOS StandICT.eu in the "[Landscape of AI Standards](#)" report of TWG AI (Technical Working Group of Artificial Intelligence). In particular, representatives from several SDOs, Alliances, OSS Initiatives and academic institutions have created an open-access database of IoT related specifications and documents, such as architectures, requirements, technical reports, reviews, white papers, guidelines, etc. in a way that encourages future extensions, re-use, cross-comparisons and re-classification according to various needs. Applying the EUOS StandICT.eu aforementioned methodology and process, the TWG IoT and Edge team members who collated this report, made the collected disparate outcomes from across the global community, readable and accessible, and at the same time provided the possibility to make dynamic extensions of these collected outcomes in the future.

StandICT.eu and the team of TWG IoT and Edge thank the European Commission for supporting this work and invite experts to join us in expanding the coverage of the IoT related database behind this report, and use it to compare standards, improve them, and make their work more effective.

By the editor, **Georgios Karagiannis**

■ 2 Acknowledgements

StandICT.eu 2023 gratefully acknowledges the following individuals, who have contributed the present report: **Ray Walshe**, Director EUOS, **Georgios Karagiannis** (editor), AIOTI WG Standardisation Chair & Huawei, **Noleen Campbell**, NSAI Standards, **Maria Ines Robles**, Tampere University, **Michelle Wetterwald**, Netellany, **Orfeas Voutyras**, Institute of Communication and Computer Systems, **Antonio Kung**, Trialog, **Lindsay Frost**, NEC, **George Suciu**, BEIA Consult, **Amélié Gyrard**, Trialog, **Jens Gayko**, VDE Association for Electrical, Electronic & Information Technologies, **Axel Rennoch**, Fraunhofer FOKUS, **Edward C. Zimmermann**, NONMONOTONIC Networks, **Marco Carugi**, Consultant, **Amanda Suo**, UNE - Spanish Standardisation Body, **Carlos Valderrama**, Huawei, **Richard Pitwon**, Resolute Photonics, **Christine Perey**, Spime Wrangler, **Kong Lingbo**, Huawei, **Shen Bin**, CAICT, **Samir Medjiah**, Laas-CNRS Toulouse

Thanks to the European Commission for their continued guidance and support: **Thomas Reibe**, **Emilio Davila-Gonzales**, **Eddy Hartog** and **Max Lemke**.

3 Foreword

The Internet of Things (IoT) has advanced rapidly over the past two decades, earning itself a place as one of the main drivers of digital innovation worldwide, together with artificial intelligence (AI) and big data technologies. IoT is *reshaping our future* and investment in edge computing, as data processing and analytics move from cloud and data centres to the periphery of the network, where data is generated. This will cause a paradigm shift where data is processed, with the current 80% ratio of computing taking place centrally, and the remaining 20% in smart connected objects, expected to be reversed over the next five years.



To realise the green and digital transition, Europe needs to step up its investments in IoT and connectivity, facilitating data access, invest in energy-efficient edge nodes and increase the capacity of its data infrastructure. *IoT and edge computing* will play a significant role in the future of our businesses, economy and society, especially while keeping data at the edge and taking decisions at a local level. This gives us an advantage in global emergencies like the energy crisis, natural disasters caused by climate change, and the Covid-19 pandemic. In order to make intelligent decisions and cut the use of fossil fuels, technologies like AI and the IoT rely on access to high-quality, interoperable data. The EU's support for data spaces in key areas like agriculture, energy, manufacturing and mobility is a unique opportunity to streamline operational processes and make smart decisions. When building the grounds for a data infrastructure, European actors need to be aligned through common Design Principles for Data Spaces, and on the regulatory side, the recent proposal of the Data Act provides a harmonised legal framework to increase legal certainty for consumers and businesses, build trust in data sharing for European industries and establish a framework for efficient data interoperability and standards. Swift action on technologies and standards is needed for Europe to avoid dependencies at an early stage of the edge computing market, which is recognised as a critical area of the recent update¹ to the European Industrial Strategy report².

For European investment to deliver in a fast-paced technological scenario such as that of IoT and the edge, this needs to be accompanied by a robust standards ecosystem, capable of upholding European priorities in an international context. This will entail synergies and dialogue around the processes defined by standards developing organisations (SDOs), while defining a way for the European Commission to issue standardisation requests to said SDOs in cases where suitable standards are still needed to underpin development. The Commission together with their stakeholders have employed various strategies to respond to the need for an ever-increasing ICT standardisation speed via the instruments available to them, such as projects, studies, grants and other funding tools offering deliverables (reference architectures, ontologies, etc.) for a fast-track standardisation process at the SDOs. Moreover, this process offers the additional benefit of allowing to pilot the architectures and implementations in practical environment. The SDOs have themselves demonstrated innovative approaches for speeding up the standardisation process.

Therefore, we look forward to stimulating further thought leadership around the IoT standardisation efforts underway outlined in the report, which will be key to harmonising European efforts in this field and favouring a structured dialogue between the Commission, Member States and SDOs.

Dr. Max Lemke,

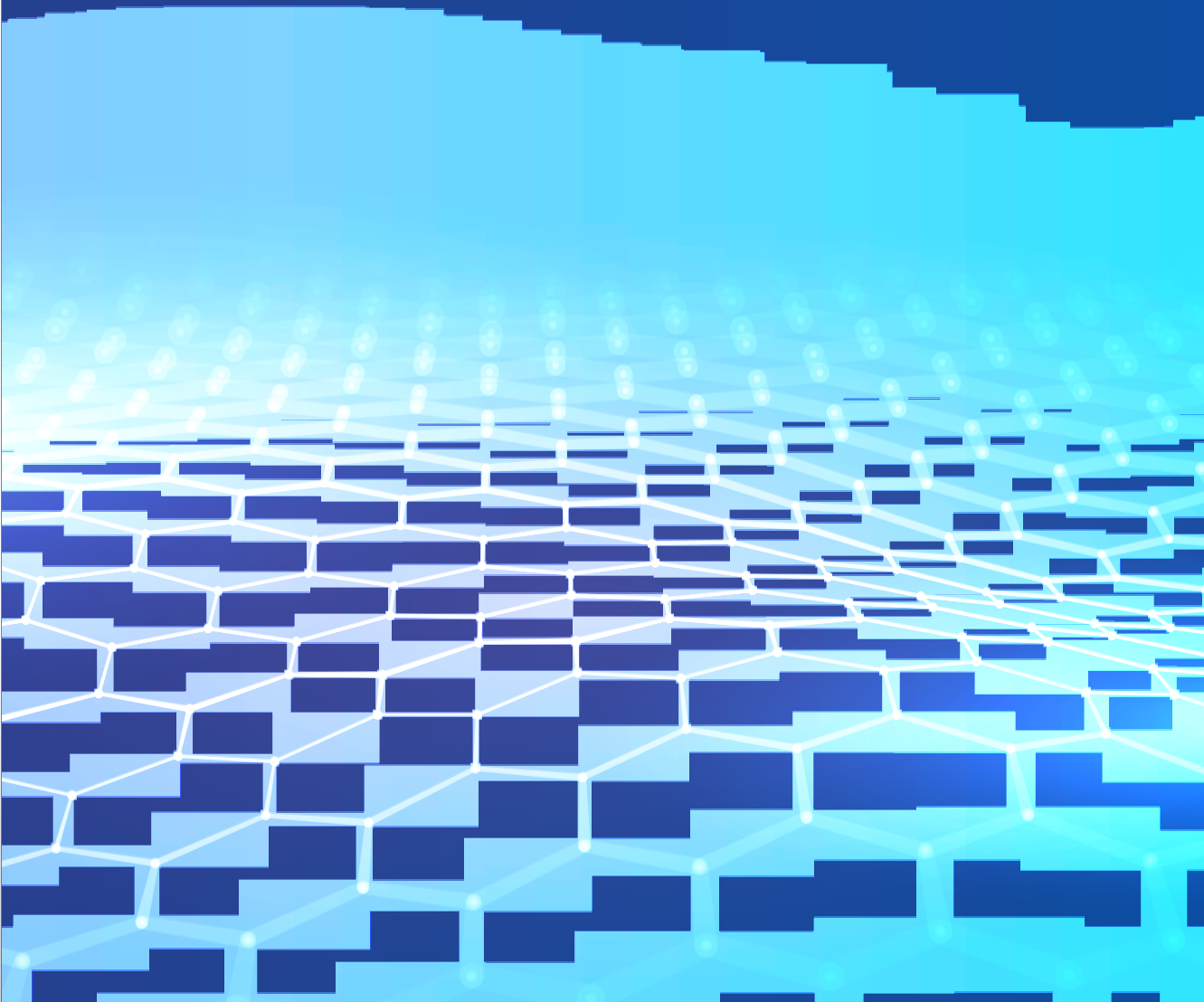
Head of Unit Internet of Things

DG Connect of the European Commission

¹ https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-industrial-strategy_en

² https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-industrial-strategy/depth-reviews-strategic-areas-europes-interests_en

4 Landscape of Standards




■ BuiltEnvironment

■ Horizontals & Verticals

ETSI TS 103 849 Smart M2M; Smart Escalators IoT System

 **URL:** https://www.etsi.org/deliver/etsi_ts/103700_103799/103735/01.01.01_60/ts_103735v010101p.pdf

ABSTRACT: The scope of this standard is the specification of the IoT system for Smart Escalators. It includes: the identification of the relevant roles; the information models in the Smart Lift system, including signals, alarms and commands; the mapping to the communication system (oneM2M); It is a twin specification of ETSI TS 103 735 “Smart Lift IoT System” and is expected to share most of the technical content with it in light of the similarities among lifts and escalators information systems. It is also expected to be linked with the ontology in ETSI TS 103 410-11 “SAREF for Lifts”.

 **DOCUMENT TYPE:** Standard_Specification


 **PUBLICATION DATE:** 2022-08

■ SmartCity

ITU-T L.1370 (11/2018) Sustainable and intelligent building services

 **URL:** <https://handle.itu.int/11.1002/1000/13724>

ABSTRACT: This recommendation sets out the services and data required for a sustainable and intelligent building to improve the quality of life of citizens, as well as the specification of its functional features and the technical requirements to be met by the device that provides these services and data.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-11

■ Case Studies and Rankings

■ Buildings

IETF RFC7733 Applicability Statement: The Use of the Routing Protocol for Low-Power and Lossy Networks (RPL) Protocol Suite in Home Automation and Building Control

 **URL:** <https://datatracker.ietf.org/doc/rfc7733/>

ABSTRACT: The purpose of this document is to provide guidance in the selection and use of protocols from the Routing Protocol for Low-Power and Lossy Networks (RPL) protocol suite to implement the features required for control in building and home environments.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-02

■ Horizontals & Verticals

IETF draft-ietf-raw-use-cases RAW use-cases

 **URL:** <https://datatracker.ietf.org/doc/draft-ietf-raw-use-cases/>

ABSTRACT: This document presents wireless use-cases (such as aeronautical communications, amusement parks, industrial applications, pro audio and video, gaming, UAV and V2V control, edge robotics and emergency vehicles) demanding reliable and available behavior.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-02

IETF RFC 8578 Deterministic Networking Use Cases

 **URL:** <https://datatracker.ietf.org/doc/rfc8578/>

ABSTRACT: This document presents use cases for diverse industries that have in common a need for “deterministic flows”.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2019-01

ISO/IEC TR 22417:2017 Information technology - Internet of things (IoT) - IoT use cases

 **URL:** <https://www.iso.org/standard/73148.html?browse=tc>

ABSTRACT: ISO/IEC TR 22417:2017(E) This technical report identifies IoT scenarios and use cases based on real-world applications and requirements. The use cases provide a practical context for considerations on interoperability and standards based on user experience. They also clarify where existing standards can be applied and highlight where standardization work is needed.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2017-11

oneM2M TR-0001-V2.4.1 oneM2M - Use Case collection

 **URL:** https://www.onem2m.org/images/files/deliverables/Release2/TR-0001-Use_Cases_Collection-V2.4.1.pdf


ABSTRACT: The present document includes a collection of use cases from a variety of M2M industry segments. Each use case may include a description, source, actors, pre-conditions, triggers, normal and alternative flow of sequence of interactions among actors and system, post-conditions, illustrations and potential requirements. The potential requirements provide an initial view of what oneM2M requirements could arise from the Use Case as seen by the contributor. These are intended to help the reader understand the use case's needs. These potential requirements may have been subsequently submitted by the contributor for consideration as candidate oneM2M requirements, which may or may not have been agreed as a oneM2M requirement (often after much editing). As such, there may not be a direct mapping from the potential requirements to agreed oneM2M requirements.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2016-08

■ Mobility

5GAA Tele-operated Driving Use Cases, System Architecture and Business Considerations

 **URL:** <https://5gaa.org/news/tele-operated-driving-use-cases-system-architecture-and-business-considerations/>


ABSTRACT: The evolution of driving automation technology is gradually reducing our dependence on human drivers. Tele-operated Driving (ToD) technology separates drivers or driving automation systems from the physical vehicle, effectively operating it from a remote location. ToD thus enables shared remote assistance or remote driving services from a central location, which has the benefit of reducing labour costs (fewer drivers), while improving safety and comfort for the drivers.

This 5GAA white paper describes the technical and business framework, and a visionary roadmap for ToD services. Different ToD types, which are classified according to the impact on the operation level of an automated vehicle, are studied under the different environments such as automated vehicle parking areas, or public roads or even using different mobile networks. This white paper is an abstract of the following published 5GAA ToD technical reports, where interested readers can find further technical details and business considerations on ToD services.


 **DOCUMENT TYPE:** Whitepaper

 **PUBLICATION DATE:** 2021-12

oneM2M-TR-0026-V-4.8.0 Vehicular Domain Enablement

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=31410>

ABSTRACT: This oneM2M Technical Report examines how the current oneM2M System can be used in the Vehicular Domain and includes a study of advanced features which the future oneM2M release(s) could support for this vertical domain.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2019-12

■ Connectivity

■ Buildings

IETF RFC5867 Building Automation Routing Requirements in Low-Power and Lossy Networks

 **URL:** <https://datatracker.ietf.org/doc/rfc5867/>


ABSTRACT: The Routing Over Low-Power and Lossy (ROLL) networks Working Group has been chartered to work on routing solutions for Low-Power and Lossy Networks (LLNs) in various markets: industrial, commercial (building), home, and urban networks. Pursuant to this effort, this document defines the IPv6 routing requirements for building automation.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2010-06

■ Health

HL7 International HL7 V2.9 HL7 Version 2 Messaging Standard

 **URL:** http://www.hl7.org/implement/standards/product_brief.cfm?product_id=516


ABSTRACT: Communications/Networking, Data and Information Management - Electronic data exchange between systems in the clinical domain. The standard is designed to support a central patient care system as well as a more distributed environment where data resides in departmental systems.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2019-12

■ Home

IETF RFC5826 Home Automation Routing Requirements in Low-Power and Lossy Networks

 **URL:** <https://datatracker.ietf.org/doc/rfc5826/>

ABSTRACT: This document presents requirements specific to home control and automation applications for Routing Over Low power and Lossy (ROLL) networks. In the near future, many homes will contain high numbers of wireless devices for a wide set of purposes. Examples include actuators (relay, light dimmer, heating valve), sensors (wall switch, water leak, blood pressure), and advanced

controllers (radio-frequency-based AV remote control, central server for light and heat control). Because such devices only cover a limited radio range, routing is often required. The aim of this document is to specify the routing requirements for networks comprising such constrained devices in a home-control and automation environment.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2010-04

■ Horizontals & Verticals

3GPP TR 36.763 V17.0.0 Study on Narrow-Band Internet of Things (NB-IoT) / enhanced Machine Type Communication (eMTC) support for Non-Terrestrial Networks (NTN)

🔗 URL: <https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3747>

ABSTRACT: The objectives for this document are, based on the outcomes of the Release-17 NR NTN WI and Release-16 TR 38.821, to study a set of necessary features/adaptations enabling the operation of the IoT NTN for 3GPP Release 17 with a priority on satellite access.

The first objective of this Study is to identify scenarios applicable to NB-IoT/eMTC, including:

- 🔗 Bands of interest in sub 6 GHz
- 🔗 Device type with PC3 or PC5 (LEO and GEO)
- 🔗 Satellite constellation orbit LEO and GEO
- 🔗 Transparent payload.
- 🔗 Link budget

The second objective is, for the above identified scenarios, to study and recommend necessary changes to support NB-IoT and eMTC over satellite, reusing as much as possible the conclusions of the studies performed for NR NTN in TR38.821. This objective will address the following items:

- 🔗 Aspects related to random access procedure/signals
- 🔗 Mechanisms for time/frequency adjustment including Timing Advance, and UL frequency compensation indication
- 🔗 Timing offset related to scheduling and HARQ-ACK feedback
- 🔗 Aspects related to HARQ operation
- 🔗 General aspects related to timers (e.g. SR, DRX, etc.)
- 🔗 RAN2 aspects related to idle mode and connected mode mobility [RAN2]
- 🔗 RLF-based for NB-IoT
- 🔗 Handover-based for eMTC
- 🔗 System information enhancements
- 🔗 Tracking area enhancements

Recommendations for NB-IoT and recommendations for eMTC will be documented in the conclusions.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2021-06

3GPP TR 36.802 V13.0.0 Evolved Universal Terrestrial Radio Access (E-UTRA); NB-IOT; Technical Report for BS and UE radio transmission and reception


 **URL:** https://www.3gpp.org/ftp/Specs/archive/36_series/36.802/

ABSTRACT: The present document summarizes the studies of radio requirements for BS and UE radio transmission and reception as part of the work item on Narrowband Internet of Things (NB-IoT).

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2016-06

5G PPP 5G PPP H2020 ICT-18-2018 5G Trials for Cooperative, Connected and Automated Mobility along European 5G Cross-Border Corridors - Challenges and Opportunities

 **URL:** https://5g-ppp.eu/wp-content/uploads/2020/10/5G-for-CCAM-in-Cross-Border-Corridors_5G-PPP-White-Paper-Final2.pdf

ABSTRACT: The white paper focuses on 5G infrastructure along the main EU transport paths, to enable a series of advanced Cooperative, Connected and Automated Mobility (CCAM) use cases and services across Europe. It introduces the scope, use cases, trial sites and particularities of each of the related corridor projects. It also identifies and elaborates on the main concerns and challenges arising from deploying advanced CCAM use cases at regional borders. This analysis takes into consideration technological, administrative, security and legislative aspects.

 **DOCUMENT TYPE:** Whitepaper

 **PUBLICATION DATE:** 2020-10

AIOTI Identifiers in Internet of Things (IoT)

 **URL:** https://aioti.eu/wp-content/uploads/2018/03/AIOTI-Identifiers_in_IoT-1_0.pdf.pdf

ABSTRACT: Identification is a major topic in Internet of Things (IoT). Besides identification of the things itself, many other entities have to be identified in IoT solutions. In this paper we discuss the various identification needs with related use cases and requirements. Furthermore we look at identifier standards, their applicability for the different identifier needs and discuss identifier allocation, registration, resolution, security, privacy and interoperability. The starting point for this deliverable was a survey that was conducted in spring 2017 within the IoT standardization and research community. This survey is a significant input to this deliverable, along with several research and standardisation documents related to IoT identities. Due to the large application area for IoT and the wide landscape of standardization activities, research work, technologies and already existing IoT platforms and solutions the paper can only provide a general overview. It does not claim to cover the whole space of IoT use cases, requirements and standards for identifiers. The document provides a high level discussion on the above topics. It provides a structured approach by classification of identifier usage and a categorization of requirements. In general no single identification scheme fits all needs. Furthermore many identification are already standardized and in use. It therefore does not define or recommend specific solutions and standards, but provides examples and summaries in order to indicate what has to be taken into account when considering identifiers in IoT. This also includes different topics related to interoperability of identifiers. Furthermore security and privacy are raised as important topics for identifiers and appropriate threat and risk analysis have to be performed and relevant regulatory and legal framework have to be taken into account.

 **DOCUMENT TYPE:** Landscape

 **PUBLICATION DATE:** 2018-02

bioTope D3.5 Prototype of Platform Integration using API Mediators

 **URL:** <https://st11.ning.com/topology/rest/1.0/file/get/1065014?profile=original>

ABSTRACT: This document is a part of the definition of the overall bioTope Systems of Systems (SoS) ecosystem architecture by providing state-of-the-art framework for information source publication and consumption developed around Open API standards including Open Messaging Interface (O-MI) and Open Data Format (O-DF) specifications. This SoS platform will enable users, developers, and resource providers to publish, consume, compose, and integrate services in order to explain the coordination of various platforms with the standardized APIs. For the platform to be successful, the APIs and platforms need to be robust and better managed, acting as technological foundation for an open Internet of Things (IoT) innovation ecosystem.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2017-06

bioTope D3.6 V2.0 Information Source Publication and Consumption Framework

 **URL:** <https://storage.ning.com/topology/rest/1.0/file/get/35619932?profile=original>

ABSTRACT: The main objective of this document is to present the final version of the mechanisms used to enable IoT device and IoT-related information systems to publish their presence, and be discovered by, other IoT systems, by extending the discovery functionality provided by O-MI and O-DF standards with geo-location and semantic web discovery methods (e.g., describing meta-data about different services).

 **DOCUMENT TYPE:** Framework

 **PUBLICATION DATE:** 2018-01

bioTope D5.2 V1.0 Service Composition Framework

 **URL:** <https://st11.ning.com/topology/rest/1.0/file/get/1064994?profile=original>

ABSTRACT: This document discusses the problem domain of IoT service composition and outlines the bioTope approach to overcome the identified problems by introducing an exemplary setting that helps illustrating the basic principles. The document also concretizes the methods by examples based on real-world data and describes the architecture and integration method chosen to implement the data-integration platform that follows the suggested approach and drives the service composition framework. Finally, the document provides an overview on tools for graphical user interaction that may be used as a frontend for service composition, and discusses related work that has already been done in the field.

 **DOCUMENT TYPE:** Framework

 **PUBLICATION DATE:** 2017-01

bioTope D5.5 V2.0 Service Composition Framework

 **URL:** <https://storage.ning.com/topology/rest/1.0/file/get/35619974?profile=original>

ABSTRACT: This document presents an approach for standardized workflow composition between bioTope XaaS components. It shows how this approach can be implemented on a technical level as a framework. The framework resembles a toolbox of building blocks that allow the definition of workflows between bioTope XaaS components, thus fostering integration and interoperability. It is centered around an open-source visual programming environment (Node-RED). It contains visual representations (nodes) of XaaS components provided by the bioTope consortium, to compose

bloTope services, as well as predefined workflows and useful services that aim to support end-users in orchestrating and working with bloTope components.

📄 DOCUMENT TYPE: Framework

📅 PUBLICATION DATE: 2017-12

CEN EN 13757-3:2018 Communication systems for meters - Part 3: Application protocols

🔗 URL: https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:61820&cs=1699FDB9F0D54F7BB01D7266589ED286A

ABSTRACT: This European Standard specifies application protocols for communication systems for meters and remote reading of meters. This European Standard specifies application protocols, especially the M-Bus application protocol. This European Standard is intended to be used with the lower layer specifications determined in EN 13757-2, EN 13757-4, EN 13757-5, EN 13757-6 and prEN 13757-7.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2018-10

CEN EN 13757-4:2019 Communication systems for meters - Part 4: Wireless M-Bus communication

🔗 URL: https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:60262&cs=156CDF6A723103E3251766A06586779B6

ABSTRACT: This European Standard specifies the requirements of parameters for the physical and the link layer for systems using radio to read remote meters. The primary focus is to use the Short Range Device (SRD) unlicensed telemetry bands. The standard encompasses systems for walk-by, drive-by and fixed installations. As a broad definition, this European Standard can be applied to various application layers.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2019-11

CEN EN 13757-6:2015 Communication systems for meters - Part 6: Local Bus

🔗 URL: https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:41515&cs=14E87496D5D72D87C65ABEBFFCB3BD0AB

ABSTRACT: This European Standard specifies the physical layer parameters of a local meter readout system (Local Bus) for the communication with and the readout of a single meter or a small cluster of meters via a single battery powered readout device (master) which can be connected temporarily or stationary for the communication directly to a meter (i.e. local readout) or via a fixed wiring or a small bus (i.e. remote readout). For generic descriptions concerning communication systems for meters and remote reading of meters, refer to EN 13757-1.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2016-06

CEN EN 13757-7:2018 Communication systems for meters - Part 7: Transport and security services

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:61822&cs=107399C785EC0B2EDACF60D74955A90D5

ABSTRACT: This European Standard specifies Transport and Security Services for communication systems for meters and remote reading of meters. In particular, (1) it specifies secure communication capabilities by design and supports the building of a secure system architecture, (2) is applicable to the protection of consumer data to ensure privacy, (3) is intended to be used with the lower layer specifications determined in EN 13757-2, EN 13757-3, EN 13757-4, EN 13757-5 and EN 13757-6.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-10

CEN EN 1434-3:2015 Heat meters - Part 3: Data exchange and interfaces

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:41516&cs=157EF44C329D0ADE1DB97DF0406BAA443

ABSTRACT: This European Standard specifies the general requirements and applies to heat meters. Heat meters are instruments intended for measuring the energy which in a heat-exchange circuit is absorbed (cooling) or given up (heating) by a liquid called the heat-conveying liquid. The meter indicates heat in legal units. Part 3 specifies the data exchange between a meter and a readout device (POINT / POINT communication). For these applications using the optical readout head, the EN 62056-21 protocol is recommended. For direct or remote local readout of a single or a few meters via a battery driven readout device, the physical layer of EN 13757-6 (local bus) is recommended. For bigger networks with up to 250 meters, a master unit with AC mains supply according to EN 13757-2 is necessary to control the M-Bus. For these applications the physical and link layer of EN 13757-2 and the application layer of EN 13757-3 is required. For wireless meter communications, EN 13757-4 describes several alternatives of walk/drive-by readout via a mobile station or by using stationary receivers or a network. Both unidirectionally and bidirectionally transmitting meters are supported by this standard.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-06

CEN EN 16836-2:2016 Communication systems for meters - Wireless mesh networking for meter data exchange - Part 2: Networking layer and stack specification

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:41099&cs=181323929D1945B365914E7CE01F502AD

ABSTRACT: This European Standard specifies the medium access control/physical layer MAC/PHY and networking layer of a communication protocol for the exchange of data from metering devices to other devices within a mesh network. The referenced documents in this European Standard contain specifications, interface descriptions, object descriptions, protocols and algorithms pertaining to this protocol standard, the device objects, device profile, the application framework, the network layer, and security services. They are referenced in their entirety for reasons of backwards compatibility and interoperability with products in the field currently using this technology.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-05

CEN EN 16836-3:2016 Communication systems for meters - Wireless mesh networking for meter data exchange - Part 3: Energy profile specification dedicated application layer

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:41100&cs=1C46CE950442B0C43F9EDDAC4585ACF19

ABSTRACT: This European Standard specifies the application layer of a communication protocol for the exchange of data from metering devices to other devices within a mesh network. It makes reference to a number of documents whereby core requirements are specified. This referencing is in compliance with the Bridge Consortium and additionally the Memorandum of Understanding between the ZigBee Alliance and CEN/CENELEC. The EN 16836 series represents a feature subset of a larger standard and as such not all of the features specified in the referenced documents are specified in this standard, due to some features being outside the scope of CEN/TC 294. Where this is the case the out of scope feature has either been omitted or specified as excluded.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-05

CEN/TR 17167:2018 Communication system for meters - Accompanying TR to EN 13757-2,-3 and -7, Examples and supplementary information

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:61828&cs=1338F0A4C7239D0EC0470C6E1605E2BCF

ABSTRACT: This Technical Report contains additional information to the requirements determined in EN 13757-2, EN 13757-3 and EN 13757-7. In particular, it provides examples for the implementation, Datagram examples secured by security mechanism of part 7 and additional non-normative requirements beyond meter communication itself.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2018-04

Contiki-NG Contiki-NG, the OS for Next Generation IoT Devices

 **URL:** <https://www.contiki-ng.org/>

ABSTRACT: Contiki-NG is an operating system for resource-constrained devices in the Internet of Things. Contiki-NG contains an RFC-compliant, low-power IPv6 communication stack, enabling Internet connectivity. The system runs on a variety of platforms based on energy-efficient architectures such as the ARM Cortex-M3/M4 and the Texas Instruments MSP430. The code footprint is on the order of a 100 kB, and the memory usage can be configured to be as low as 10 kB. The source code is available as open source with a 3-clause BSD license.

 **DOCUMENT TYPE:** Framework

 **PUBLICATION DATE:** 2017/01

CSA-IoT ZigBee Document 13-0402-14 Base Device Behaviour Specification

 **URL:** <https://csa-iot.org/developer-resource/specifications-download-request/>

ABSTRACT: The purpose of this specification is to clearly define the environment, initialization, commissioning and operating procedures of a base device operating on the ZigBee® PRO stack to

ensure profile interoperability. Commissioning devices into networks has been made more consistent through this specification

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2016-02

CSA-IOT Zigbee Document 05-3474-22 Zigbee Specification

🔗 URL: <https://csa-iot.org/developer-resource/specifications-download-request/>

ABSTRACT: This document contains specifications, interface descriptions, object descriptions, protocols and algorithms pertaining to the ZigBee® protocol standard. ZigBee® technology uses the globally available, license-free 2,4 GHz frequency band. It enables wireless applications using a standardized set of high-level communication protocols sitting atop low-power digital radios based on the IEEE 802.15.4 standard for wireless personal area networks.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2017-04

CSA-IOT Zigbee Document 075123 Cluster Library Specification

🔗 URL: <https://csa-iot.org/developer-resource/specifications-download-request/>

ABSTRACT: The ZigBee® Cluster Library specification (ZCL) defines cluster functionality as a common platform for developers of ZigBee® applications as well as its data model. This is needed to create ZigBee® devices that are inter-operable at the application level.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2019-12

ETSI EN 300 175-1 Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview

🔗 URL: http://www.etsi.org/deliver/etsi_en/300100_300199/30017501/02.09.01_60/en_30017501v020901p.pdf

ABSTRACT: This standard gives an introduction and overview of the complete Digital Enhanced Cordless Telecommunications (DECT) Common Interface (CI).

It contains an abstract of the other parts of the DECT standard together with a general description of: the objectives of the standard; the DECT Common Interface; the protocol architecture of DECT.

The standard also provides an extensive vocabulary; in particular it contains the common definitions of all the technical terms used in different parts of the standard.


The standard includes New Generation DECT, a further development of the DECT standard introducing wideband speech, improved data services, new slot types and other technical enhancements. The standard includes DECT Evolution.

This is the first part of a multi-part standard with Part 1: Overview; Part 2: Physical Layer (PHL); Part 3: Medium Access Control (MAC) layer; Part 4: Data Link Control (DLC) layer; Part 5: Network (NWK) layer; Part 6: Identities and addressing; Part 7: Security features; Part 8: Speech and audio coding and transmission.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2022-03

ETSI EN 302 065-1 Short Range Devices (SRD) using Ultra Wide Band technology (UWB); Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 1: Requirements for Generic UWB applications

 **URL:** http://www.etsi.org/deliver/etsi_en/302000_302099/30206501/02.01.01_60/en_30206501v020101p.pdf

ABSTRACT: This standard applies to transceivers, transmitters and receivers utilizing Ultra WideBand (UWB) technologies and used for short range applications.

It applies to impulse, modified impulse and RF carrier based UWB communication technologies. The standard applies to fixed (indoor only), mobile or portable applications, e.g.: stand-alone radio equipment with or without its own control provisions; plug-in radio devices intended for use with, or within, a variety of host systems, e.g. personal computers, hand-held terminals, etc.; plug-in radio devices intended for use within combined equipment, e.g. cable modems, set-top boxes, access points, etc.; combined equipment or a combination of a plug-in radio device and a specific type of host equipment.

It is the first part of a multi-part standard, with Part 1: Requirements for Generic UWB applications; Part 2: Requirements for UWB location tracking; Part 3: Requirements for UWB devices for ground based vehicular applications; Part 4: Material Sensing devices using UWB technology below 10,6 GHz; Part 5: Devices using UWB technology onboard aircraft.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-11

ETSI GR IP6 001 IPv6 Deployment in the Enterprise

 **URL:** https://www.etsi.org/deliver/etsi_gr/IP6/001_099/001/01.01.01_60/gr_IP6001v010101p.pdf

ABSTRACT: This document outlines the motivation for the deployment of IPv6 in enterprises, the objectives, the benefits, the risks, the challenges, the technology guidelines, the different choices that arise when designing IPv6-only or dual-stack enterprise network, step-by-step process, the addressing plan, and the milestones.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2017-06

ETSI GR IP6 008 IPv6-based Internet of Things Deployment of IPv6-based Internet of Things

 **URL:** https://www.etsi.org/deliver/etsi_gr/IP6/001_099/008/01.01.01_60/gr_IP6008v010101p.pdf

ABSTRACT: The present document outlines the motivation for IPv6 in IoT, the technical challenges to address IoT on constrained devices and networks, the impact on the IPv6 technology and protocols, the technology guidelines, the step by step process, the benefits, the risks, as applicable to IoT domains including: M2M, Energy, Industrial, Mining, Oil and gas, Smart city, Transportation (including EVs), etc. IPv6-based IoT in this context refers to the connectivity network layers needed to support the communication between things. It is understood that a complete IoT system may use of an IoT architecture including but not necessarily an abstraction layer part of an IoT platform. The description of such IoT platform is out of the scope of the present document.


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2017-06

ETSI GS LTN 002 Low Throughput Networks (LTN) - Functional Architecture

 **URL:** https://www.etsi.org/deliver/etsi_gs/LTN/001_099/002/01.01.01_60/gs_LTN002v010101p.pdf

ABSTRACT: The present document aims to: (1) describe the characteristics of the architecture of a Low Throughput Network, (2) illustrate the applicability of LTN in industrial communication, (3) highlight the specificity of LTN deployment


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2014-09

ETSI GS LTN 003 Low Throughput Networks (LTN) - Protocols and Interfaces

 **URL:** https://www.etsi.org/deliver/etsi_gs/LTN/001_099/003/01.01.01_60/gs_LTN003v010101p.pdf

ABSTRACT: The document aims to define the protocols and interfaces of LTN (Low Throughput Network) systems. It goes along with the document GS LTN 002, on LTN functional architecture.


















 **DOCUMENT TYPE:** Standard_Specification


 **PUBLICATION DATE:** 2014-09

ETSI GS NGP 005 Next Generation Protocol Requirements

 **URL:** https://www.etsi.org/deliver/etsi_gs/NGP/001_099/005/01.01.01_60/gs_NGP005v010101p.pdf

ABSTRACT: The scope of the Standard is to specify the minimum set of key requirements for the Next Generation Protocols (NGP), Industry Specific Group (ISG). The present document addresses requirements in the following areas:

-  Business Case and Techno-Economics
-  Migration
-  General Technical Requirements
-  Addressing
-  Security
-  Mobility
-  Multi-Access Support (including FMC)
-  Context Awareness
-  Performance (including Content Enablement)
-  Network Virtualisation
-  IoT Support
-  Energy Efficiency
-  e-Commerce
-  MEC
-  Mission Critical Services
-  Drones and Autonomous Vehicles and Connected Vehicles
-  Ultra Reliable Low Latency Communications

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-04

ETSI TR 103 249 Low Throughput Network (LTN); Use Cases and System Characteristics


 **URL:** http://www.etsi.org/deliver/etsi_tr/103200_103299/103249/01.01.01_60/tr_103249v010101p.pdf

ABSTRACT: This report provides illustrative use cases for Low Throughput Network (LTN) Systems and key characteristics of such systems to support the development of the LTN Standard.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2017-10

ETSI TR 103 467 Speech and multimedia Transmission Quality (STQ); Quality of Service aspects for IoT; Discussion of QoS aspects of services related to the IoT ecosystem

 **URL:** https://www.etsi.org/deliver/etsi_tr/103400_103499/103467/01.01.01_60/tr_103467v010101p.pdf

ABSTRACT: The present document discusses Quality of Service (QoS) aspects of services related to the Internet of Things (IoT) ecosystem from an end-to-end perspective; a strict end-user, service-oriented point of view. Here, end-to-end is understood as “from a service user/terminal/provider to a service user/terminal/provider”.

The report deals with two questions. The first question is if the existing framework for QoS parameter definitions and methodologies is sufficient to also include the IoT angle of view. The second question is if the existing portfolio of QoS parameters needs extensions or adaptations.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2018-06

ETSI TR 103 514 DECT; DECT-2020 New Radio (NR) interface; Study on Physical (PHY) layer

 **URL:** https://www.standict.eu/sites/default/files/2021-01/tr_103514v010101p.pdf

ABSTRACT: The document aims on studying “DECT-2020: New Radio”, a new radio interface based on state of the art paradigms able to offer the required data rates, propagation characteristics and spectrum efficiency, while maintaining compatibility with the carrier and time structure of the DECT band.


The document is focused on the Physical layer. DECT-2020, as defined by this report, is based on OFDM and may support space multiplexing (MIMO). The study focuses on:

- 1) Review of use cases and key application areas for DECT-2020.
- 2) Identification of methodology, initial sources, simulation tools and models.
- 3) Initial definition of “DECT-2020: New Radio” PHY layer, providing guidance for a following technical specification.
- 4) Preliminary simulation results and preliminary study on spatial multiplexing (MIMO).

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2018-07

ETSI TS 102 939-1 DECT; Ultra Low Energy (ULE); Machine to Machine Communications; Part 1: Home Automation Network (phase 1)

 **URL:** https://www.etsi.org/deliver/etsi_ts/102900_102999/10293901/01.03.01_60/ts_10293901v010301p.pdf

ABSTRACT: The present document specifies the first set of functionalities of the ETSI radio technology named DECT Ultra Low Energy (ULE).

The set of features defined in the present document is named “Home Automation Network (HAN), phase 1”, and is primarily targeted to provide a global M2M solution within domestic scenarios. However, this does not prevent the use of the present document in other scenarios.

DECT Ultra Low Energy (ULE) provides bi-directional radio communication with medium range, data protection, and Ultra Low Power consumption between different types of Portable Devices and Radio Fixed Parts.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2017-10

ETSI TS 103 357 Short Range Devices; Low Throughput Networks (LTN); Protocols for radio interface A

📄 URL: http://www.etsi.org/deliver/etsi_ts/103300_103399/103357/01.01.01_60/ts_103357v010101p.pdf

ABSTRACT: The present document specifies the radio protocols of three radio technologies, referred to as “families”. It contains an implementable description of physical and MAC/link protocol layers. It concludes with a section on implementation commonalities between the three LTN families.

NOTE: ETSI TR 103 249 describes LTN use cases and system characteristics. ETSI TS 103 358 specifies the architecture of LTN systems.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2018-06

ETSI TS 103 358 Short range devices; Low Throughput Networks (LTN) Architecture; LTN Architecture

📄 URL: http://www.etsi.org/deliver/etsi_ts/103300_103399/103358/01.01.01_60/ts_103358v010101p.pdf

ABSTRACT: The Internet of Things (IoT) presents a wide and growing range of communications requirements. Certain of these requirements are addressed by systems which are referred to as ‘Low Throughput Networks’ (LTN) in ETSI documents. The use cases addressed by LTN systems and the LTN systems characteristics are provided in ETSI TR 103 249. LTN systems may be considered to be a subset of Low Power Wide Area Networks (LPWAN), that may include other systems, already existing or developed in the future.

This standard specifies the architecture of LTN systems. It contains requirements and/or recommendations on functional blocks and interfaces that are related to the architecture (i.e. high-level description) of LTN systems. It develops the work done in LTN ISG (ETSI GS LTN 002) on architecture for LTN systems. The present document should be read in conjunction with ETSI TR 103 249 and related documents, in which details of entities and interfaces are documented.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2018-06

ETSI TS 103 596-1 V1.1.1 (Methods for Testing and Specification (MTS); Test Specification for CoAP; Part 1: Conformance Tests

📄 URL: https://www.etsi.org/deliver/etsi_ts/103500_103599/10359601/01.01.01_60/ts_10359601v010101p.pdf

ABSTRACT: While the Internet of Things (IoT) is on the rise, the quality assurance of interconnected systems becomes an everincreasing challenge. Within the last years, many different IoT protocols came to the fore. The present document provides a test specification, i.e. an overall test suite structure

and catalogue of test purposes for the Constrained Application Protocol (CoAP). It will be a reference base for both client-side test campaigns and serverside test campaigns addressing the conformance issues.

In the present document the conformance testing is presented. It provides a basis for interoperability testing and performance testing. The latter is presented in ETSI TS 103 536-3.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2021-05

ETSI TS 103 596-2 V1.1.1 Methods for Testing and Specification (MTS); Test Specification for CoAP; Part 2: Security Tests

📄 URL: https://www.etsi.org/deliver/etsi_ts/103500_103599/10359602/01.01.01_60/ts_10359602v010101p.pdf

ABSTRACT: The present document provides an introduction and guide for developers and users investigating in security testing of the Constrained Application Protocol (COAP) communication protocol. It will be a reference base for both client side test campaigns and server side test campaigns addressing the security issues. It belongs to a multi-part deliverable addressing the most relevant testing aspects of COAP: conformance, security and performance testing. While the conformance testing part presents a complete set of test purposes, the content for security and performance parts is different and focus on evaluating relevant testing techniques and the provision of samples that are specific for COAP. For this reason, the structure of the present document consists of four main clauses: the first two clauses address the security test objectives, techniques and methods to be considered for COAP. Concrete practical hints and samples and configuration notes are provided where feasible. The latter two clauses focus on the security mechanisms and implementation notes mentioned in the COAP protocol standard and security vulnerabilities known from relevant vulnerability databases. Concrete test purposes have been described using the Test Description Language (TDL) standardized by ETSI.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2021-05

ETSI TS 103 596-3 V1.1.1 Methods for Testing and Specification (MTS); Test Specification for CoAP; Part 3: Performance Tests

📄 URL: https://www.etsi.org/deliver/etsi_ts/103500_103599/10359603/01.01.01_60/ts_10359603v010101p.pdf

ABSTRACT: The present document provides an introduction and possible test specification, i.e. an overall test suite structure and catalogue of performance test purposes for the Constrained Application Protocol (CoAP) protocol. It will be a reference base for both client side test campaigns and server side test campaigns addressing the performance issues.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2021-05

ETSI TS 103 597-1 V1.1.2 Methods for Testing and Specification (MTS); Test Specification for MQTT; Part 1: Conformance Tests

📄 URL: https://www.etsi.org/deliver/etsi_ts/103500_103599/10359701/01.01.02_60/ts_10359701v010102p.pdf

ABSTRACT: While the Internet of Things (IoT) is on the rise, the quality assurance of interconnected systems becomes an ever-increasing challenge. Within the last years, many different IoT protocols came to the fore. The MQ Telemetry Transport (MQTT) protocol is one of the most popular representatives as many surveys have shown. Although many implementations for the MQTT protocol exist, it lacks in

satisfying quality assurance. While many IoT components communicate over standardized protocols, communication protocols for IoT like MQTT or CoAP evolved over time without a holistic approach for quality assurance. In the present document the conformance testing is presented. It provides a basis for interoperability testing and performance testing. The latter is presented in ETSI TS 103 597-3.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2021-01

ETSI TS 103 597-2 V1.1.1 Methods for Testing and Specification (MTS); Test Specification for MQTT; Part 2: Security Tests

📄 URL: https://www.etsi.org/deliver/etsi_ts/103500_103599/10359702/01.01.01_60/ts_10359702v010101p.pdf

ABSTRACT: The present document provides an introduction and guide for developers and users investigating in security testing of the Message Queue Telemetry Transport (MQTT) communication protocol. It will be a reference base for both client side test campaigns and server side test campaigns addressing the security issues. It belongs to a multipart technical specification addressing the most relevant testing aspects of MQTT: (1) conformance; (2) security; and (3) performance testing.

While the conformance testing part presents a complete set of test purposes, the content for security and performance parts is different and focus on evaluating relevant testing techniques and the provision of samples that are specific for MQTT. For this reason, the structure of the document consists of four main clauses: the first two clauses address the security test objectives, techniques and methods to be considered for MQTT. Concrete practical hints and samples and configuration notes are provided where feasible. The latter two clauses focus on the security mechanisms and implementation notes mentioned in the MQTT protocol standard and security vulnerabilities known from relevant vulnerability databases. Concrete test purposes have been described using the Test Description Language (TDL) standardized by ETSI.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2021-04

ETSI TS 103 597-3 V1.1.1 Methods for Testing and Specification (MTS); Test Specification for MQTT; Part 3: Performance Tests

📄 URL: https://www.etsi.org/deliver/etsi_ts/103500_103599/10359703/01.01.01_60/ts_10359703v010101p.pdf

ABSTRACT: Technology advancements are bringing ever-increasing computing power and network speed in the communication domain. The number of communicating devices is expected to increase by 2 orders of magnitude in the following decade and with that several challenges emerge. A main challenge pertains to efficiency regarding resource consumption and overall performance.

As existing communication protocols evolve and new ones are created to fit the current technological capabilities and societal needs and the standards that serve the basis for interoperability and compliance. This is most relevant in the foreseen context of the Internet of Things (IoT) which envisions a very high density of connected devices in the near future. The Message Queuing Telemetry Transport (MQTT) protocol is one such example of evolution. While many IoT components communicate over standardized protocols, communication protocols for IoT like MQTT or CoAP evolved over time without a holistic approach for quality assurance. Although there are many published evaluations of various MQTT implementations, a lack of common language, methods and presentation of results is slowing down the adoption rate and overall evolution of the protocol. In the present document the performance testing is presented. It provides a basis for benchmark testing and performance evaluation for the MQTT protocol.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2021-01

FIT IoT-LAB Testbed The Very Large Scale Internet of Things Testbed

 **URL:** <https://www.iot-lab.info/>

ABSTRACT: IoT-LAB provides a facility suitable for testing networking with small wireless sensor devices and heterogeneous communicating objects.

 **DOCUMENT TYPE:** Framework

 **PUBLICATION DATE:** 2014-06

FIWARE Foundation FIWARE Internet of Things Framework


 **URL:** <https://www.fiware.org/>

ABSTRACT: FIWARE Foundation drives the definition – and the Open Source implementation – of key open standards that enable the development of portable and interoperable smart solutions in a faster, easier and affordable way, avoiding vendor lock-in scenarios, whilst also nurturing FIWARE as a sustainable and innovation-driven business ecosystem.

 **DOCUMENT TYPE:** Open_Source

 **PUBLICATION DATE:** 2018-01

IEC 61406 ED1 Identification Link

 **URL:** https://www.iec.ch/ords/f?p=103:38:401030832849310:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:1452,23,104621

ABSTRACT: This document focuses on the specification of the Identification Link and is Under development.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under development

IEEE 802.1AS-2020 Standard for Local and Metropolitan Area Networks - Timing and Synchronization for Time-Sensitive Applications in Bridged Local Area Networks

 **URL:** <https://standards.ieee.org/ieee/802.1AS/7121/>

ABSTRACT: This standard defines a protocol and procedures for the transport of timing over bridged and virtual bridged local area networks. It includes the transport of synchronized time, the selection of the timing source (i.e., best master), and the indication of the occurrence and magnitude of timing impairments (i.e., phase and frequency discontinuities).

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-06

IETF draft-ietf-raw-technologies Reliable and Available Wireless Technologies

 **URL:** <https://datatracker.ietf.org/doc/draft-ietf-raw-technologies/>

ABSTRACT: This document presents a series of recent technologies that are capable of time synchronization and scheduling of transmission, making them suitable to carry time-sensitive flows with high reliability and availability.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2022-02

ietf RFC 7388 Definition of Managed Objects for IPv6 over Low-Power Wireless Personal Area Networks (6LoWPANs)

URL: <https://datatracker.ietf.org/doc/rfc7388/>

ABSTRACT: This document defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it defines objects for managing IPv6 over Low-Power Wireless Personal Area Networks (6LoWPANs).

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2010-10

ietf RFC 7973 Assignment of an Ethertype for IPv6 with Low-Power Wireless Personal Area Network (LoWPAN) Encapsulation

URL: <https://datatracker.ietf.org/doc/rfc7973/>

ABSTRACT: When carried over Layer 2 technologies such as Ethernet, IPv6 datagrams using Low-Power Wireless Personal Area Network (LoWPAN) encapsulation as defined in RFC 4944 must be identified so the receiver can correctly interpret the encoded IPv6 datagram. The IETF officially requested the assignment of an Ethertype for that purpose and this document reports that assignment.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2016-11

ietf RFC 8025 IPv6 over Low-Power Wireless Personal Area Network (6LoWPAN) Paging Dispatch

URL: <https://datatracker.ietf.org/doc/rfc8025/>

ABSTRACT: This specification updates RFC 4944 to introduce a new context switch mechanism for IPv6 over Low-Power Wireless Personal Area Network (6LoWPAN) compression, expressed in terms of Pages and signaled by a new Paging Dispatch.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2016-11

ietf RFC 8036 Applicability Statement for the Routing Protocol for Low-Power and Lossy Networks (RPL) in Advanced Metering Infrastructure (AMI) Networks

URL: <https://datatracker.ietf.org/doc/rfc8036/>

ABSTRACT: This document discusses the applicability of the Routing Protocol for Low-Power and Lossy Networks (RPL) in Advanced Metering Infrastructure (AMI) networks.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2017-01

IETF RFC 8065 Privacy Considerations for IPv6 Adaptation-Layer Mechanisms

 **URL:** <https://datatracker.ietf.org/doc/rfc8065/>

ABSTRACT: This document discusses how a number of privacy threats apply to technologies designed for IPv6 over various link-layer protocols, and it provides advice to protocol designers on how to address such threats in adaptation-layer specifications for IPv6 over such links.


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2017-02

IETF RFC 8066 IPv6 over Low-Power Wireless Personal Area Network (6LoWPAN) ESC Dispatch Code Points and Guidelines

 **URL:** <https://datatracker.ietf.org/doc/rfc8066/>

ABSTRACT: RFC 4944 defines the ESC dispatch type to allow additional dispatch octets in the 6LoWPAN header. The value of the ESC dispatch type was updated by RFC 6282; however, its usage was not defined in either RFC 6282 or RFC 4944. This document updates RFC 4944 and RFC 6282 by defining the ESC extension octet code points and listing registration entries for known use cases at the time of writing of this document.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-02

IETF RFC 8075 Guidelines for Mapping Implementations: HTTP to the Constrained Application Protocol (CoAP)

 **URL:** <https://datatracker.ietf.org/doc/rfc8075/>

ABSTRACT: This document provides reference information for implementing a cross-protocol network proxy that performs translation from the HTTP protocol to the Constrained Application Protocol (CoAP). This will enable an HTTP client to access resources on a CoAP server through the proxy. This document describes how an HTTP request is mapped to a CoAP request and how a CoAP response is mapped back to an HTTP response. This includes guidelines for status code, URI, and media type mappings, as well as additional interworking advice.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-02

IETF RFC 8105 Transmission of IPv6 Packets over Digital Enhanced Cordless Telecommunications (DECT) Ultra Low Energy (ULE)

 **URL:** <https://datatracker.ietf.org/doc/rfc8105/>

ABSTRACT: This document describes how IPv6 is transported over DECT ULE using IPv6 over Low-Power Wireless Personal Area Network (6LoWPAN) techniques.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-05

IETF RFC 8132 PATCH and FETCH Methods for the Constrained Application Protocol (CoAP)

 **URL:** <https://datatracker.ietf.org/doc/rfc8132/>

ABSTRACT: This specification defines the new CoAP methods, FETCH, PATCH, and iPATCH, which are used to access and update parts of a resource.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-04

IETF RFC 8138 IPv6 over Low-Power Wireless Personal Area Network (6LoWPAN) Routing Header

 **URL:** <https://datatracker.ietf.org/doc/rfc8138/>

ABSTRACT: This specification introduces a new IPv6 over Low-Power Wireless Personal Area Network (6LoWPAN) dispatch type for use in 6LoWPAN route-over topologies, which initially covers the needs of Routing Protocol for Low-Power and Lossy Networks (RPL) data packet compression (RFC 6550). Using this dispatch type, this specification defines a method to compress the RPL Option (RFC 6553) information and Routing Header type 3 (RFC 6554), an efficient IP-in-IP technique, and is extensible for more applications.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-04

IETF RFC 8163 Transmission of IPv6 over Master-Slave/Token-Passing (MS/TP) Networks

 **URL:** <https://datatracker.ietf.org/doc/rfc8163/>

ABSTRACT: Master-Slave/Token-Passing (MS/TP) is a medium access control method for the RS-485 physical layer and is used primarily in building automation networks. This specification defines the frame format for transmission of IPv6 packets and the method of forming link-local and statelessly autoconfigured IPv6 addresses on MS/TP networks.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-05

IETF RFC 8180 Minimal IPv6 over the TSCH Mode of IEEE 802.15.4e (6TiSCH) Configuration

 **URL:** <https://datatracker.ietf.org/doc/rfc8180/>

ABSTRACT: This document describes a minimal mode of operation for an IPv6 over the TSCH mode of IEEE 802.15.4e (6TiSCH) network. This minimal mode of operation specifies the baseline set of protocols that need to be supported and the recommended configurations and modes of operation sufficient to enable a 6TiSCH functional network. 6TiSCH provides IPv6 connectivity over a Time-Slotted Channel Hopping (TSCH) mesh composed of IEEE Std 802.15.4 TSCH links. This minimal mode uses a collection of protocols with the respective configurations, including the IPv6 Low-Power Wireless Personal Area Network (6LoWPAN) framework, enabling interoperable IPv6 connectivity over IEEE Std 802.15.4 TSCH. This minimal configuration provides the necessary bandwidth for network and security bootstrapping and defines the proper link between the IETF protocols that interface to IEEE Std 802.15.4 TSCH. This minimal mode of operation should be implemented by all 6TiSCH-compliant devices.


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2017-05

IETF RFC 8323 CoAP (Constrained Application Protocol) over TCP, TLS, and WebSockets

 **URL:** <https://datatracker.ietf.org/doc/rfc8323/>

ABSTRACT: This document outlines the changes required to use CoAP over TCP,TLS, and WebSockets transports. It also formally updates RFC 7641 for use with these transports and RFC 7959 to enable the use of larger messages over a reliable transport.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-02

IETF RFC 8368 Using an Autonomic Control Plane for Stable Connectivity of Network Operations, Administration, and Maintenance (OAM)

 **URL:** <https://datatracker.ietf.org/doc/rfc8368/>

ABSTRACT: This document describes how to integrate OAM processes with an autonomic control plane in order to provide stable and secure connectivity for those OAM processes.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2018-05

IETF RFC 8376 Low-Power Wide Area Network (LPWAN) Overview

 **URL:** <https://datatracker.ietf.org/doc/rfc8376/>

ABSTRACT: This memo is an informational overview of the set of LPWAN technologies being considered in the IETF and of the gaps that exist between the needs of those technologies and the goal of running IP in LPWANs.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2018-05

IETF RFC 8392 CBOR Web Token (CWT)

 **URL:** <https://datatracker.ietf.org/doc/rfc8392/>

ABSTRACT: CBOR Web Token (CWT) is a compact means of representing claims to be transferred between two parties. The claims in a CWT are encoded in the Concise Binary Object Representation (CBOR), and CBOR Object Signing and Encryption (COSE) is used for added application-layer security protection. A claim is a piece of information asserted about a subject and is represented as a name/value pair consisting of a claim name and a claim value. CWT is derived from JSON Web Token (JWT) but uses CBOR rather than JSON.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-05

IETF RFC 8480 6TiSCH Operation Sublayer (6top) Protocol (6P)

 **URL:** <https://datatracker.ietf.org/doc/rfc8480/>

ABSTRACT: This document defines the “IPv6 over the TSCH mode of IEEE 802.15.4e” (6TiSCH) Operation Sublayer (6top) Protocol (6P), which enables distributed scheduling in 6TiSCH networks. 6P

allows neighbor nodes to add/delete Time-Slotted Channel Hopping (TSCH) cells to/on one another. 6P is part of the 6TiSCH Operation Sublayer (6top), the layer just above the IEEE Std 802.15.4 TSCH Medium Access Control layer. 6top is composed of one or more Scheduling Functions (SFs) and the 6top Protocol defined in this document. A 6top SF decides when to add/delete cells, and it triggers 6P Transactions. The definition of SFs is out of scope for this document; however, this document provides the requirements for an SF.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2018-11

[IETF RFC 8505 Registration Extensions for IPv6 over Low-Power Wireless Personal Area Network \(6LoWPAN\) Neighbor Discovery](#)

🔗 URL: <https://datatracker.ietf.org/doc/rfc8505/>

ABSTRACT: This specification updates RFC 6775 -- the Low-Power Wireless Personal Area Network (6LoWPAN) Neighbor Discovery specification -- to clarify the role of the protocol as a registration technique and simplify the registration operation in 6LoWPAN routers, as well as to provide enhancements to the registration capabilities and mobility detection for different network topologies, including the Routing Registrars performing routing for host routes and/or proxy Neighbor Discovery in a low-power network.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2018-11

[IETF RFC 8516 “Too Many Requests” Response Code for the Constrained Application Protocol](#)

🔗 URL: <https://datatracker.ietf.org/doc/rfc8516/>

ABSTRACT: This document defines a new CoAP response code for a server to indicate that a client should reduce the rate of requests.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2019-01

[IETF RFC 8557 Deterministic Networking Problem statement](#)

🔗 URL: <https://datatracker.ietf.org/doc/rfc8557/>

ABSTRACT: This paper documents the needs in various industries to establish multi-hop paths for characterized flows with deterministic properties.


📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2019-05

IETF RFC 8710 Multipart Content-Format for the Constrained Application Protocol (CoAP)

 **URL:** <https://datatracker.ietf.org/doc/rfc8710/>

ABSTRACT: This memo defines application/multipart-core, an application- independent media type that can be used to combine representations of zero or more different media types (each with a Constrained Application Protocol (CoAP) Content-Format identifier) into a single representation, with minimal framing overhead.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-02

IETF RFC 8724 SCHC: Generic Framework for Static Context Header Compression and Fragmentation

 **URL:** <https://datatracker.ietf.org/doc/rfc8724/>

ABSTRACT: This document defines the Static Context Header Compression and fragmentation (SCHC) framework, which provides both a header compression mechanism and an optional fragmentation mechanism.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-04

IETF RFC 8929 IPv6 Backbone Router

 **URL:** <https://datatracker.ietf.org/doc/rfc8929/>

ABSTRACT: This document updates RFCs 6775 and 8505 in order to enable proxy services for IPv6 Neighbor Discovery by Routing Registrars called “Backbone Routers”. Backbone Routers are placed along the wireless edge of a backbone and federate multiple wireless links to form a single Multi-Link Subnet (MLSN).

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-11

IETF RFC 8992 Autonomic IPv6 Edge Prefix Management in Large-Scale Networks

 **URL:** <https://datatracker.ietf.org/doc/rfc8992/>

ABSTRACT: This document defines two autonomic technical objectives for IPv6 prefix management at the edge of large-scale ISP networks, with an extension to support IPv4 prefixes.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2021-05

IETF RFC 9008 Using RPL Option Type, Routing Header for Source Routes, and IPv6-in-IPv6 Encapsulation in the RPL Data Plane

 **URL:** <https://datatracker.ietf.org/doc/rfc9008/>

ABSTRACT: This document looks at different data flows through Low-Power and Lossy Networks (LLN) where RPL (IPv6 Routing Protocol for Low-Power and Lossy Networks) is used to establish routing.

The document enumerates the cases where RPL Packet Information (RPI) Option Type (RFC 6553), RPL Source Route Header (RFC 6554), and IPv6-in-IPv6 encapsulation are required in the data plane. This analysis provides the basis upon which to design efficient compression of these headers. This document updates RFC 6553 by adding a change to the RPI Option Type. Additionally, this document updates RFC 6550 by defining a flag in the DODAG Information Object (DIO) Configuration option to indicate this change and updates RFC 8138 as well to consider the new Option Type when the RPL Option is decompressed.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2021-04

IETF RFC 9011 Static Context Header Compression and Fragmentation (SCHC) over LoRaWAN

🔗 URL: <https://datatracker.ietf.org/doc/rfc9011/>

ABSTRACT: This document defines a profile of SCHC (RFC 8724) for use in LoRaWAN networks and provides elements such as efficient parameterization and modes of operation.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2021-04

IETF RFC 9016 Flow and Service Information Model for Deterministic Networking (DetNet)

🔗 URL: <https://datatracker.ietf.org/doc/rfc9016/>

ABSTRACT: This document describes the flow and service information model for Deterministic Networking (DetNet). These models are defined for IP and MPLS DetNet data planes.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2021-03

IETF RFC 9019 A Firmware Update Architecture for Internet of Things

🔗 URL: <https://datatracker.ietf.org/doc/rfc9019/>

ABSTRACT: This document provides the motivation for the standardization of a manifest format as a transport-agnostic means for describing and protecting firmware updates.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2021-04

IETF RFC 9024 Deterministic Networking (DetNet) Data Plane: IEEE 802.1 Time-Sensitive Networking over MPLS

🔗 URL: <https://datatracker.ietf.org/doc/rfc9024/>

ABSTRACT: This document specifies the Deterministic Networking data plane when Time-Sensitive Networking (TSN) networks are interconnected over a DetNet MPLS network.


📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2021-06

IETF RFC 9025 Deterministic Networking (DetNet) Data Plane: MPLS over UDP/IP

 **URL:** <https://datatracker.ietf.org/doc/rfc9025/>

ABSTRACT: This document specifies the MPLS Deterministic Networking (DetNet) data plane operation and encapsulation over an IP network. The approach is based on the operation of MPLS-over-UDP technology.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-04

IETF RFC 9030 An Architecture for IPv6 over the Time-Slotted Channel Hopping Mode of IEEE 802.15.4 (6TiSCH)

 **URL:** <https://datatracker.ietf.org/doc/rfc9030/>

ABSTRACT: This document describes a network architecture that provides low-latency, low-jitter, and high-reliability packet delivery. It combines a high-speed powered backbone and subnetworks using IEEE 802.15.4 time-slotted channel hopping (TSCH) to meet the requirements of low-power wireless deterministic applications.


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2021-05

IETF RFC 9031 Constrained Join Protocol (CoJP) for 6TiSCH

 **URL:** <https://datatracker.ietf.org/doc/rfc9031/>

ABSTRACT: This document describes the minimal framework required for a new device, called a “pledge”, to securely join a 6TiSCH (IPv6 over the Time-Slotted Channel Hopping mode of IEEE 802.15.4) network. The framework requires that the pledge and the JRC (Join Registrar/Coordinator, a central entity), share a symmetric key. How this key is provisioned is out of scope of this document. Through a single CoAP (Constrained Application Protocol) request-response exchange secured by OSCORE (Object Security for Constrained RESTful Environments), the pledge requests admission into the network, and the JRC configures it with link-layer keying material and other parameters. The JRC may at any time update the parameters through another request-response exchange secured by OSCORE. This specification defines the Constrained Join Protocol and its CBOR (Concise Binary Object Representation) data structures, and it describes how to configure the rest of the 6TiSCH communication stack for this join process to occur in a secure manner. Additional security mechanisms may be added on top of this minimal framework.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-05

IETF RFC 9032 Encapsulation of 6TiSCH Join and Enrollment Information Elements

 **URL:** <https://datatracker.ietf.org/doc/rfc9032/>

ABSTRACT: In the Time-Slotted Channel Hopping (TSCH) mode of IEEE Std 802.15.4, opportunities for broadcasts are limited to specific times and specific channels. Routers in a TSCH network transmit Enhanced Beacon (EB) frames to announce the presence of the network. This document provides a mechanism by which additional information critical for new nodes (pledges) and long-sleeping nodes may be carried within the EB in order to conserve use of broadcast opportunities.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2021-05

IETF RFC 9033 6TiSCH Minimal Scheduling Function (MSF)

URL: <https://datatracker.ietf.org/doc/rfc9033/>

ABSTRACT: This specification defines the "IPv6 over the TSCH mode of IEEE 802.15.4" (6TiSCH) Minimal Scheduling Function (MSF). This Scheduling Function describes both the behavior of a node when joining the network and how the communication schedule is managed in a distributed fashion. MSF is built upon the 6TiSCH Operation Sublayer Protocol (6P) and the minimal security framework for 6TiSCH.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2021-05

IETF RFC 9034 Packet Delivery Deadline Time in the Routing Header for IPv6 over Low-Power Wireless Personal Area Networks (6LoWPANs)

URL: <https://datatracker.ietf.org/doc/rfc9034/>

ABSTRACT: This document specifies a new type for the 6LoWPAN routing header containing the deadline time for data packets, designed for use over constrained networks. The deadline time enables forwarding and scheduling decisions for time-critical machine-to-machine (M2M) applications running on Internet-enabled devices that operate within time-synchronized networks. This document also specifies a representation for the deadline time values in such networks.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2021-06

IETF RFC 9035 A Routing Protocol for Low-Power and Lossy Networks (RPL) Destination-Oriented Directed Acyclic Graph (DODAG) Configuration Option for the 6LoWPAN Routing Header

URL: <https://datatracker.ietf.org/doc/rfc9035/>

ABSTRACT: This document updates RFC 8138 by defining a bit in the Routing Protocol for Low-Power and Lossy Networks (RPL) Destination-Oriented Directed Acyclic Graph (DODAG) Configuration option to indicate whether compression is used within the RPL Instance and to specify the behavior of nodes compliant with RFC 8138 when the bit is set and unset.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2021-04

IETF RFC 9037 Deterministic Networking (DetNet) Data Plane: MPLS over IEEE 802.1 Time-Sensitive Networking (TSN)

 **URL:** <https://datatracker.ietf.org/doc/rfc9037/>

ABSTRACT: This document specifies the Deterministic Networking (DetNet) MPLS data plane when operating over an IEEE 802.1 Time-Sensitive Networking (TSN) sub-network.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2021-06

IETF RFC 9039 Uniform Resource Names for Device Identifiers

 **URL:** <https://datatracker.ietf.org/doc/rfc9039/>

ABSTRACT: This document describes a new Uniform Resource Name (URN) namespace for hardware device identifiers. A general representation of device identity can be useful in many applications, such as in sensor data streams and storage or in equipment inventories. A URN-based representation can be passed along in applications that need the information.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-06

IETF RFC 9055 Deterministic Networking (DetNet) Security Considerations

 **URL:** <https://datatracker.ietf.org/doc/rfc9055/>

ABSTRACT: This document addresses DetNet-specific security considerations from the perspectives of both the DetNet system-level designer and component designer.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2021-06

IETF RFC 9056 Deterministic Networking (DetNet) Data Plane: IP over MPLS

 **URL:** <https://datatracker.ietf.org/doc/rfc9056/>

ABSTRACT: This document specifies the Deterministic Networking data plane when encapsulating IP over an MPLS packet-switched network.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-10

IETF RFC 9090 Concise Binary Object Representation (CBOR) Tags for Object Identifiers

 **URL:** <https://datatracker.ietf.org/doc/rfc9090/>

ABSTRACT: This document defines CBOR tags for object identifiers (OIDs) and is the reference document for the IANA registration of the CBOR tags so defined.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-07

IETF RFC 9023 Deterministic Networking (DetNet) Data Plane: IP over IEEE 802.1 Time-Sensitive Networking (TSN)

 **URL:** <https://datatracker.ietf.org/doc/rfc9023/>

ABSTRACT: This document specifies the Deterministic Networking IP data plane when operating over a Time-Sensitive Networking (TSN) sub-network.


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2021-06

IETF RFC 9159 IPv6 Mesh over BLUETOOTH(R) Low Energy Using the Internet Protocol Support Profile (IPSP)

 **URL:** <https://datatracker.ietf.org/doc/rfc9159/>

ABSTRACT: RFC 7668 describes the adaptation of IPv6 over Low-Power Wireless Personal Area Network (6LoWPAN) techniques to enable IPv6 over Bluetooth Low Energy (Bluetooth LE) networks that follow the star topology. However, recent Bluetooth specifications allow the formation of extended topologies as well. This document specifies mechanisms that are needed to enable IPv6 mesh over Bluetooth LE links established by using the Bluetooth Internet Protocol Support Profile (IPSP). This document does not specify the routing protocol to be used in an IPv6 mesh over Bluetooth LE links.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-12

IETF RFC4919 IPv6 over Low-Power Wireless Personal Area Networks (6LoWPANs): Overview, Assumptions, Problem Statement, and Goals

 **URL:** <https://datatracker.ietf.org/doc/rfc4919/>

ABSTRACT: This document describes the assumptions, problem statement, and goals for transmitting IP over IEEE 802.15.4 networks. The set of goals enumerated in this document form an initial set only.


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2007-08

IETF RFC4944 Transmission of IPv6 Packets over IEEE 802.15.4 Networks

 **URL:** <https://datatracker.ietf.org/doc/rfc4944/>

ABSTRACT: This document describes the frame format for transmission of IPv6 packets and the method of forming IPv6 link-local addresses and statelessly autoconfigured addresses on IEEE 802.15.4 networks. Additional specifications include a simple header compression scheme using shared context and provisions for packet delivery in IEEE 802.15.4 meshes.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2007-09

IETF RFC5548 Routing Requirements for Urban Low-Power and Lossy Networks

 **URL:** <https://datatracker.ietf.org/doc/rfc5548/>

ABSTRACT: This documents aims to specify a set of IPv6 routing requirements reflecting these and further U-LLNs' tailored characteristics.


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2009-05

IETF RFC6206 The Trickle Algorithm

 **URL:** <https://datatracker.ietf.org/doc/rfc6206/>

ABSTRACT: This document describes the Trickle algorithm and considerations in its use.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2011-03

IETF RFC6282 Compression Format for IPv6 Datagrams over IEEE 802.15.4-Based Networks

 **URL:** <https://datatracker.ietf.org/doc/rfc6282/>

ABSTRACT: This document updates RFC 4944, "Transmission of IPv6 Packets over IEEE 802.15.4 Networks". This document specifies an IPv6 header compression format for IPv6 packet delivery in Low Power Wireless Personal Area Networks (6LoWPANs). The compression format relies on shared context to allow compression of arbitrary prefixes. How the information is maintained in that shared context is out of scope. This document specifies compression of multicast addresses and a framework for compressing next headers. UDP header compression is specified within this framework.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2011-09

IETF RFC6550 RPL: IPv6 Routing Protocol for Low-Power and Lossy Networks

 **URL:** <https://datatracker.ietf.org/doc/rfc6550/>

ABSTRACT: This document specifies the IPv6 Routing Protocol for Low-Power and Lossy Networks (RPL), which provides a mechanism whereby multipoint-to-point traffic from devices inside the LLN towards a central control point as well as point-to-multipoint traffic from the central control point to the devices inside the LLN are supported. Support for point-to-point traffic is also available.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2012-03

IETF RFC6551 Routing Metrics Used for Path Calculation in Low-Power and Lossy Networks

 **URL:** <https://datatracker.ietf.org/doc/rfc6551/>

ABSTRACT: This document specifies a set of link and node routing metrics and constraints suitable to LLNs to be used by the Routing Protocol for Low-Power and Lossy Networks (RPL).


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2012-03

IETF RFC6552 Objective Function Zero for the Routing Protocol for Low-Power and Lossy Networks (RPL)

 **URL:** <https://datatracker.ietf.org/doc/rfc6552/>

ABSTRACT: This document specifies a basic Objective Function that relies only on the objects that are defined in the RPL and does not use any protocol extensions.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2012-03

IETF RFC6568 Design and Application Spaces for IPv6 over Low-Power Wireless Personal Area Networks (6LoWPANs)

 **URL:** <https://datatracker.ietf.org/doc/rfc6568/>

ABSTRACT: This document investigates potential application scenarios and use cases for low-power wireless personal area networks (LoWPANs). This document provides dimensions of design space for LoWPAN applications. A list of use cases and market domains that may benefit and motivate the work currently done in the 6LoWPAN Working Group is provided with the characteristics of each dimension. A complete list of practical use cases is not the goal of this document.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2012-04

IETF RFC6606 Problem Statement and Requirements for IPv6 over Low-Power Wireless Personal Area Network (6LoWPAN) Routing

 **URL:** <https://datatracker.ietf.org/doc/rfc6606/>

ABSTRACT: This document provides the problem statement and design space for 6LoWPAN routing. It defines the routing requirements for 6LoWPANs, considering the low-power and other particular characteristics of the devices and links. The purpose of this document is not to recommend specific solutions but to provide general, layer-agnostic guidelines about the design of 6LoWPAN routing that can lead to further analysis and protocol design.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2012-05

IETF RFC6690 Constrained RESTful Environments (CoRE) Link Format

 **URL:** <https://datatracker.ietf.org/doc/rfc6690/>

ABSTRACT: This specification defines Web Linking using a link format for use by constrained web servers to describe hosted resources, their attributes, and other relationships between links. Based on the HTTP Link Header field defined in RFC 5988, the Constrained RESTful Environments (CoRE) Link Format is carried as a payload and is assigned an Internet media type. “RESTful” refers to the Representational State Transfer (REST) architecture. A well-known URI is defined as a default entry point for requesting the links hosted by a server.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2012-08

IETF RFC6719 The Minimum Rank with Hysteresis Objective Function

 **URL:** <https://datatracker.ietf.org/doc/rfc6719/>

ABSTRACT: This specification describes the Minimum Rank with Hysteresis Objective Function (MRHOF), an Objective Function that selects routes that minimize a metric, while using hysteresis to reduce churn in response to small metric changes. MRHOF works with additive metrics along a route, and the metrics it uses are determined by the metrics that the RPL Destination Information Object (DIO) messages advertise.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2012-09

IETF RFC6775 Neighbor Discovery Optimization for IPv6 over Low-Power Wireless Personal Area Networks (6LoWPANs)

 **URL:** <https://datatracker.ietf.org/doc/rfc6775/>

ABSTRACT: The IETF work in IPv6 over Low-power Wireless Personal Area Network (6LoWPAN) defines 6LoWPANs such as IEEE 802.15.4. This and other similar link technologies have limited or no usage of multicast signaling due to energy conservation. In addition, the wireless network may not strictly follow the traditional concept of IP subnets and IP links. IPv6 Neighbor Discovery was not designed for non transitive wireless links, as its reliance on the traditional IPv6 link concept and its heavy use of multicast make it inefficient and sometimes impractical in a low-power and lossy network. This document describes simple optimizations to IPv6 Neighbor Discovery, its addressing mechanisms, and duplicate address detection for Low-power Wireless Personal Area Networks and similar networks. The document thus updates RFC 4944 to specify the use of the optimizations defined here.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2012-11

IETF RFC6997 Reactive Discovery of Point-to-Point Routes in Low-Power and Lossy Networks

 **URL:** <https://datatracker.ietf.org/doc/rfc6997/>

ABSTRACT: This document specifies a point-to-point route discovery mechanism, complementary to the Routing Protocol for Low-power and Lossy Networks (RPL) core functionality. This mechanism allows an IPv6 router to discover “on demand” routes to one or more IPv6 routers in a Low-power and Lossy Network (LLN) such that the discovered routes meet specified metrics constraints.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2013-08

IETF RFC6998 A Mechanism to Measure the Routing Metrics along a Point-to-Point Route in a Low-Power and Lossy Network

URL: <https://datatracker.ietf.org/doc/rfc6998/>

ABSTRACT: This document specifies a mechanism that enables a Routing Protocol for Low-power and Lossy Networks (RPL) router to measure the aggregated values of given routing metrics along an existing route towards another RPL router, thereby allowing the router to decide if it wants to initiate the discovery of a better route.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2013-08

IETF RFC7252 The Constrained Application Protocol (CoAP)

URL: <https://datatracker.ietf.org/doc/rfc7252/>

ABSTRACT: The Constrained Application Protocol (CoAP) is a specialized web transfer protocol for use with constrained nodes and constrained (e.g., low-power, lossy) networks. The nodes often have 8-bit microcontrollers with small amounts of ROM and RAM, while constrained networks such as IPv6 over Low-Power Wireless Personal Area Networks (6LoWPANs) often have high packet error rates and a typical throughput of 10s of kbit/s. The protocol is designed for machine-to-machine (M2M) applications such as smart energy and building automation.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2014-06

IETF RFC7390 Group Communication for the Constrained Application Protocol (CoAP)

URL: <https://datatracker.ietf.org/doc/rfc7390/>

ABSTRACT: This specification defines how CoAP should be used in a group communication context. An approach for using CoAP on top of IP multicast is detailed based on existing CoAP functionality as well as new features introduced in this specification. Also, various use cases and corresponding protocol flows are provided to illustrate important concepts. Finally, guidance is provided for deployment in various network topologies.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2014-10

IETF RFC9009 Efficient Route Invalidation

URL: <https://datatracker.ietf.org/doc/rfc9009/>

ABSTRACT: This document explains the problems associated with the use of No-Path Destination Advertisement Object (NPDAO) messaging in RFC 6550 and also discusses the requirements for an optimized route invalidation messaging scheme. Further, this document specifies a new proactive route invalidation message called the "Destination Cleanup Object" (DCO), which fulfills requirements for optimized route invalidation messaging.

DOCUMENT TYPE: Standard_Specification


PUBLICATION DATE: 2021-04

Report of TWG-IIoT & EDGE: **Landscape of Internet of Things (IoT) Standards**

IETF RFC9010 Routing for RPL (Routing Protocol for Low-Power and Lossy Networks) Leaves

 **URL:** <https://datatracker.ietf.org/doc/rfc9010/>

ABSTRACT: This specification provides a mechanism for a host that implements a routing-agnostic interface based on IPv6 over Low-Power Wireless Personal Area Network (6LoWPAN) Neighbor Discovery to obtain reachability services across a network that leverages RFC 6550 for its routing operations. It updates RFCs 6550, 6775, and 8505.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-04

IRTF draft-irtf-t2trg-rest-iot Guidance on RESTful Design for Internet of Things Systems

 **URL:** <https://datatracker.ietf.org/doc/draft-irtf-t2trg-rest-iot/>

ABSTRACT: This document gives guidance for designing Internet of Things (IoT) systems that follow the principles of the Representational State Transfer (REST) architectural style. This document is a product of the IRTF Thing-to-Thing Research Group (T2TRG).

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-02

IRTF RFC 8691 Basic Support for IPv6 Networks Operating Outside the Context of a Basic Service Set over IEEE Std 802.11

 **URL:** <https://datatracker.ietf.org/doc/rfc8691/>

ABSTRACT: This document provides methods and settings for using IPv6 to communicate among nodes within range of one another over a single IEEE 802.11-OCB link.


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2019-12

ISO/IEC 20005:2013 Information technology - Sensor networks - Services and interfaces supporting collaborative information processing in intelligent sensor networks

 **URL:** <https://www.iso.org/standard/50952.html?browse=tc>

ABSTRACT: ISO/IEC 20005:2013 specifies services and interfaces supporting collaborative information processing (CIP) in intelligent sensor networks which includes: (1) CIP functionalities and CIP functional model, (2) common services supporting CIP, (3) common service interfaces to CIP.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2013-07

ITU-T G.9959 Short range narrow-band digital radiocommunication transceivers - PHY, MAC, SAR and LLC layer specifications

 **URL:** <https://www.itu.int/rec/T-REC-G.9959-201501-l/en>

ABSTRACT: Recommendation ITU-T G.9959 specifies the physical (PHY), medium access control (MAC), segmentation and reassembly (SAR), and logical link control (LLC) layers for short range narrow-band digital radiocommunication transceivers (TRXs). This Recommendation contains the non-radio (frequency) related aspects of the radiocommunication TRX. Sub 1 GHz TRXs claiming compliance with this specification shall also comply with Annex A of this Recommendation.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-01

ITU-T Q.4060 (10/2018) The structure of the testing of heterogeneous Internet of things gateways in a laboratory environment

 **URL:** <https://handle.itu.int/11.1002/1000/13700>

ABSTRACT: This recommendation describes the testing methodology of the heterogeneous network gateway, which is to be used for communication among IoT devices. The tests will include the following, but not limited to: a) checking the gateway to verify stress load (benchmarking); b) checking the gateway to determine the possibility for the transmission of various types and sizes of frames and (or) packages; c) verifying joint conversions from different protocols and multiple interfaces; d) checking the gateway operation settings (CPU, RAM, etc.); and e) checking the network parameters (delay, data loss, etc.).


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-10

ITU-T Y.4117 (10/2017) Requirements and capabilities of Internet of Things for support of wearable devices and related services

 **URL:** <https://handle.itu.int/11.1002/1000/13386>

ABSTRACT: The scope of this recommendation includes: a) description of characteristics of WD and WDS; b) specific requirements of the IoT for support of WD and WDS; c) specific capabilities of the IoT for support of WD and WDS; d) Information concerning use cases for WD and WDS.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-10

ITU-T Y.4411/Q.3052 (02/2016) Overview of application programming interfaces and protocols for M2M service layer

 **URL:** <https://handle.itu.int/11.1002/1000/12698>

ABSTRACT: This recommendation provides an overview of APIs and protocols for the M2M service layer and the related API and protocol requirements. It describes the component based M2M reference model, including the reference points of the M2M service layer. Then, APIs and protocols for M2M are introduced, including existing APIs and protocols for M2M service layer and M2M protocol structure and stacks. Finally, API and protocol requirements with respect to the M2M service layer are analysed.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-02

ITU-T Y.4418 (06/2018) Functional architecture of gateway for Internet of things applications

 **URL:** <https://handle.itu.int/11.1002/1000/13640>

ABSTRACT: This recommendation provides the gateway functional architecture for Internet of things (IoT) applications. The scope of this recommendation also includes: a) the gateway functional entities for IoT applications; b) the gateway reference points for IoT applications; c) typical logical flows.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-06

ITU-T Y.4451 (09/2016) Framework of constrained node networking in the IoT environments

 **URL:** <https://handle.itu.int/11.1002/1000/13026>

ABSTRACT: The scope of this recommendation includes the following items: a) An overview of constrained node device networking in the IoT environments; b) Communication of constrained node devices; c) Architectures of constrained node device networking; d) Functionalities of constrained node device networking.

 **DOCUMENT TYPE:** Framework

 **PUBLICATION DATE:** 2016-09

LAAS-CNRS Node-Red IDE-OM2M Node-Red IDE-OM2M V1.0.2: A framework for the rapid development of IoT applications using the OM2M platform through Node-RED

 **URL:** <https://www.npmjs.com/package/node-red-contrib-ide-iot>

ABSTRACT: The Internet of Things (IoT) has emerged strongly in recent years thanks to the proliferation of wireless communication devices and networks. It has spawned an explosion of new uses and services such as supply chain management, property and person monitoring, residential or business home automation, etc. However, several challenges must be overcome in order to develop IoT applications such as interoperability and interaction with and between different connected objects. In this paper, we propose a high-level Integrated Development Environment (IDE) that provides end-to-end solution for writing and deploying IoT applications. This IDE uses the Node-RED graphical environment to interact with the OM2M standard which serves as a middle-ware between our Node-RED module and the various heterogeneous devices. It also offers semantic support for an intuitive interaction with these devices.


 **DOCUMENT TYPE:** Open_Source


 **PUBLICATION DATE:** 2018-08

NGI-Ontochain ADOS (AirTrace Decentralized Oracle System)


 **URL:** <https://ontochain.ngi.eu/content/ados>

ABSTRACT: An advanced AI-based oracle system for securing off-chain IoT data integrity when injecting in the blockchain ADOS offers the chance to B-IoT (Blockchain of IoT) practitioners to track and quantify data integrity before and after injecting into the Blockchain. This new dimension greatly improves reliability in the IoT data auditing process.

 **DOCUMENT TYPE:** EU & National funded Open Source projects

 **PUBLICATION DATE:** Under develop-ment

OASIS Advanced Message Queuing Protocol (AMQP) TC


 **URL:** https://www.oasis-open.org/committees/tc_home.php?wg_abbrev=amqp

ABSTRACT: The OASIS AMQP TC advances a vendor-neutral and platform-agnostic protocol that offers organizations an easier, more secure approach to passing real-time data streams and business transactions. The goal of AMQP is to ensure information is safely and efficiently transported between applications, among organizations, across distributed cloud computing environments, and within mobile infrastructures. AMQP avoids proprietary technologies, offering the potential to lower the cost of enterprise middleware software integrations through open interoperability. By enabling a commoditized, multi-vendor ecosystem, AMQP seeks to create opportunities for transforming the way business is done in the Cloud and over the Internet.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** N/A

OASIS OASIS Message Queuing Telemetry Transport (MQTT) TC

 **URL:** https://www.oasis-open.org/committees/tc_home.php?wg_abbrev=mqtt

ABSTRACT: The OASIS MQTT TC is producing a standard for the Message Queuing Telemetry Transport Protocol compatible with MQTT V3.1, together with requirements for enhancements, documented usage examples, best practices, and guidance for use of MQTT topics with commonly available registry and discovery mechanisms. The standard supports bi-directional messaging to uniformly handle both signals and commands, deterministic message delivery, basic QoS levels, always/sometimes-connected scenarios, loose coupling, and scalability to support large numbers of devices. Candidates for enhancements include message priority and expiry, message payload typing, request/reply, and subscription expiry.


As an M2M/Internet of Things (IoT) connectivity protocol, MQTT is designed to support messaging transport from remote locations/devices involving small code footprints (e.g., 8-bit, 256KB ram controllers), low power, low bandwidth, high-cost connections, high latency, variable availability, and negotiated delivery guarantees. For example, MQTT is being used in sensors communicating to a broker via satellite links, SCADA, over occasional dial-up connections with healthcare providers (medical devices), and in a range of home automation and small device scenarios. MQTT is also ideal for mobile applications because of its small size, minimized data packets, and efficient distribution of information to one or many receivers (subscribers).

For more information on the MQTT TC, see the TC Charter.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** N/A

OMA-TS-REST_NetAPI_DeviceCapabilities-V1_0_1-20151123-A RESTful Network API for Device Capabilities


 **URL:** https://www.openmobilealliance.org/release/DevCapREST/V1_0_1-20151123-A/OMA-TS-REST_NetAPI_DeviceCapabilities-V1_0_1-20151123-A.pdf

ABSTRACT: This specification defines a RESTful Device Capabilities API using an HTTP protocol binding, based on the similar API defined in 3GPP TS 29.199-18.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2015-11

oneM2M ETSI TR 118 524 V2.0.0 3GPP Release 13 Interworking

 **URL:** https://www.etsi.org/deliver/etsi_tr/118500_118599/118524/02.00.00_60/tr_118524v020000p.pdf

ABSTRACT: The present document is a study of interworking between oneM2M Architecture and 3GPP Rel-13 architecture for Service Capability Exposure as defined in the release 13 version of ETSI TS 123 682. The key objective and value is analyzed and described. The document also investigates the potential solution in oneM2M by evaluating the existing technical solutions.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2016-09

oneM2M TS-0009-V4.4.0 HTTP Protocol Binding


 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34550>

ABSTRACT: HTTP Protocol Binding TS.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-02

oneM2M TS-0020-V2.0.0 WebSocket Protocol Binding (oneM2M TS-0020 version 2.0.0 Release 2)

 **URL:** https://onem2m.org/images/files/deliverables/Release2/TS-0020_WebSocket_Protocol_Binding_V2_0_0.pdf

ABSTRACT: The present document specifies the binding of Mca and Mcc primitives onto the WebSocket binding. It specifies: a) Procedures and message formats for operating and closing of WebSocket connections; b) How request and response primitives are mapped into the payload of the WebSocket protocol.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2016-09-01

oneM2M-TR-0064 ZigBee Interworking

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=32243>

ABSTRACT: This technical report investigates oneM2M and ZigBee interworking scenarios and proposes possible solutions to support the interworking scenarios.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2020-04

RIOT RIOT OS The friendly Operating System for the Internet of Things

 **URL:** <https://www.riot-os.org/>

ABSTRACT: RIOT powers the Internet of Things like Linux powers the Internet. RIOT is a free, open source operating system developed by a grassroots community gathering companies, academia, and hobbyists, distributed all around the world.

DOCUMENT TYPE: Framework

PUBLICATION DATE: 2014-05

Manufacturing

IETF RFC5673 Industrial Routing Requirements in Low-Power and Lossy Networks

URL: <https://datatracker.ietf.org/doc/rfc5673/>

ABSTRACT: The wide deployment of lower-cost wireless devices will significantly improve the productivity and safety of industrial plants while increasing the efficiency of plant workers by extending the information set available about the plant operations. The aim of this document is to analyze the functional requirements for a routing protocol used in industrial Low-power and Lossy Networks (LLNs) of field devices.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2009-10

Mobility

CEN EN ISO 14814:2006 Road transport and traffic telematics - Automatic vehicle and equipment identification - Reference architecture and terminology (ISO 14814:2006)

URL: https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:21173&cs=184DD778D0F4ED9BEEC2F72C92F3FFFB1

ABSTRACT: ISO 14814:2006 establishes a common framework to achieve unambiguous identification in ITS/RTTT (Intelligent Transport Systems/Road Transport and Traffic Telematics) AVI/AEI (Automatic Vehicle Identification/Automatic Equipment Identification) applications. This scheme and Reference Architecture Model is designed to be an “enabling” structure to allow interoperability between different commercial systems, and not prescriptive in determining any one system. It is not frequency- nor air interface protocol-specific, provides maximum interoperability, has a high population capability, and provides the possibility of upwards migration to more capable systems. ISO 14814:2006 provides a reference structure which enables an unambiguous identification and also identifies the data construct as an ITS/RTTT message. The construct also identifies which ITS/RTTT data structure is contained in the message.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2006-03

CEN prEN 13757-8 Communication systems for meters - Part 8: Adaptation layer

URL: https://standards.cencenelec.eu/dyn/www/f?p=CEN:110:0:::FSP_PROJECT,FSP_ORG_ID:73097,6275&cs=1CE9310EF9BBD64EFF17A11F17C70CBD7

ABSTRACT: This document describes the functionalities and specifies the requirements of an Adaptation Layer to be applied when transporting M-Bus upper layers using a wireless communication protocol other than Wireless M-Bus. These alternative radio technologies developed outside CEN/TC

294 could be based on Internet Protocol or not and operate either in licensed or unlicensed frequency bands.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: Under development

IEEE 802.11p amendment for wireless access in vehicular environments (WAVE)

🔗 URL: <https://ieeexplore.ieee.org/document/5514475>

ABSTRACT: Communications/Networking - DSRC is a U.S. Department of Transportation (DOT) project based on ISO's Communications Access for Land Mobiles (CALM) architecture for vehicle-based communication networks, particularly for applications such as toll collection, vehicle safety services, and commerce transactions via cars.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2010-07

IETF draft-ietf-ipwave-vehicular-networking IPv6 Wireless Access in Vehicular Environments (IPWAVE): Problem Statement and Use Cases

🔗 URL: <https://datatracker.ietf.org/doc/draft-ietf-ipwave-vehicular-networking/>

ABSTRACT: This document discusses the problem statement and use cases of IPv6-based vehicular networking for Intelligent Transportation systems (ITS).

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2022-03

ITU-T H.560 (12/2017) Communications interface between external applications and a Vehicle Gateway Platform

🔗 URL: <https://handle.itu.int/11.1002/1000/13435>

ABSTRACT: This recommendation defines the requirements for vehicle gateway platform (VGP) services, VGP service functionalities and VGP management. The VGP service functions support service capabilities for applications running and data/message processing. The VGP service functionalities support core capabilities used by VGP services such as session management or in-vehicle resource access management. Finally, the VGP management supports functions for VGP configuration and monitoring such as security management.

This Recommendation also defines the network requirements for communication interfaces used between the defined VGP services and external applications. These external applications could be running over nomadic devices brought into the vehicle, roadside infrastructure, or cloud-based servers. Applications downloaded to one of the in-vehicle devices after the time of manufacture are also considered external applications since they may not be fully integrated into the driver-vehicle interface (DVI) and require a communications interface.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2017-12

SAE 6857 Requirements for a Terrestrial Based Positioning, Navigation, and Timing (PNT) System to Improve Navigation Solutions and Ensure Critical Infrastructure Security

 **URL:** <https://www.sae.org/standards/content/sae6857/>

ABSTRACT: This Recommended Practice defines the technical requirements for a terrestrial-based PNT system to improve vehicle (e.g., unmanned, aerial, ground, maritime) positioning/navigation solutions and ensure critical infrastructure security, complementing Global Navigation Satellite System (GNSS) technologies.


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2018-04

SAE J2735 ASN1 V2X Communications Message Set Dictionary™ ASN file

 **URL:** https://www.sae.org/standards/content/j2735asn_202007/

ABSTRACT: This Abstract Syntax Notation (ASN.1) File is the precise source code used for SAE International Standard J2735. As part of an international treaty, all US ITS standards are expressed in “ASN.1 syntax”. ASN.1 Syntax is used to define the messages or “ASN specifications”. Using the ASN.1 specification, a compiler tool produces the ASN library which will then be used to produce encodings (The J2735 message set uses UPER encoding). The library is a set of many separate files that collectively implement the encoding and decoding of the standard. The library is then used by any application (along with the additional logic of that application) to manage the messages. The chosen ASN tool is used to produce a new copy of the library when changes are made, and it is then linked to the final application being developed. The ASN library manages many of the details associated with ASN syntax, allowing for subtle manipulation to make the best advantage of the encoding style.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-07

SAE J2735 V2X Communications Message Set Dictionary

 **URL:** https://www.sae.org/standards/content/j2735_202007/

ABSTRACT: This SAE standard specifies a message set, and its data frames and data elements, for use by applications that use vehicle-to-everything (V2X) communications systems. While the data dictionary was originally designed for use over DSRC, this document is intended to be independent of the underlying communications protocols used to exchange data between participants in V2X applications.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-07

SAE J2945 Guidance Dedicated Short-Range Communication (DSRC) Systems Engineering Process Guidance for SAE J2945/X Documents and Common Design Concepts™

 **URL:** https://www.sae.org/standards/content/j2945_201712/

ABSTRACT: This SAE Standard serves as the guidance document for the J2945/x family of standards. It contains cross-cutting material which applies to the other J2945/x standards, including recommended practice for the use of Systems Engineering (SE) and generic DSRC interface requirements content. The scope for the DSRC system environment is to provide for the information exchange between a

host vehicle and another DSRC enabled device, a device worn by or otherwise attached to a traveller, a roadside device, or a management centre, to address safety, mobility, and environmental system needs.

The audience for this document includes the technical teams of developers of the J2945/x documents and the implementers of the applications which are based on the J2945/x documents.

🔗 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2017-12

SAE J2945/2 Dedicated Short-Range Communications (DSRC) Performance Requirements for V2V Safety Awareness

🔗 URL: https://www.sae.org/standards/content/j2945/2_201810/

ABSTRACT: This SAE Document specifies DSRC interface requirements for V2V Safety Awareness applications, including detailed Systems Engineering documentation (needs and requirements mapped to appropriate message exchanges). These applications include: Emergency Vehicle Alert, Roadside Alert, and Safety Awareness Alerts for Objects and Adverse Road Conditions. This document extends the V2V Communications capabilities defined in J2945/1 to support these applications, and the National ITS Architecture.

The purpose of this SAE Document is to enable interoperability for V2V Safety Awareness communications.

🔗 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2018-10

■ Water

ISO/IEC 30177 ED1 Internet of Things (IoT) - Underwater network management system (U-NMS) interworking

🔗 URL: https://www.iec.ch/dyn/www/f?p=103:38:204774363295796:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:20486,23,104960

ABSTRACT: This document specifies the detailed description on interworking components in underwater network management system (U-NMS). It provides the intra-working of U-NMS components, interworking between U-NMS's terrestrial domain components and U-NMS's surface domain components, interworking between U-NMS's surface domain components and U-NMS's underwater domain components, and interworking in U-NMS's underwater domain components.

🔗 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: Under develop-ment


■ Data and Architecture

■ Energy

CENELEC EN 50090 (ISO 14543) Home and Building Electronic Systems (HBES)

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=CENELEC:110:::::FSP_PROJECT,FSP_ORG_ID:55668,1258281&cs=14BD408738BD97FB5CF4581F27FF76877

ABSTRACT: System Architecture, Communications/Networking, Data and Information Management - KNX is an open standard (see EN 50090, ISO/IEC 14543) for commercial and domestic building automation. KNX evolved from three earlier standards: the European Home Systems Protocol (EHS), BatiBUS, and the European Installation Bus (EIB or Instabus). On this network, the devices form distributed applications and tight interaction is possible. This is implemented via interworking models with standardized datapoint types and objects, modelling logical device channels.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2012-02

EEBUS SHIP (Smart Home IP) and SPINE (Smart Premises Interoperable Neutral Message Exchange)

 **URL:** www.eebus.org/media-downloads/#specifications

ABSTRACT: System Architecture, Communications/Networking, Data and Information Management - EEBUS specifies the language of energy using the SHIP, SPINE and Use Case specifications. Bosch Software Innovations and KEO Connectivity provide a simple implementation of the EEBUS interface via their software products for EEBUS integration.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** N/A

Energetics ETP v1.2 Energetics Transfer Protocol (ETP) v1.2 (2021)


 **URL:** <https://www.energetics.org/energetics-releases-v1-2-of-energetics-transfer-protocol/>

ABSTRACT: Data and Information Management - The ETP data exchange specification enables efficient transfer of data between applications. The initial use case is for real-time data; however, it is anticipated that ETP will be expanded to include functionality for historical data queries. ETP has been specifically envisioned and designed to meet the unique needs of the upstream oil and gas industry and especially to facilitate the exchange of data across the Energetics family of data standards, which includes WITSML, PRODML and RESQML.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-09

ETSI TS 103 410-1 SmartM2M; Extension to SAREF; Part 1: Energy Domain

 **URL:** http://www.etsi.org/deliver/etsi_ts/103400_103499/10341001/01.01.02_60/ts_10341001v010102p.pdf

ABSTRACT: This work extends the Smart Appliances reference ontology as defined in TS 103 264. The objective is to include input from the energy domain actors. This specification is defined as an extension of TS 103 264.

Note: The TS 103 410 set of standards covers the following domains:

1. TS 103 410-1 - Extension to SAREF; Part 1: Energy Domain,
2. TS 103 410-2 - Extension to SAREF; Part 2: Environment Domain,
3. TS 103 410-3 - Extension to SAREF; Part 3: Building Domain,
4. TS 103 410-4 - Extension to SAREF; Part 4: Smart Cities Domain,
5. TS 103 410-5 - Extension to SAREF; Part 5: Industry and Manufacturing Domains,
6. TS 103 410-6 - Extension to SAREF; Part 6: Smart Agriculture and Food Chain Domain,
7. TS 103 410-7 - Extension to SAREF; Part 7: Automotive Domain,
8. TS 103 410-8 - Extension to SAREF; Part 8: eHealth/Ageing-well Domain,
9. TS 103 410-9 - Extension to SAREF; Part 9: Wearables Domain,
10. TS 103 410-10 - Extension to SAREF; Part 10: Water Domain,
11. TS 103 410-11 - Extension to SAREF; Part 11: Lift Domain.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-05

ISO/IEC TR 30148:2019 Internet of things (IoT) - Application of sensor network for wireless gas meters

 **URL:** <https://webstore.iec.ch/publication/63562>

ABSTRACT: ISO/IEC TR 30148:2019 (E) describes: a) the structure of wireless gas meter networks, and b) the application protocol of wireless gas meter networks.

 **DOCUMENT TYPE:** Technical_Report


 **PUBLICATION DATE:** 2019-10

■ Food_and_Agriculture

ITU-T Y.4466 (01/2020) Framework of smart greenhouse service

 **URL:** <https://handle.itu.int/11.1002/1000/14169>

ABSTRACT: This recommendation describes the reference architecture for the smart greenhouse service which provides and maintains optimal conditions for growing crops in greenhouse environment. The scope covered by the framework of smart greenhouse service includes the following issues: a) Overview of the smart greenhouse service; b) Reference architecture for smart greenhouse service; c) Interfaces for smart greenhouse service; d) Use Cases of smart greenhouse service.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-01


Health

ISO/IEEE 11073 (2014) Health informatics – Point-of-care medical device communication.

 **URL:** <https://www.iso.org/standard/77338.html>


ABSTRACT: System Architecture - Personal Health Device (PHD) standards are a group of standards addressing the interoperability of personal health devices (PHDs) such as weighing scales, blood pressure monitors, blood glucose monitors and the like.

1. ISO/IEEE 11073 is a multi-part standard whose core, non-device-specific elements include, among others:
2. ISO/IEEE 11073-00103:2012 (Overview),
3. ISO/IEEE 11073-10101:2004 (Nomenclature),
4. ISO/IEEE 11073-10201:2018 (Domain information model),
5. ISO/IEEE 11073-10206 (Abstract information content model),
6. ISO/IEEE 11073-20101:2004 (Application Profile – Base Standard),
7. ISO/IEEE 11073-20601:2010 (Application profile – Optimized exchange protocol),
8. ISO/IEEE 11073-20702:2016 (Medical Devices Communication Profile for Web Services).

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-08

ISO/IEC 30180 ED1 Internet of Things (IoT) - Functional requirements to determine the status of self-quarantine through Internet of Things data interfaces

 **URL:** https://www.iec.ch/dyn/www/f?p=103:38:204774363295796:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:20486,23,106630

ABSTRACT: This document specifies the functional requirements about the following items to figure out the status of self-quarantine through IoT data interfaces working over a set of hand-held devices, wristbands, and a management system: (1) Functional requirements for self-quarantine app and optional wristband at a self-quarantine place; (2) Functional requirements for self-quarantine management app and system at the management side; and (3) Functional requirements for the protection of the self-quarantine status and the privacy information.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under development

ITU-T Y.4908 (12/2020) Performance evaluation frameworks of e-health systems in the Internet of things

 **URL:** <https://handle.itu.int/11.1002/1000/14425>

ABSTRACT: This recommendation specifies performance evaluation frameworks of e-health systems in the IoT for e-health services. From information and communication technologies point of view, e-health services are classified. Performance evaluation factors applicable for e-health systems in the IoT are specified. Then performance evaluation frameworks are normalized for the classified e-health services. The scope of this recommendation includes: a) Classification of e-health services; b) Performance evaluation factors applicable for e-health systems in the IoT; c) Key performance frameworks.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-12

■ Horizontals & Verticals

AIOTI Computing Continuum Scenarios, Requirements and Optical Communication enablers


 **URL:** <https://aioti.eu/wp-content/uploads/2022/04/AIOTI-Computing-Continuum-Final.pdf>

ABSTRACT: This report introduces Computing Continuum use cases, requirements and KPIs on communication infrastructures, IoT and edge computing platforms. Compared to many current activities the computing continuum enables a more flexible allocation of compute and communication resources and workload placement. Many novel applications require rather stringent KPIs since IoT is more and more mission critical. The new system requirements include strong security, very high bandwidth, very low delay, and very high reliability. Depending on the use case and deployment scenario, various technology enablers are currently under standardization, including the F5G optical network architecture, novel approaches to compute, and securing networking and compute.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-04

AIOTI High Priority IoT Standardisation Gaps and Relevant SDOs Release 2.0


 **URL:** <https://aioti.eu/wp-content/uploads/2020/01/AIOTI-WG3-High-Priority-Gaps-v2.0-200128-Final.pdf>

ABSTRACT: This report introduces an approach for the definition and identification of key gaps in several initiatives. Based on the prioritisation of these gaps, the deliverable starts to address the work done within the relevant SDOs that need to cooperate in order to solve these gaps. The purpose of this document is to reflect a structured discussion within the AIOTI WG standardisation community and to provide consolidated technical elements as well as guidance and recommendations. The revision of this report has been started in October 2018. The objective of the present Version 2.0 is to continue the study of resolution of High Priority IoT Standardisation Gaps by relevant SDOs (main focus) and insert new gaps in the table when relevant contributions are approved by the AIOTI WG standardisation group.


 **DOCUMENT TYPE:** Gap analysis

 **PUBLICATION DATE:** 2020-01

AIOTI IoT and Edge Computing impact on Beyond 5G: enabling technologies and challenges

 **URL:** <https://aioti.eu/wp-content/uploads/2021/10/AIOTI-Beyond-5G-R1-Report-Published.pdf>

ABSTRACT: This report highlights several IoT vertical domain use cases collected by AIOTI and determines the specific requirements they impose on the underlying (Beyond) 5G network infrastructure. These use cases and requirements can be used by Standards Developing Organizations (SDOs), such as 3GPP, ITU-T, ISO, and IEEE as requirements for automation in vertical domains focusing on critical communications. In addition to these use cases also emerging topics in the area of (Beyond) 5G technology are as well introduced.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2021-09

AIOTI IoT High-Level Architecture (HLA) Release 5.0


 **URL:** https://aioti.eu/wp-content/uploads/2020/12/AIOTI_HLA_R5_201221_Published.pdf

ABSTRACT: In the context of the AIOTI WG Standardisation and by following the evolution on IoT Architectural aspects and available specifications, AIOTI WG Standardisation has developed a High Level Architecture (HLA) for IoT that should be applicable to AIOTI Large Scale Pilots. The HLA takes into account existing SDOs and alliances architecture specifications. This document is an integral part of a set of deliverables from AIOTI WG Standardisation that also cover other aspects such as IoT landscape and Semantic Interoperability. AIOTI WG Standardisation recommends that the HLA be the basis for further discussion with the Large Scale Pilot(LSP) and AIOTI WGs in order to promote architectural convergence with SDOs, alliances, consortia and other relevant parties.

 **DOCUMENT TYPE:** Framework

 **PUBLICATION DATE:** 2020-12

AIOTI IoT LSP Standard Framework Concepts Release 2.9


 **URL:** <https://aioti.eu/wp-content/uploads/2019/10/AIOTI-WG3-SDOs-Alliance-Landscape-IoT-LSP-standrad-framework-R2.9-Published.pdf>

ABSTRACT: This deliverable introduces IoT Standards Developing Organisations' (SDOs), Alliances' and Open Source Software (OSS) landscapes to be used as input for the recommendations for Large Scale Pilots (LSPs) standard framework and gap analysis. The LSPs can play an important role in investigating and solving specific challenges for the IoT industry and promoting innovation that is related to specific activities such as 1) the applied standards framework, 2) deployments, 3) technological and business model validation and 4) acceptability. The main objective of this deliverable is to briefly present the global dynamics and landscapes of IoT SDO, Alliance and OSS initiatives, which can be used: 1) to leverage on existing IoT standardization, industry promotion and implementation of standards and protocols, 2) as input for LSP standards framework and gap analysis and 3) to provide a guideline for the proponents of future project proposals associated with future IoT related calls financed by the EC on the positioning of these initiatives within these landscapes.

 **DOCUMENT TYPE:** Landscape

 **PUBLICATION DATE:** 2019-10

AIOTI Ontology Landscape


 **URL:** <https://aioti.eu/wp-content/uploads/2022/02/AIOTI-Ontology-Landscape-Report-R1-Published-1.0.1.pdf>

ABSTRACT: Choosing the right ontologies is an important basis for successfully implementing semantic systems and achieving semantic interoperability between the systems. To make the choice of ontologies easier, the Semantic Interoperability Expert Group of the Alliance for Internet of Things Innovation (AIOTI) Working Group on Standardization has created an Ontology Landscape that currently includes 30 ontologies from different application areas of IoT. Apart from the application domain, the landscape visualizes how the ontology is maintained (by the colour used: single maintainer, organization, group of organizations/industry association or standardization organization).

 **DOCUMENT TYPE:** Landscape

 **PUBLICATION DATE:** 2021-12

AIOTI Semantic IoT Solutions - A Developer Perspective

 **URL:** https://www.researchgate.net/publication/336679022_Semantic_IoT_Solutions_-_A_Developer_Perspective

ABSTRACT: This paper is co-authored by an informal group of experts from a broad range of backgrounds, all of whom are active in standards groups, consortia, alliances and/or research projects in the Internet of Things (IoT) space. The idea is to show how IoT systems can be built using semantic technologies, enabling semantic interoperability and thus allowing applications to reuse information originally provided for a specific application or IoT domain. The primary target audience is IoT developers that do not have a previous background in semantic technologies. The paper describes the different tasks and activities required when building semantic systems. The goal is to enable developers to build systems utilizing semantic technologies. It can be seen as one building block to achieve semantic interoperability in IoT and thus create the basis for a true Internet of Things.

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** 2019-10

AIOTI Towards semantic interoperability standards based on ontologies

 **URL:** https://www.researchgate.net/publication/336677616_Towards_Semantic_Interoperability_Standards_based_on_Ontologies

ABSTRACT: This paper is co-authored by an informal group of experts from a broad range of backgrounds, all of whom are active in standards groups, consortia, alliances and/or research projects in the Internet of Things (IoT) space. This paper has two objectives: 1) explain the need for semantic interoperability, 2) provide recommendations for semantic interoperability standards using ontologies. The target audience for this paper is a) IoT system product owners who need to understand how they can effectively ensure interoperability of their products; b) IoT system and standardization engineers without background in semantic technologies.

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** 2019-10

bioTope D2.7 V2.0 bloTope SoS Reference Platform Specification


 **URL:** <https://storage.ning.com/topology/rest/1.0/file/get/35619929?profile=original>

ABSTRACT: This document provides the technical specifications of the bloTope SoS platform for IoT. A standard modelling language (UML) will be used to create and formalize the technical specifications, while considering key IoT reference architectures such as IoT-A (e.g., the IM and DM models).

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2018-03

CEN Wireless mesh networking - Communication systems for meter data exchange

 **URL:** <https://standards.iteh.ai/catalog/tc/cen/a0640f96-2f0c-4456-af8e-20887cd8b203/cen-tc-294-wg-6>

ABSTRACT: Produce and maintain standards for meter data exchange protocols, for use over short range wireless networks with meshing functionality. Note: Work will be based on existing ZigBee specifications.

DOCUMENT TYPE: Database

PUBLICATION DATE: N/A

ETSI DTR/MTS-TSTIIISec_IoTconf Methods for Testing and Specification (MTS); Security validation of IoT architecture application and conformity Case Study Experiences

URL: https://portal.etsi.org/webapp/WorkProgram/Report_WorkItem.asp?WKI_ID=66188

ABSTRACT: Compile case study experiences related to the security validation and assurance for the integration and conformity of IoT applications with an existing IoT architecture in order to have a common understanding in MTS and related committees and to support trustworthiness. Industrial experiences may cover but are not restricted to the following domains: smart home, smart grid, unmanned air systems, automated driving.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2022-05

ETSI GR CIM 011 Context Information Management (CIM); NGSI-LD Testing Framework: Test Purposes Description Language (TPDL)

URL: https://www.etsi.org/deliver/etsi_gr/CIM/001_099/011/01.01.01_60/gr_CIM011v010101p.pdf

ABSTRACT: The present document is a choice of Test Purposes Description Language (TPDL), with the intention to capture all of the information required by the Test Template and should be parseable using software.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2021-04

ETSI GS CIM 016 Context Information Management (CIM); NGSI-LD Testing Framework: Test Template

URL: https://www.etsi.org/deliver/etsi_gs/CIM/001_099/016/01.01.01_60/gs_CIM016v010101p.pdf

ABSTRACT: The Testing Framework (document format) specifies a testing framework defining a methodology for the development of the test strategies, test systems and resulting test specifications. The present document identifies the implementation under test (scope of the testing), the format for the test specification, the test architecture, the points of control and observation, the naming conventions (e.g. for test case ID and test case grouping ID), etc. It also provides the Implementation Conformance Statement which is basically a checklist for a client-owner so they know what parts of the specification will be tested and if any is optional. The ICS will be published as a separate GS.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2021-04

ETSI SAREF ontology SAREF: the Smart Applications REference ontology

URL: <https://saref.etsi.org/core/>

ABSTRACT: The Smart Applications REference ontology (SAREF) is intended to enable interoperability between solutions from different providers and among various activity sectors in the Internet of Things (IoT), thus contributing to the development of the global digital market.

Report of TWG-IIoT & EDGE: **Landscape of Internet of Things (IoT) Standards**

DOCUMENT TYPE: Open_Source

PUBLICATION DATE: 2020-02

ETSI TR 103 375 SmartM2M; IoT Standards landscape and future evolutions

URL: http://www.etsi.org/deliver/etsi_tr/103300_103399/103375/01.01.01_60/tr_103375v010101p.pdf

ABSTRACT: The scope of this document is a) to provide an overview of the IoT standards landscape: requirements, architecture, protocols, tests and related open source projects; b) to provide the roadmaps of the IoT standards, when they are available and to analyse the interactions of standards and open source in the context of IoT.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2016-10

ETSI TR 103 376 SmartM2M; IoT LSP use cases and standards gaps

URL: http://www.etsi.org/deliver/etsi_tr/103300_103399/103376/01.01.01_60/tr_103376v010101p.pdf

ABSTRACT: The scope of this document is, starting from the use case families selected for the IoT Large Scale Pilots (LSPs)a) to provide the collection of all missing functionalities that have been identified in standards bodies (SDOs) to offer solutions addressing the use case requirements, b) to check that there are no omissions in the standardization activity with regard to the use cases. In particular, gaps with respect to the framework as identified by oneM2M should be identified, c) to propose some recommendations to overcome potential gaps. Particular attention will be paid on horizontal application layer standardisation and to assure an interworking framework among different vertical industrial segments.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2016-10

ETSI TR 103 527 SmartM2M; Virtualized IoT Architectures with Cloud Back-ends

URL: http://www.etsi.org/deliver/etsi_tr/103500_103599/103527/01.01.01_60/tr_103527v010101p.pdf

ABSTRACT: Scope: identification of new architectural elements (components, required mappings, etc.) that are required to address IoT on a cloud back-end. Description of use cases that benefit from virtualization.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2018-07

ETSI TR 103 528 SmartM2M; Landscape for open source and standards for cloud native software applicable for a Virtualized IoT service layer

URL: http://www.etsi.org/deliver/etsi_tr/103500_103599/103528/01.01.01_60/tr_103528v010101p.pdf

ABSTRACT: provides a detailed description of open source projects, their key features and their level of maturity for the purpose of building a virtualized IoT service layer.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2018-08

ETSI TR 103 537 Plugtests™ preparation on Semantic Interoperability


 **URL:** https://www.etsi.org/deliver/etsi_tr/103500_103599/103537/01.01.01_60/tr_103537v010101p.pdf

ABSTRACT: As part of its activities towards platforms interoperability, the document aims at preparing a Plugtests™ event on Semantic Interoperability. For this Plugtests™ event, the interoperability will be based on AIOTI High Level Architecture, oneM2M base ontology (linked to ETSI SmartM2M SAREF one) and oneM2M Service Layer information sharing, with the objective to demonstrate a more practical/industrial use. The document intends to identify the testing requirements from the semantic interoperability standards, especially those collected in ETSI TR 103 535 and ETSI TR 103 536.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2019-09

ETSI TR 103 778 SmartM2M; Use cases for cross-domain data usability of IoT devices

 **URL:** http://www.etsi.org/deliver/etsi_tr/103700_103799/103778/01.01.01_60/tr_103778v010101p.pdf

ABSTRACT: The scope of this document is to a) identify, select and describe use cases where the IoT data and services require usability specifications; b) analyse the impact of these use cases for both machines and humans.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2021-12

ETSI TR 103 783 SmartM2M; SAREF: SDT interoperability and oneM2M base ontology alignment

 **URL:** https://www.etsi.org/deliver/etsi_tr/103700_103799/103783/01.01.01_60/tr_103783v010101p.pdf

ABSTRACT: The objective of this technical report is to assure full alignment of SAREF and the oneM2M base ontology and provide guidelines about how devices adopting the oneM2M SDT (Smart Device Template) informational model can interoperate seamlessly with oneM2M devices and systems adopting SAREF and vice versa.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-05

ETSI TR 118 503 V1.0.0 Architecture Part 2: Study for the merging of architectures proposed for consideration

 **URL:** https://2020.standict.eu/sites/default/files/tr_118503v010000p.pdf

ABSTRACT: The present document provides an evaluation of existing M2M-related Architecture work undertaken by the founding partners of oneM2M, including: the Association of Radio Industries and Businesses (ARIB) and the Telecommunication Technology Committee (TTC) of Japan; the Alliance for Telecommunications Industry Solutions (ATIS) and the Telecommunications Industry Association (TIA) of the USA; the China Communications Standards Association (CCSA); the European Telecommunications Standards Institute (ETSI); and the Telecommunications Technology Association (TTA) of Korea. Common Functional Entities and Reference Points are identified, as well as critical differences. New functionality will not be considered as part of this study. The present document is intended to ensure a common understanding of existing M2M Architectural approaches, in order to facilitate future normative work resulting in oneM2M Technical Specifications. The present document has been prepared under the auspices of the oneM2M Technical Plenary, by the oneM2M Architecture Working Group.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2015-04

ETSI TS 103 264 SmartM2M; Smart Applications; Reference Ontology and oneM2M Mapping

URL: https://www.etsi.org/deliver/etsi_ts/103200_103299/103264/03.01.01_60/ts_103264v030101p.pdf

ABSTRACT: The present document provides a standardized framework for the Smart Applications REFerence ontology based on the results of a European Commission Study Group on Smart Appliances ontologies and of different Specialist Task Forces that have supported the maintenance and evolution of the ontology taking into account all the interest of the relevant stakeholders. This reference ontology contains recurring concepts that are used in several domains and is a basis for extensions in particular domains.

This document also defines the equivalent mapping between the Smart Applications REFerence Ontology and the oneM2M Base Ontology.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2020-02

ETSI TS 103 267 SmartM2M; Smart Applications; Communication Framework

URL: http://www.etsi.org/deliver/etsi_ts/103200_103299/103267/02.01.01_60/ts_103267v020101p.pdf

ABSTRACT: Alignment of the SAREF communication framework to oneM2M latest developments.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2020-02

ETSI TS 103 673 SmartM2M; SAREF Development Framework and Workflow, Streamlining the Development of SAREF and its Extensions

URL: http://www.etsi.org/deliver/etsi_ts/103600_103699/103673/01.01.01_60/ts_103673v010101p.pdf

ABSTRACT: To define the development workflow of SAREF based on the ETSI forge. The development workflow defines the different types of issues (labels), the development workflow (branches and merge requests) and the decision process for accepting merge requests by the SmartM2M. This deliverable will enable the SAREF developers to speed up the development of SAREF and its extensions.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2020-08

ETSI TS 103 780 SmartM2M; SAREF: oneM2M usage guidelines

URL: Not available yet

ABSTRACT: The objective of this standard is to provide guidelines for the usage of SAREF over oneM2M (also including the SDT interoperability) for vertical industry sectors.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: Under develop-ment

IEC 60869-1:2018 Fibre optic interconnecting devices and passive components - Fibre optic passive power control devices - Part 1: Generic specification

 **URL:** <https://webstore.iec.ch/publication/60884>


ABSTRACT: IEC 60869-1:2018 is available as (<https://webstore.iec.ch/publication/64221>) IEC 60869-1:2018 RLV, which contains the International Standard and its Redline version, showing all changes of the technical content compared to the previous edition. IEC 60869-1:2018 applies to fibre optic passive power control devices. These have all of the following general features:

- (1) they are passive in that they contain no optoelectronic or other transducing elements;
- (2) they have two ports for the transmission of optical power and control of the transmitted power in a fixed or variable fashion;
- (3) the ports are non-connectorized optical fibre pigtails, connectorized optical fibres or receptacles.

This document establishes generic requirements for the following passive optical devices:

- (1) optical attenuator;
- (2) optical fuse;
- (3) optical power limiter.

This document also provides generic information including terminology for the IEC 61753-05x series. Published IEC 61753-05x series documents are listed in Bibliography. This fifth edition cancels and replaces the fourth edition published in 2012 and constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous edition: a) the terms and definitions have been reviewed; b) the requirement concerning the IEC Quality Assessment System has been reviewed; c) the clause concerning quality assessment procedures has been deleted; d) Annex G, relating to technical information on variable optical attenuators, has been added.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-11-16

IEC 60875-1:2015 Fibre optic interconnecting devices and passive components - Non-wavelength-selective fibre optic branching devices - Part 1: Generic specification


 **URL:** <https://webstore.iec.ch/publication/22396>

ABSTRACT: IEC 60875-1:2015 applies to non-wavelength-selective fibre optic branching devices, all exhibiting the following features:

- (1) they are passive, in that they contain no optoelectronic or other transducing elements;
- (2) they have three or more ports for the entry and/or exit of optical power, and share optical power among these ports in a predetermined fashion;
- (3) the ports are optical fibres, or optical fibre connectors.

This standard establishes uniform requirements for the optical, mechanical and environmental properties. This sixth edition cancels and replaces the fifth edition published in 2010 and constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous edition:

- (1) removal of terms and definitions for splitter, coupler, symmetric non-wavelength-selective branching device, asymmetric non-wavelength-selective branching device;
- (2) addition of terms and definitions for bidirectional non-wavelength-selective branching device and non-bidirectional non-wavelength-selective branching device, removal of assessment level.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-05-07

IEC 61300-1:2022 Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 1: General and guidance

 **URL:** <https://webstore.iec.ch/publication/67663>

ABSTRACT: IEC 61300-1:2022 contains the International Standard and its Redline version, showing all changes of the technical content compared to the previous edition. IEC 61300-1:2022 provides general information and guidance for the basic test and measurement procedures defined in IEC 61300-2 (all parts) and IEC 61300-3 (all parts) for interconnecting devices, passive components, mechanical splices, fusion splice protectors, fibre management systems and protective housings. This document is used in combination with the relevant specification which defines the tests to be used, the required degree of severity for each of them, their sequence, if relevant, and the permissible performance limits. In the event of conflict between this document and the relevant specification, the latter takes precedence. This fifth edition cancels and replaces the fourth edition published in 2016. This edition constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous edition:

- (1) addition of the information of measurement uncertainties in 4.2.1;
- (2) change of the requirements for attenuation variation in 4.2.2;
- (3) addition of the multimode launch conditions of other fibres than A1-OM2, A1-OM3, A1-OM4, A1-OM5 and A3e in 10.4;
- (4) addition of the multimode launch conditions of the planer waveguide in 10.6;
- (5) splitting Annex A for EF and Annex B for EAF; (5) correction of errors in the definitions of encircled flux and encircled angular flux.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2022-04-04

IEC 61753-1:2018 Fibre optic interconnecting devices and passive components - Performance standard - Part 1: General and guidance

 **URL:** <https://webstore.iec.ch/publication/67249>

ABSTRACT: IEC 61753-1:2018 contains the International Standard and its Redline version, showing all changes of the technical content compared to the previous edition. IEC 61753-1:2018 provides guidance for the drafting of performance standards for all passive fibre optic products. This document defines the tests and severities which form the performance categories or general operating service environments and identifies those tests which are considered to be product specific. Test and severity details are given in Annex A. This second edition cancels and replaces the first edition published in 2007. It constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous edition:

- a) definitions updated with new products: wall outlets, wall or pole mounted boxes, splices, ODF modules, street cabinets, hardened connectors and field mountable connectors;
- b) categories U and O are replaced by categories OP and OP+. No mandatory sequence in category OP+. Category OP+ contains the tests from category OP with the addition of only 4 other tests;
- c) addition of Category I (Industrial);
- d) temperature ranges added (with the HD suffix to the categories C, OP, OP+ and I) in case passive optical components are placed in a housing together with active electronics (HD stands for "heat dissipation");
- e) the height of category A changed from 3 m to ground level (0 m);
- f) the lower level height of category G environment changed from ground level (0 m) to -1 m below ground level. Upper level remains at 3 m above ground level;
- g) addition of performance tests, test severities and performance criteria for new products: Wall outlet, wall or pole mounted boxes, mechanical splices, fusion splice protectors, ODF modules, street cabinets, field mountable connectors and hardened optical connectors;

- h) test severity of “Mating durability” test for connectors in categories C, OP ,OP+ and I is reduced to 200 cycles for connectors with cylindrical ferrules and 50 cycles for connectors with rectangular ferrules;
- i) test severity of “Change of temperature” test for connectors and passive optical components in category I is reduced from 20 cycles to 12 cycles (harmonized with connectors and components from other categories);
- j) test severity of “Flexing of strain relief” test for connectors in categories C, OP and OP+ is reduced to 50 cycles;
- k) test severities of “Assembly and disassembly of fibre optic mechanical splices, fibre management systems and closures” test for all enclosures is reduced to 5 cycles;
- l) test severities of “Change of temperature” test for all protective housings in categories C, A, G and S is reduced from 20 cycles to 12 cycles (harmonized with connectors and components);
- m) test severities of “Resistance to solvents and contaminating fluids” test for closures in categories G and S changed – kerosene is removed, diesel oil exposure reduced to 1 h immersion and 24 h drying at room temperature;
- n) sealing performance criteria of sealed closures for categories G and A are reduced to 20 kPa overpressure.
- o) the change in attenuation criterion for connectors has changed from peak-to-peak into a +/- deviation from the original value of the transmitted power at the start of the test (harmonized with the change in attenuation criterion for components, splices and protective housings).

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2018-08-15

IEC 61754-4:2022 Fibre optic interconnecting devices and passive components - Fibre optic connector interfaces - Part 4: Type SC connector family

🔗 URL: <https://webstore.iec.ch/publication/29284>

ABSTRACT: IEC 61754-4:2022 contains the International Standard and its Redline version, showing all changes of the technical content compared to the previous edition. IEC 61754-4:2021 specifies the standard interface dimensions for type SC family of connectors. This third edition cancels and replaces the second edition published in 2013 and constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous edition:

- (1) the test method IEC 61300-3-22 for the compression force of the ferrule was added;
- (2) Annex A (informative) with cut out dimension requirements for testing the strength of mounted adaptors was added.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2022-02-28

IEC 61754-7-3:2019 Fibre optic interconnecting devices and passive components - Fibre optic connector interfaces - Part 7-3: Type MPO connector family - Two fibre rows 16 fibre wide

🔗 URL: <https://webstore.iec.ch/publication/26692>

ABSTRACT: IEC 61754-7-3: 2019 defines the standard interface dimensions for type MPO family of connectors with two rows of 16 fibres.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2019-04-05

IEC 61756-1:2019 Fibre optic interconnecting devices and passive components - Interface standard for fibre management systems - Part 1: General and guidance

 **URL:** <https://webstore.iec.ch/publication/59508>

ABSTRACT: IEC 61756-1:2019 covers general information on fibre management system interfaces. It includes the definitions and rules under which a fibre management system interface is created and it provides also criteria to identify the minimum bending radius for stored fibres. This document allows both single-mode and multimode fibre to be used. Liquid, gas or dust sealing requirements at the cable entry area or cable element ending are not covered in this document. This second edition cancels and replaces the first edition published in 2006. This edition constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous edition:

- (1) addition of figures to show the interface between protective housing and fibre management system;
- (2) addition of definitions for protective housing, closure, wall box, street cabinets and optical distribution frame modules;
- (3) addition of table with dimensions of fusion splice protectors and mechanical splices;
- (4) addition of method to identify the minimum bending radius for stored fibres;
- (5) addition of clause for other factors relevant to fibre management systems;
- (6) addition of annex A for example of calculating the minimum bending radius of stored fibres in a fibre management system.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2019-11-27

IEC 62005-1:2001 Reliability of fibre optic interconnecting devices and passive components - Part 1: Introductory guide and definitions

 **URL:** <https://webstore.iec.ch/publication/6280>

ABSTRACT: Is a guide for assessing the reliability of all types of fibre-optic interconnecting devices and passive optical components. It applies to passive devices for connection, branching, switching, minimization of reflection, control of power/attenuation, dispersion compensation, modulation and wavelength selection or filtering.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2001-03-07

IEC 62099:2001 Fibre optic wavelength switches - Generic specification

 **URL:** <https://webstore.iec.ch/publication/6459>

ABSTRACT: Applies to fibre optic wavelength switches, which are: - passive optical devices, without optical amplification or opto-electronic conversion - restricted to the routing of light rather than intentional power division - have two or more ports with optical fibres or connectors. The standard establishes switch requirements and quality assessment procedures.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2001-03-30

IEEE 1872.2-2021 IEEE Approved Draft Standard for Autonomous Robotics (AuR) Ontology

 **URL:** <https://standards.ieee.org/ieee/1872.2/7094/>

ABSTRACT: This standard extends IEEE 1872-2015 Standard for Ontologies for Robotics and Automation to represent additional domain-specific concepts, definitions, and axioms commonly used in Autonomous Robotics (AuR). This standard is general and can be used in many ways - for example, to specify the domain knowledge needed to unambiguously describe the design patterns of AuR systems, to represent AuR system architectures in a unified way, or as a guideline to build autonomous systems consisting of robots operating in various environments.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-09

IEEE 754-2008 IEEE Standard for Floating-Point Arithmetic

 **URL:** <https://ieeexplore.ieee.org/document/4610935>

ABSTRACT: This standard specifies formats and methods for floating-point arithmetic in computer systems: standard and extended functions with single, double, extended, and extendable precision, and recommends formats for data interchange. Exception conditions are defined and standard handling of these conditions is specified.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2008-08

IETF RFC 8610 Concise Data Definition Language (CDDL): A Notational Convention to Express Concise Binary Object Representation (CBOR) and JSON Data Structures

 **URL:** <https://datatracker.ietf.org/doc/rfc8610/>

ABSTRACT: This document proposes a notational convention to express Concise Binary Object Representation (CBOR) data structures (RFC 7049). Its main goal is to provide an easy and unambiguous way to express structures for protocol messages and data formats that use CBOR or JSON.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2019-06

IETF RFC 8655 Deterministic Networking Architecture

 **URL:** <https://datatracker.ietf.org/doc/rfc8655/>

ABSTRACT: This document provides the overall architecture for Deterministic Networking (DetNet), which provides a capability to carry specified unicast or multicast data flows for real-time applications with extremely low data loss rates and bounded latency within a network domain.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2019-10

IETF RFC 8742 Concise Binary Object Representation (CBOR) Sequences

 **URL:** <https://datatracker.ietf.org/doc/rfc8742/>

ABSTRACT: his document describes the Concise Binary Object Representation (CBOR) Sequence format and associated media type “application/cbor-seq”. A CBOR Sequence consists of any number of encoded CBOR data items, simply concatenated in sequence.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-02

IETF RFC 8746 Concise Binary Object Representation (CBOR) Tags for Typed Arrays

 **URL:** <https://datatracker.ietf.org/doc/rfc8746/>

ABSTRACT: This document makes use of this extensibility to define a number of CBOR tags for typed arrays of numeric data, as well as additional tags for multi-dimensional and homogeneous arrays. It is intended as the reference document for the IANA registration of the CBOR tags defined.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-02

IETF RFC 8943 Concise Binary Object Representation (CBOR) Tags for Date

 **URL:** <https://datatracker.ietf.org/doc/rfc8943/>

ABSTRACT: This specification defines a CBOR tag for a date text string (as per RFC 3339) for applications needing a textual date representation within the Gregorian calendar without a time. It also defines a CBOR tag for days since the date 1970-01-01 in the Gregorian calendar for applications needing a numeric date representation without a time. This specification is the reference document for IANA registration of the CBOR tags defined.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-11

IETF RFC 8949 Concise Binary Object Representation (CBOR)

 **URL:** <https://datatracker.ietf.org/doc/rfc8949/>

ABSTRACT: This document obsoletes RFC 7049, providing editorial improvements, new details, and errata fixes while keeping full compatibility with the interchange format of RFC 7049. It does not create a new version of the format.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-11

IETF RFC 8964 Deterministic Networking (DetNet) Data Plane: MPLS

 **URL:** <https://datatracker.ietf.org/doc/rfc8964/>

ABSTRACT: This document specifies the Deterministic Networking (DetNet) data plane when operating over an MPLS Packet Switched Network.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-01

ISO ISO/PAS 19450:2015 Automation systems and integration - Object-Process Methodology

 **URL:** <https://www.iso.org/standard/84612.html?browse=tc>

ABSTRACT: ISO/PAS 19450:2015 specifies Object-Process Methodology (OPM) with detail sufficient for enabling practitioners to utilise the concepts, semantics, and syntax of Object-Process Methodology as a modelling paradigm and language for producing conceptual models at various extents of detail, and for enabling tool vendors to provide application modelling products to aid those practitioners.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-12

ISO/IEC 21823-1:2019 Interoperability for internet of things systems -- Part 1: Framework

 **URL:** <https://webstore.iec.ch/publication/60604>

ABSTRACT: ISO/IEC 21823-1:2019(E) provides an overview of interoperability as it applies to IoT systems and a framework for interoperability for IoT systems. This document enables IoT systems to be built in such a way that the entities of the IoT system are able to exchange information and mutually use the information in an efficient way. This document enables peer-to-peer interoperability between separate IoT systems. This document provides a common understanding of interoperability as it applies to IoT systems and the various entities within them.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2019-02

ISO/IEC 21823-2:2020 Internet of Things (IoT) - Interoperability for IoT systems - Part2 : Transport interoperability

 **URL:** <https://webstore.iec.ch/publication/61085>

ABSTRACT: ISO/IEC 21823-2:2020 (E) specifies a framework and requirements for transport interoperability, in order to enable the construction of IoT systems with information exchange, peer-to-peer connectivity and seamless communication both between different IoT systems and also among entities within an IoT system. This document specifies: transport interoperability interfaces and requirements between IoT systems; transport interoperability interfaces and requirements within an IoT system.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-04

ISO/IEC 21823-3:2021 Internet of Things (IoT) - Interoperability for IoT systems - Part 3: Semantic interoperability

 **URL:** <https://webstore.iec.ch/publication/61088>

ABSTRACT: ISO/IEC 21823-3:2021 provides the basic concepts for IoT systems semantic interoperability, as described in the facet model of ISO/IEC 21823-1, including: a) requirements of the core ontologies for semantic interoperability; b) best practices and guidance on how to use ontologies and to develop domain-specific applications, including the need to allow for extensibility and connection to external ontologies; c) cross-domain specification and formalization of ontologies to provide harmonized utilization of existing ontologies; d) relevant IoT ontologies along with comparative study of the characteristics and approaches in terms of modularity, extensibility, reusability, scalability, interoperability with upper ontologies, and so on, and e) use cases and service scenarios that exhibit necessities and requirements of semantic interoperability.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-02

ISO/IEC 21823-4:2022 Internet of Things (IoT) - Interoperability for IoT systems - Part 4: Syntactic interoperability

 **URL:** <https://webstore.iec.ch/publication/65649>

ABSTRACT: ISO/IEC 21823-4:2022 specifies the IoT interoperability from a syntactic point of view. In ISO/IEC 21823-1: Framework [2], five facets are described for IoT interoperability, i.e. transport, semantic, syntactic, behavioural and policy. In this document, the following specifications for IoT interoperability from syntactic viewpoint are included: a) a principle of how to achieve syntactic interoperability among IoT systems which include IoT devices; b) requirements on information related to IoT devices for syntactic interoperability; and c) a framework for processes on developing information exchange rules related to IoT devices from the syntactic viewpoint.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2022-03

ISO/IEC 29182-1:2013 Information technology - Sensor networks: Sensor Network Reference Architecture (SNRA) - Part 1: General overview and requirements

 **URL:** <https://webstore.iec.ch/publication/11411>

ABSTRACT: ISO/IEC 29182-1:2013 provides a general overview of the characteristics of a sensor network and the organization of the entities that comprise such a network. It also describes the general requirements that are identified for sensor networks.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2013-06

ISO/IEC 29182-2:2013 Information technology - Sensor networks: Sensor Network Reference Architecture (SNRA) - Part 2: Vocabulary and terminology

 **URL:** <https://webstore.iec.ch/publication/11412>

ABSTRACT: ISO/IEC 29182-2:2013 is intended to facilitate the development of International Standards in sensor networks. It presents terms and definitions for selected concepts relevant to the field of sensor networks. It establishes a general description of concepts in this field and identifies the

relationships among those concepts. It may also be used as guidance for development of other parts of ISO/IEC 29182 and any other sensor network related standard.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2013-06

ISO/IEC 29182-3:2014 Information technology - Sensor networks: Sensor Network Reference Architecture (SNRA) - Part 3: Reference architecture views

🔗 URL: <https://webstore.iec.ch/publication/11413>

ABSTRACT: ISO/IEC 29182-3:2014 provides Sensor Network Reference Architecture (SNRA) views. The architecture views include business, operational, systems, and technical perspectives, and these views are presented in functional, logical, and/or physical views where applicable. ISO/IEC 29182-3:2014 focuses on high-level architecture views which can be further developed by system developers and implementers for specific applications and services.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2014-02

ISO/IEC 29182-4:2013 Information technology - Sensor networks: Sensor Network Reference Architecture (SNRA) - Part 4: Entity models

🔗 URL: <https://webstore.iec.ch/publication/11414>

ABSTRACT: The purpose of the ISO/IEC 29182 series is to a) - provide guidance to facilitate the design and development of sensor networks, b) improve interoperability of sensor networks, and c) make sensor network components plug-and-play, so that it becomes fairly easy to add/remove sensor nodes to/from an existing sensor network. ISO/IEC 29182-4 presents models for the entities that enable sensor network applications and services according to the Sensor Network Reference Architecture (SNRA).

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2013-07

ISO/IEC 29182-5:2013 Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 5: Interface definitions

🔗 URL: <https://webstore.iec.ch/publication/11415>

ABSTRACT: ISO/IEC 29182-5:2013 provides the definitions and requirements of sensor network (SN) interfaces of the entities in the Sensor Network Reference Architecture and covers the following aspects: - interfaces between functional layers to provide service access for the modules in the upper layer to exchange messages with modules in the lower layer; - interfaces between entities introduced in the Sensor Network Reference Architecture enabling sensor network services and applications.


📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2013-07

ISO/IEC 29182-5:2013 Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 6: Applications

 **URL:** <https://webstore.iec.ch/publication/11416>

ABSTRACT: ISO/IEC 29182-6:2014, describes and provides - a compilation of sensor network applications for which International Standardized Profiles (ISPs) are needed, - guidelines for the structured description of sensor network applications, and - examples for structured sensor network applications. It does not cover ISPs for which drafting rules are described in ISO/IEC TR 10000. Due to the generic character of ISO/IEC 29182, fully developed ISPs will not be included in this International Standard.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2014-07

ISO/IEC 29182-7:2015 Information technology -- Sensor networks: Sensor Network Reference Architecture (SNRA) -- Part 7: Interoperability guidelines

 **URL:** <https://webstore.iec.ch/publication/21827>

ABSTRACT: ISO/IEC 29182-7:2015 provides a general overview and guidelines for achieving interoperability between sensor network services and related entities in a heterogeneous sensor network.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-02

ISO/IEC 30101:2014 Information technology -- Sensor networks: Sensor network and its interfaces for smart grid system

 **URL:** <https://webstore.iec.ch/publication/11540>

ABSTRACT: ISO/IEC 30101:2014 is for sensor networks in order to support smart grid technologies for power generation, distribution, networks, energy storage, load efficiency, control and communications, and associated environmental challenges. This International Standard characterizes the requirements for sensor networks to support the aforementioned applications and challenges. Data from sensors in smart grid systems is collected, transmitted, published, and acted upon to ensure efficient coordination of the various systems and subsystems. The intelligence derived through the sensor networks supports synchronization, monitoring and responding, command and control, data/information processing, security, information routing, and human-grid display/graphical interfaces. This International standard specifies: - interfaces between the sensor networks and other networks for smart grid system applications, - sensor network architecture to support smart grid systems, - interface between sensor networks with smart grid systems, and - sensor network based emerging applications and services to support smart grid systems.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2014-11

ISO/IEC 30128:2014 Information technology -- Sensor networks -- Generic Sensor Network Application Interface

 **URL:** <https://webstore.iec.ch/publication/11545>

ABSTRACT: ISO/IEC 30128:2014 specifies the interfaces between the application layers of service

providers and sensor network gateways, which is Protocol A in interface 3, defined in ISO/IEC 29182-5. This International Standard covers: - description of generic sensor network applications' operational requirements, - description of sensor network capabilities, and - mandatory and optional interfaces between the application layers of service providers and sensor network gateways.

🔗 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2014-11

ISO/IEC 30141:2018 Internet of things and related technologies

🔗 URL: <https://webstore.iec.ch/publication/60606>

ABSTRACT: This document provides a standardized IoT Reference Architecture using a common vocabulary, reusable designs and industry best practices. It uses a top down approach, beginning with collecting the most important characteristics of IoT, abstracting those into a generic IoT Conceptual Model, deriving a high level system based reference with subsequent dissection of that model into five architecture views from different perspectives.

🔗 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2020-08

ISO/IEC 30141:2018 Internet of Things (IoT) - Reference Architecture

🔗 URL: <https://webstore.iec.ch/publication/60606>

ABSTRACT: ISO/IEC 30141:2018 This document provides a standardized IoT Reference Architecture using a common vocabulary, reusable designs and industry best practices. It uses a top down approach, beginning with collecting the most important characteristics of IoT, abstracting those into a generic IoT Conceptual Model, deriving a high level system based reference with subsequent dissection of that model into the four architecture views (functional view, system view, networking view and usage view) from different perspectives.

🔗 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2018-08

ISO/IEC 30147:2021 Internet of Things (IoT) - Integration of IoT trustworthiness activities in ISO/IEC/IEEE 15288 system engineering processes

🔗 URL: <https://webstore.iec.ch/publication/62644>

ABSTRACT: ISO/IEC 30147:2021(E) provides system life cycle processes to implement and maintain trustworthiness in an IoT system or service by applying and supplementing ISO/IEC/IEEE 15288:2015. The system life cycle processes are applicable to IoT systems and services common to a wide range of application areas.

🔗 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2021-05

ISO/IEC 30161-1:2020 Internet of things (IoT) - Data exchange platform for IoT services - Part 1: General requirements and architecture

 **URL:** <https://webstore.iec.ch/publication/63404>


ABSTRACT: ISO/IEC 30161-1:2020(E) specifies requirements for an Internet of Things (IoT) data exchange platform for various services in the technology areas of:

1. the middleware components of communication networks allowing the co-existence of IoT services with legacy services;
2. the end-points performance across the communication networks among the IoT and legacy services;
3. the IoT specific functions and functionalities allowing the efficient deployment of IoT services;
4. the IoT service communication networks' framework and infrastructure;
5. the IoT service implementation guideline for the IoT data exchange platform

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-11

ISO/IEC 30161-2 Information technology — Internet of Things (IoT) — Data exchange platform for IoT services – Part 2: Transport interoperability between nodal points

 **URL:** https://www.iec.ch/ords/f?p=103:38:411250985150323:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:20486,23,104999

ABSTRACT: This document specifies the following items for the transport interoperability between nodal points in the IoT data exchange platform (IoT DEP): (1) Requirements, (2) Functional blocks and (3) Operation mechanism. When the number of connected IoT devices and IoT-users increase or the IoT system is deployed widely as a horizontal deployment, IoT devices and IoT-users are connected to each other through multiple nodal points. In ISO/IEC 30161-1, a nodal point is defined as a point for relaying IoT data according to the routing information decided by a communication protocol, and a communication entity in the IoT DEP network, which is any of an access network, a service network, or a user network. To provide data exchange among nodal points in an IoT system with small overheads or acquiring data with low latency, this document focuses on the transport interoperability for efficient transfer of IoT data among nodal points in an IoT system.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under develop-ment

ISO/IEC 30165:2021 Internet of things (IoT) - Real-time IoT framework


 **URL:** <https://webstore.iec.ch/publication/63972>

ABSTRACT: ISO/IEC 30165:2021 specifies the framework of a real-time IoT (RT-IoT) system, including: a) RT-IoT system conceptual model based on domain-based IoT reference model defined in ISO/IEC 30141; b) impacts of time-parameter in terms of four viewpoints (time, communication, control and computation).


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-07

ISO/IEC 30178 ED1 Internet of Things (IoT) - Data format, value and coding


 **URL:** https://www.iec.ch/dyn/www/f?p=103:38:204774363295796:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:20486,23,104965

ABSTRACT: This document defines common formats, value, and coding for Internet of things (IoT).


 **DOCUMENT TYPE:** Standard_Specification


 **PUBLICATION DATE:** Under develop-ment

ISO/IEC 30181 ED1 Internet of Things (IoT) – Functional architecture for resource ID interoperability

 **URL:** https://www.iec.ch/dyn/www/f?p=103:38:204774363295796:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:20486,23,108552

ABSTRACT: This document specifies functional requirements and architecture about the following items for resource interoperability among heterogeneous IoT platforms (e.g., oneM2M, GS1 OIiot, IBM Watson IoT, OCF IoTivity, and FIWARE, etc.) through the conversion of resource identifiers (IDs) and paths (e.g., uniform resource identifier (URI)): (1) Requirements for interoperability of resource IDs in the heterogeneous IoT platforms; (2) Functional architecture for converting IDs and paths of resources on heterogeneous platforms; and, (3) Functional architecture for mapping and managing resource IDs among heterogeneous platforms.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under develop-ment

ITU-T Study Group 20 - Internet of things (IoT) and smart cities and communities (SC&C)

 **URL:** <https://www.itu.int/en/ITU-T/about/groups/Pages/sg20.aspx>

ABSTRACT: SG20 develops international standards to enable the coordinated development of IoT technologies, including machine-to-machine communications and ubiquitous sensor networks. A central part of this study is the standardization of end-to-end architectures for IoT, and mechanisms for the interoperability of IoT applications and datasets employed by various vertically oriented industry sectors.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** N/A

ITU-T Y.4208 Internet of things requirements for support of edge computing

 **URL:** <https://www.itu.int/itu-t/recommendations/rec.aspx?rec=14162>

ABSTRACT: Some of the capabilities offered by the Internet of thing (IoT), e.g., capabilities for computing, storage and analytics, are evolving in closer proximity to IoT data sources. Recommendation ITU-T Y.4208 provides an overview of related challenges faced by the IoT and describes how IoT-supporting edge computing (EC) may address these challenges. From the edge-computing deployment perspective, service requirements for support of EC capabilities in the IoT are identified, as well as related functional requirements. As an example, scenarios of EC deployment in different application domains, EC scenarios for vehicle-to-everything (V2X) and for smart manufacturing are provided in an appendix.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-01

ITU-T Q.3952 (01/2018) The architecture and facilities of Model network for IoT testing

 **URL:** <https://handle.itu.int/11.1002/1000/13489>

ABSTRACT: The testing of IoT technologies requires the specific model network which can simulate different scenarios of IoT implementations. This recommendation describes the architecture and facilities of Model Network for IoT testing.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-01

ITU-T Q.4062 (09/2020) Framework for IoT Testing

 **URL:** <https://handle.itu.int/11.1002/1000/14387>

ABSTRACT: The main goal of this recommendation is the testing framework for Internet of Things definition. Conformity, interoperability and benchmarking testing frameworks for IoT are the recommendation scope.

 **DOCUMENT TYPE:** Framework

 **PUBLICATION DATE:** 2020-09

ITU-T Q.4063 (09/2020) Framework for testing identification systems used in Internet of things

 **URL:** <https://handle.itu.int/11.1002/1000/14391>

ABSTRACT: The recommendation provides a description and test suites of identification procedures used in Internet of Things (IoT). There are a lot of applications of Internet of Things, the testing of their identity might be considered as a very important issue as it allows customer to ensure the authenticity of the IoT. The classification of IoT, in terms of testing of their identification procedures and the relevant testing approaches are subjects of this Recommendation.

 **DOCUMENT TYPE:** Framework

 **PUBLICATION DATE:** 2020-09

ITU-T Y.4001/F.748.2 (11/2015) Overview and reference model of machine socialization

 **URL:** <https://handle.itu.int/11.1002/1000/12621>

ABSTRACT: This recommendation covers the following: a) overview of machine socialization; b) requirements for machine socialization; and c) reference models of machine socialization including service model, functional model and architectural model.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-11

ITU-T Y.4002/F.748.3 (11/2015) Relation management and descriptions for machine socialisations

 **URL:** <https://handle.itu.int/11.1002/1000/12622>

ABSTRACT: This recommendation covers the following: a) relation management models for machine socialization; b) relation descriptions for machine socialization; and c) use cases for relation management models.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-11

ITU-T Y.4100/Y.2066 (06/2014) Common requirements of Internet of Things

 **URL:** <https://handle.itu.int/11.1002/1000/12169>

ABSTRACT: This recommendation provides the common requirements of the Internet of things (IoT). These requirements are based on general use cases of the IoT and IoT actors, which are built from the definition of IoT contained in Recommendation ITU-T Y.2060. The common requirements of the IoT are independent of any specific application domain, which refer to the areas of knowledge or activity applied for one specific economic, commercial, social or administrative scope, such as transport application domain and health application domain. This recommendation builds on the overview of IoT (Recommendation ITU-T Y.2060), developing the common requirements based on general use cases of the IoT and the IoT actors and taking into account important areas of consideration from a requirement perspective. Some representative use cases of the IoT, which are abstracted from application domains, are also provided. The common requirements of the IoT specified in this Recommendation are classified into the categories of non-functional requirements, application support requirements, service requirements, communication requirements, device requirements, data management requirements and security and privacy protection requirements.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2014-06

ITU-T Y.4101/Y.2067 Common requirements and capabilities of gateways for IoT applications

 **URL:** <https://handle.itu.int/11.1002/1000/13384>

ABSTRACT: This Recommendation provides the common requirements and capabilities of a gateway for Internet of things (IoT) applications. The common requirements and capabilities provided are intended to be generally applicable in gateway application scenarios.

The scope of this Recommendation includes:

- (1) general characteristics of a gateway for IoT applications;
- (2) common requirements of a gateway for IoT applications;
- (3) common capabilities of a gateway for IoT applications.
- (4) Use cases of a gateway for IoT applications are provided in appendices.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-10

ITU-T Y.4102/Y.2074 (01/2015) Requirements for Internet of Things devices and operation of Internet of Things applications during disaster

 **URL:** <https://handle.itu.int/11.1002/1000/12421>

ABSTRACT: This recommendation provides requirements for IoT devices that can be used for operation of IoT applications in the context of disaster in addition to the common requirements of IoT [ITU-T Y.2066]. It also provides special requirements for operation of IoT applications during disaster. The scope of this Recommendation includes: a) requirements for IoT devices in the context of disaster; b) requirements for operation of IoT applications during disaster (for each of the three identified operating strategies). This Recommendation is relevant for IoT application developers and IoT service providers as well as for emergency service providers.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-01

ITU-T Y.4111/Y.2076 (02/2016) Semantic related requirements and framework of the Internet of Things

 **URL:** <https://handle.itu.int/11.1002/1000/12705>

ABSTRACT: This recommendation specifies semantic related requirements and framework of the Internet of Things (IoT). Taking into consideration the IoT reference model [ITU-T Y.2060], semantic requirements including those related to the four layers (i.e. Application layer, SSAS layer, Network layer and Device layer) and the management and security capabilities [ITU-T Y.2060], as well as semantic requirements across layers are specified. Based on the identified IoT semantic requirements and existing semantic related technologies, the IoT semantic framework is specified. The scope of this recommendation includes:

- a) Introduction to semantic related technologies;
- b) IoT semantic requirements; c) IoT semantic framework.

 **DOCUMENT TYPE:** Framework


 **PUBLICATION DATE:** 2016-02

ITU-T Y.4115 (04/2017) Reference architecture for IoT device capabilities exposure

 **URL:** <https://handle.itu.int/11.1002/1000/13266>

ABSTRACT: This recommendation specifies the reference architecture for IoT device capabilities exposure. The scope of this recommendation includes:

- a) the concept, general characteristics and requirements of IoT device capability exposure;
- b) the reference architecture for IoT device capability exposure including common procedures.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-04

ITU-T Y.4118 (06/2018) Internet of Things requirements and technical capabilities for support of accounting and charging

 **URL:** <https://handle.itu.int/11.1002/1000/13496>

ABSTRACT: This recommendation provides accounting and charging requirements for Internet of things (IoT). Building on the requirements and framework for accounting and charging capabilities

in the next generation network (NGN) [ITU-T Y.2233], this Recommendation provides specific requirements derived from the analysis of business use cases specific to the IoT. Based on the identified requirements, an IoT accounting and charging technical capability framework is then specified. The scope of this Recommendation includes: a) business use cases applied to the IoT; b) IoT accounting and charging requirements; c) IoT accounting and charging technical capability framework.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2018-06

ITU-T Y.4121 (06/2018) Requirements for an Internet of Things enabled network for support of applications for global processes of the Earth

🔗 URL: <https://handle.itu.int/11.1002/1000/13636>

ABSTRACT: This recommendation describes requirements of an Internet of things (IoT) enabled network for support of applications monitoring and studying global processes of the Earth. This concept of “Internet of things for monitoring and studying global processes (IoT GP)” combines geographically distributed IoT devices, and one or more control and management centres (CMCs) for the monitoring of global natural and man-made processes. This Recommendation describes key IoT GP features, deployment schemes of IoT GP devices, and requirements of the IoT GP network.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2018-06

ITU-T Y.4203 (02/2019) Requirements of things description in the Internet of things

🔗 URL: <https://handle.itu.int/11.1002/1000/13857>

ABSTRACT: The goal of this recommendation is to specify requirements for an effective way of representing things as far as possible in a homogeneous way. The focus of the document is on the following two concerns of things description: a) Representing physical things as virtual things to map the physical things into information world; b) Representing the relationship of virtual things to reflect the relationship of the represented physical things.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2019-02

ITU-T Y.4206 (06/2019) Requirements and capabilities of user-centric work space service

🔗 URL: <https://handle.itu.int/11.1002/1000/13919>

ABSTRACT: The objective of this recommendation is to identify requirements and capabilities of user-centric work space (UCS) service. In particular, the scope of this recommendation includes: a) Requirements of UCS service; b) Capability framework of UCS service; and c) Workflow of UCS service.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2019-06

ITU-T Y.4401/Y.2068 (03/2015) Functional framework and capabilities of the internet of things

 **URL:** <https://handle.itu.int/11.1002/1000/12419>

ABSTRACT: This recommendation provides the functional framework and associated capabilities of Internet of Things (IoT), in particular components of the functional framework, their capabilities, and the relationships among these components. The recommendation also describes the relationships between the IoT requirements specified in [ITU-T Y.IoT-common-reqts] and the capabilities specified in this Recommendation. Finally, the recommendation provides security considerations for the IoT functional framework.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-03

ITU-T Y.4412/F.747.8 (11/2015) Requirements and reference architecture for audience-selectable media service framework in the IoT environment

 **URL:** <https://handle.itu.int/11.1002/1000/12620>

ABSTRACT: This recommendation defines requirements and reference architecture for audience-selectable media (ASM) service in the IoT environment. The scope of this recommendation includes: a) Concept of ASM service framework; b) Requirements of ASM service framework; c) Reference architecture of ASM service framework; and, d) Functional entities of ASM service framework.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-11

ITU-T Y.4413/F.748.5 (11/2015) Requirements and reference architecture of M2M service layer

 **URL:** <https://handle.itu.int/11.1002/1000/12623>

ABSTRACT: The objective of this recommendation is to identify requirements of the M2M service layer, which are common to all M2M verticals or specific to e-health application support, and to provide an architectural framework of the M2M service layer. In particular, the scope of this recommendation includes: a) Definition of the M2M service layer; b) Requirements of the M2M service layer; c) Architectural framework of the M2M service layer; d) Reference points of the M2M service layer.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-11

ITU-T Y.4415 (06/2018) Architecture of web of objects based virtual home network

 **URL:** <https://handle.itu.int/11.1002/1000/13637>

ABSTRACT: This recommendation describes an architecture of a Web of Objects (WoO) based virtual home network (WVHN) by identifying the following: a) overview of WVHN; b) WVHN objects processing functions; c) WVHN service functions; d) security and trust support of WVHN.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-06

ITU-T Y.4416 Architecture of the Internet of Things based on next generation network evolution


 **URL:** <https://handle.itu.int/11.1002/1000/13638>

ABSTRACT: This Recommendation describes an architecture of the Internet of things (IoT) based on extensions and enhancement to next generation network evolution (NGNe) functional entities, reference points and components as described in [ITU-T Y.2012], and other related Recommendations. The Recommendation takes into account the IoT reference model specified in [ITU-T Y.4000], the IoT common requirements specified in [ITU-T Y.4100], and the IoT functional framework and capabilities specified in [ITU-T Y.4401].

The scope of this Recommendation includes:

- (1) the extension to NGNe functional entities to support the IoT;
- (2) the extension of NGNe reference points to support the IoT;
- (3) the extension of NGNe components to support the IoT;
- (4) the enhancement to NGNe capabilities to support the IoT.

Security of the extensions and enhancement specified in this Recommendation is also considered.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-06

ITU-T Y.4417 (06/2018) Framework of self-organization network in the IoT environments

 **URL:** <https://handle.itu.int/11.1002/1000/13639>

ABSTRACT: The scope of this recommendation includes: a) concept of self-organization network in the Internet of Things (IoT) environments; b) characteristics of self-organization network in the IoT environments; c) requirements for self-organization networking in IoT; d) functional architecture for self-organization networking in IoT.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-06

ITU-T Y.4452 (09/2016) IoT application support models of the Internet of Things


 **URL:** <https://handle.itu.int/11.1002/1000/13027>

ABSTRACT: This recommendation provides application support models of the Internet of Things (IoT). It includes the basis of IoT application support models; the configurable application support model, the adaptable application support model and the reliable application support model. The three application support models are described in functional view, implementation view and deployment view, in order to identify, respectively, the configurable capabilities, the adaptable capabilities and the reliable capabilities for support of IoT applications having some characteristic requirements.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-09

ITU-T Y.4453 Adaptive software framework for IoT devices

 **URL:** <https://handle.itu.int/11.1002/1000/13028>

ABSTRACT: This Recommendation describes the high-level requirements and functional architecture of the adaptive software framework (ASF) for Internet of things (IoT) devices..

In particular, the scope of this Recommendation includes:

- (1) an overview of the ASF,
- (2) features and high-level requirements of the ASF: monitoring capability, policy decision capability and management capability;
- (3) functional architecture of the ASF: application monitoring manager function, system information manager function and policy manager function.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2016-09

ITU-T Y.4553 Requirements of smartphone as sink node for IoT applications and services

🔗 URL: <https://handle.itu.int/11.1002/1000/12779>

ABSTRACT: This Recommendation specifies the common requirements of using the smartphone as sink node for IoT applications and services, while the smartphone could provide the functions of both end-user terminal as well as the mobile gateway to connect the mobile network and the sensor network. More specifically, this recommendation covers the followings:

- (1) Concept of IoT sink node of the IoT,
- (2) Sensing mode of the smartphone work as sink node for IoT applications and services,
- (3) Requirements of using smartphone as sink node for IoT applications and services

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2016-03

ITU-T Y.4702 (03/2016) Common requirements and capabilities of device management in IoT

🔗 URL: <https://handle.itu.int/11.1002/1000/12780>

ABSTRACT: This recommendation studies the requirements and capabilities of device management in IoT. The scope of this recommendation includes:

- a) the requirements of device management in IoT;
- b) the reference technical framework of device management in IoT;
- c) the capabilities of device management in IoT.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2016-03

ITU-T Y.4801/F.748.1 (10/2014) Requirements and common characteristics of IoT identifier for IoT service

🔗 URL: <https://handle.itu.int/11.1002/1000/12229>

ABSTRACT: The objective of this Recommendation is to analyse identifiers in existing technologies and networks for IoT service, and describe the requirements of IoT identifier, common characteristics of IoT identifier, and the general architecture of IoT identifier.

This Recommendation describes the requirements and common characteristics of IoT identifier for IoT service. The scope of this Recommendation includes:

- (1) Analysis of identifiers in existing technologies and networks;
- (2) Describe requirements of IoT identifier;
- (3) Describe common characteristics of IoT identifier;

(4) Describe the general architecture of IoT identifier.

🔗 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2014-10

NGI-Fed4Fire COMPUTATION OFFLOADING FOR IOT-ENABLED APPLICATIONS

🔗 URL: <https://www.fed4fire.eu/demo-stories/oc2/comfort-app/>

ABSTRACT: The COMFORT-APP project aims to provide an offloading mechanism for IoT-enabled applications. IoT devices have limited resources in terms of energy, computation and networking, thus the execution of computation intensive applications is still restrictive for them. MEC offers the processing power of cloud computing at the proximity of mobile users.

🔗 DOCUMENT TYPE: EU & National funded Open Source projects

📅 PUBLICATION DATE: Under develop-ment

NGI-Trust B-Smart

🔗 URL: <https://things.is/>

ABSTRACT: A human-centric interface, providing the best User Experience for managing privacy settings. One of the main issues related to the upcoming vision of the IoT is related to privacy: in particular, setting privacy controls. The B-Smart project addresses this from the user perspective.

🔗 DOCUMENT TYPE: EU & National funded Open Source projects

📅 PUBLICATION DATE: Under develop-ment

NGI-Trust D-SBOM (Distributed Software Bill of Materials)

🔗 URL: <https://www.trublo.eu/d-sbom/>

ABSTRACT: D-SBOM (Distributed Software Bills of Material) will provide a solution in complex IoT software supply chains to document all the software used in IoT devices and distribute this information in a secure and trusted way towards all users and actors.

🔗 DOCUMENT TYPE: EU & National funded Open Source projects

📅 PUBLICATION DATE: Under develop-ment

NGI-Trust PY 2.0

🔗 URL: <https://www.pyguard.fr/>

ABSTRACT: The PY 2.0 project aims to address issues by combining two emerging technologies known as edge AI and fog computing. The proposed solution will aggregate the data collected by the IoT devices into fog nodes and apply edge AI for data analysis at the edge of the infrastructure

🔗 DOCUMENT TYPE: EU & National funded Open Source projects

📅 PUBLICATION DATE: Under develop-ment

OGC 12-006 Sensor Observation Service

 **URL:** <https://www.ogc.org/standards/sos#overview>

ABSTRACT: The SOS standard is applicable to use cases in which sensor data needs to be managed in an interoperable way. This standard defines a Web service interface which allows querying observations, sensor metadata, as well as representations of observed features. Further, this standard defines means to register new sensors and to remove existing ones. Also, it defines operations to insert new sensor observations. This standard defines this functionality in a binding independent way; two bindings are specified in this document: a KVP binding and a SOAP binding.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2012-04

OGC 17-079r1 OGC SensorThings API Part 2 – Tasking Core

 **URL:** <http://docs.opengeospatial.org/is/17-079r1/17-079r1.html>

ABSTRACT: The OGC SensorThings API [OGC 15-078r6] provides an open, geospatial-enabled and unified way to interconnect the Internet of Things (IoT) devices, data, and applications over the Web. At a high level, the OGC SensorThings API provides two main functions and each function is handled by the Sensing part or the Tasking part. The Sensing part provides a standard way to manage and retrieve observations and metadata from heterogeneous IoT sensor systems. The Tasking part provides a standard way for parameterizing - also called tasking - of taskable IoT devices, such as individual sensors and actuators, composite consumer / commercial / industrial / smart cities in-situ platforms, mobile and wearable devices, or even unmanned systems platforms such as drones, satellites, connected and autonomous vehicles, etc. This document specifies core of the SensorThings Tasking part.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2019-01

OGC 18-088 OGC SensorThings API Part 1: Sensing Version 1.1

 **URL:** <https://docs.ogc.org/is/18-088/18-088.html>

ABSTRACT: The OGC SensorThings API provides an open, geospatial-enabled and unified way to interconnect the Internet of Things (IoT) devices, data, and applications over the web. At a high level the OGC SensorThings API provides two main functionalities and each function is handled by a part. The two parts are the Sensing part and the Tasking part. The Sensing part provides a standard way to manage and retrieve observations and metadata from heterogeneous IoT sensor systems. This document is version 1.1 and it is extending the first version of Sensing part.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-08

OMA IPSO Smart Object Guidelines

 **URL:** <https://omaspecworks.org/develop-with-oma-specworks/ipso-smart-objects/guidelines/>

ABSTRACT: IPSO Smart Object Guidelines provide a common design pattern, an object model, that can effectively use the IETF CoAP protocol to provide high level interoperability between Smart Object devices and connected software applications on other devices and services.

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** 2018-03

OMA IPSO Repo Public IPSO Repository

 **URL:** <https://technical.openmobilealliance.org/OMNA/LwM2M/LwM2MRegistry.html>

ABSTRACT: The IPSO Smart Object Registry registry is intended for developers that are building products based on IPSO Objects, it is not intended to be used at runtime by applications.

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** 2018-03

OMA ObjLwM2M_5GNR_Conn LIGHTWEIGHTM2M 5GNR CONNECTIVITY

 **URL:** https://www.openmobilealliance.org/release/ObjLwM2M_5GNR_Conn/V1_0-20201110-A/

ABSTRACT: Guideline for the support of LightweightM2M 5GNR Connectivity v1.0.

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** 2020-11

OMA ObjLwM2M_ACL LIGHTWEIGHTM2M ACCESS CONTROL

 **URL:** https://www.openmobilealliance.org/release/ObjLwM2M_ACL/V1_1-20201110-A/

ABSTRACT: Guideline for the support of LightweightM2M Access Control v1.1

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** 2020-11

OMA ObjLwM2M_APN_Conn LIGHTWEIGHTM2M APN CONNECTION PROFILE

 **URL:** https://www.openmobilealliance.org/release/ObjLwM2M_APN_Conn/V1_1-20201110-A/

ABSTRACT: Guideline for the support of LightweightM2M APN Connection Profile v1.1.

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** 2020-11

OMA ObjLwM2M_Bearer_Conn LIGHTWEIGHTM2M BEARER SELECTION

 **URL:** https://www.openmobilealliance.org/release/ObjLwM2M_Bearer_Conn/V1_1-20201110-A/

ABSTRACT: Guideline for the support of LightweightM2M Bearer Selection v1.1.

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** 2020-11

OMA ObjLwM2M_Cell_Conn LIGHTWEIGHTM2M CELLULAR CONNECTIVITY

 **URL:** https://www.openmobilealliance.org/release/ObjLwM2M_Cell_Conn/V1_1-20201110-A/

ABSTRACT: Guideline for the support of LightweightM2M Cellular Connectivity v1.1.

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** 2020-11

OMA ObjLwM2M_Conn_Mon LightweightM2M Connectivity Monitoring

 **URL:** https://www.openmobilealliance.org/release/ObjLwM2M_Conn_Mon/V1_3-20201110-A/

ABSTRACT: Guideline for the support of LightweightM2M Connectivity Monitoring v1.3.

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** 2020-11

OMA ObjLwM2M_Conn_Stat LightweightM2M Connectivity Statistics

 **URL:** https://www.openmobilealliance.org/release/ObjLwM2M_Conn_Stat/V1_0_5-20201110-A/

ABSTRACT: Guideline for the support of LightweightM2M Connectivity Statistics v1.0.5.

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** 2020-11

OMA ObjLwM2M_COSE LightweightM2M COSE

 **URL:** https://www.openmobilealliance.org/release/ObjLwM2M_COSE/V1_0-20201110-A/

ABSTRACT: Guideline for the support of LightweightM2M COSE v1.0.

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** 2020-11

OMA ObjLwM2M_Device LightweightM2M Device

 **URL:** https://www.openmobilealliance.org/release/ObjLwM2M_Device/V1_2-20201110-A/

ABSTRACT: Guideline for the support of LightweightM2M Device v1.2.

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** 2020-11

OMA ObjLwM2M_Firmware LightweightM2M Firmware Update

 **URL:** https://www.openmobilealliance.org/release/ObjLwM2M_Firmware/V1_1-20201110-A/

ABSTRACT: Guideline for the support of LightweightM2M Firmware Update v1.1.

📄 DOCUMENT TYPE: Guideline

📅 PUBLICATION DATE: 2020-11

OMA ObjLwM2M_Gateway LightweightM2M Gateway

🔗 URL: https://www.openmobilealliance.org/release/ObjLwM2M_Gateway/V1_0-20201110-A/

ABSTRACT: Guideline for the support of LightweightM2M Gateway v1.0.

📄 DOCUMENT TYPE: Guideline

📅 PUBLICATION DATE: 2020-11

OMA ObjLwM2M_Location LightweightM2M Location

🔗 URL: https://www.openmobilealliance.org/release/ObjLwM2M_Location/V1_0_3-20201110-A/

ABSTRACT: Guideline for the support of LightweightM2M Location v1.0.3.

📄 DOCUMENT TYPE: Guideline

📅 PUBLICATION DATE: 2020-11

OMA ObjLwM2M_MQTT_Server LightweightM2M MQTT Server

🔗 URL: https://www.openmobilealliance.org/release/ObjLwM2M_MQTT_Server/V1_0-20201110-A/

ABSTRACT: Guideline for the support of LightweightM2M MQTT Server v1.0.

📄 DOCUMENT TYPE: Guideline

📅 PUBLICATION DATE: 2020-11

OMA ObjLwM2M_OSCORE LightweightM2M OSCORE

🔗 URL: https://www.openmobilealliance.org/release/ObjLwM2M_OSCORE/V2_0-20211123-A/

ABSTRACT: Guideline for the support of SUP LightweightM2M OSCORE v2.0.

📄 DOCUMENT TYPE: Guideline

📅 PUBLICATION DATE: 2020-11

OMA ObjLwM2M_Routing LightweightM2M Routing

🔗 URL: https://www.openmobilealliance.org/release/ObjLwM2M_Routing/V1_0-20201110-A/

ABSTRACT: Guideline for the support of LightweightM2M Routing v1.0.

📄 DOCUMENT TYPE: Guideline

📅 PUBLICATION DATE: 2020-11

OMA ObjLwM2M_Security LightweightM2M Security

 **URL:** https://www.openmobilealliance.org/release/ObjLwM2M_Security/V1_2-20201110-A/

ABSTRACT: Guideline for the support of LightweightM2M Security v1.2.

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** 2020-11

OMA ObjLwM2M_Server LightweightM2M Server

 **URL:** https://www.openmobilealliance.org/release/ObjLwM2M_Server/V1_2-20201110-A/

ABSTRACT: Guideline for the support of LightweightM2M Server v1.2.

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** 2020-11

OMA ObjLwM2M_WLAN_Conn LightweightM2M WLAN Connectivity


 **URL:** https://www.openmobilealliance.org/release/ObjLwM2M_WLAN_Conn/V1_1-20201110-A/

ABSTRACT: Guideline for the support of LightweightM2M WLAN Connectivity v1.1.

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** 2020-11

oneM2M ETSI TR 118 502 V1.0.0 Architecture Part 1: Analysis of the architectures proposed for consideration


 **URL:** https://www.etsi.org/deliver/etsi_tr/118500_118599/118502/01.00.00_60/tr_118502v010000p.pdf

ABSTRACT: The present document provides an analysis and comparison of existing M2M-related Architecture work undertaken by the founding partners of oneM2M, including: the Association of Radio Industries and Businesses (ARIB) and the Telecommunication Technology Committee (TTC) of Japan; the Alliance for Telecommunications Industry Solutions (ATIS) and the Telecommunications Industry Association (TIA) of the USA; the China Communications Standards Association (CCSA); the European Telecommunications Standards Institute (ETSI); and the Telecommunications Technology Association (TTA) of Korea. In addition, architectural work by other non-oneM2M Partner Type 1 organizations is provided for consideration. The present document is intended to ensure a common understanding of existing M2M Architectural approaches, in order to facilitate future normative work resulting in oneM2M Technical Specifications (TS). The present document has been prepared under the auspices of the oneM2M Technical Plenary, by the oneM2M Architecture Working Group.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2015-04

oneM2M TR-0017-V2.0.0 Home Domain Abstract Information Model

 **URL:** https://onem2m.org/images/files/deliverables/Release2/TR-0017-Home_Domain_Abstract_Information_Model-V2_0_0.pdf

ABSTRACT: The present document allows application developers to describe the status of devices

as resources on oneM2M-based platform in various ways. Thus different application developers can create different resource trees even when they build the same kinds of applications. Moreover when handling the same kinds of devices from different vendors on M2M platforms, application developers may create disunited resource trees without common information model.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2016-8

oneM2M TR-0066-V-0.3.0 System Enhancement to Support Data License Management (DLM)

🔗 URL: <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=33583>

ABSTRACT: This document is analysing existing data license schemes and how these licenses are being used in existing data management platforms to understand essential functions to utilize data license in the oneM2M system. Based on the result of the technical report, it will identify potential requirements and key features to support data license management in the oneM2M system.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2021-04

oneM2M TS-0001-V4.14.0 Functional Architecture

🔗 URL: <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34648>

ABSTRACT: This document specifies the functional architecture for the oneM2M Services Platform.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2022-03

oneM2M TS-0012-V3.7.3 OneM2M Base Ontology

🔗 URL: https://www.onem2m.org/images/pdf/TS-0012-Base_Ontology-V3_7_3.pdf

ABSTRACT: oneM2M's Base Ontology constitutes a basis framework for specifying the

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2019-02

oneM2M TS-0034-V4.2.0 Semantics Support

🔗 URL: <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=31425>

ABSTRACT: This specification provides normative text for semantic enablement in oneM2M.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2020-08

Open Group Reference Architectures and Open Group Standards for the Internet of Things

 **URL:** <https://publications.opengroup.org/w16d>

ABSTRACT: The Internet of Things (IoT) is one of the new technological phenomena driving the current digital revolution, and addressed by the Open Platform 3.0™ Forum, a Forum of The Open Group. Networked sensors and controls will enable enterprises to provide new products and services, and improve their existing operations. This White Paper discusses how architects can use standards to define IoT systems and solutions, compares four leading and emerging standard IoT reference architectures, and explains the role of The Open Group IoT Standards

 **DOCUMENT TYPE:** Whitepaper

 **PUBLICATION DATE:** 2016-12

Open Group O-DF Open Data Format (O-DF), The Open Group Standard for the Internet of Things (IoT), Version 2.0

 **URL:** <https://publications.opengroup.org/c19d>

ABSTRACT: The Open Data Format (O-DF) standard is intended to represent information about things in a standardized way that can be understood and exchanged in a universal way by all information systems that need to manage IoT-related data. The O-DF standard can be used for publishing the available data using ordinary URL (Uniform Resource Locator) addresses. O-DF structures can also be used for requesting and sending published data between systems, notably when used together with The Open Group Open Messaging Interface (O-MI) standard.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2019-12

W3C Thing Description (TD) Ontology

 **URL:** <https://www.w3.org/2019/wot/td>

ABSTRACT: The Thing Description (TD) ontology is an RDF axiomatization of the TD information model, one of the building blocks of the Web of Things (WoT). Besides providing an alternative to the standard JSON representation format for TD documents, the TD ontology can also be used to process contextual information on Things and for alignments with other WoT-related ontologies.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2022-02

W3C DIDs Decentralized Identifiers (DIDs) v1.0 (2021)

 **URL:** www.w3.org/TR/did-core/

ABSTRACT: Data and Information Management, Security and Trustworthiness - Create identifiers that enable verifiable, decentralized digital identities in a multi-party setting.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-08

W3C JSON-LD 1.1 A JSON-based Serialization for Linked Data

 **URL:** www.w3.org/TR/json-ld11/

ABSTRACT: Data and Information Management - JSON is a data serialization and messaging format. This specification defines JSON-LD, a JSON-based format to serialize Linked Data. The syntax is designed to easily integrate into deployed systems that already use JSON, and provides a smooth upgrade path from JSON to JSON-LD. It is primarily intended to be a way to use Linked Data in Web-based programming environments, to build interoperable Web services, and to store Linked Data in JSON-based storage engines.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-07

W3C ODRL Information Model 2.2 Open Digital Rights Language (ODRL) Information Model 2.2

 **URL:** www.w3.org/TR/odrl-model/

ABSTRACT: Data and Information Management, Security and Trustworthiness - A policy expression language that provides a flexible and interoperable information model, vocabulary, and encoding mechanisms for representing statements about the usage of content and services. The ODRL Information Model describes the underlying concepts, entities, and relationships that form the foundational basis for the semantics of the ODRL policies.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-02

W3C OGC 16-079 W3C Semantic Sensor Network Ontology

 **URL:** <https://www.w3.org/TR/vocab-ssn/>

ABSTRACT: The Semantic Sensor Network (SSN) ontology is an ontology for describing sensors and their observations, the involved procedures, the studied features of interest, the samples used to do so, and the observed properties, as well as actuators. SSN follows a horizontal and vertical modularization architecture by including a lightweight but self-contained core ontology called SOSA (Sensor, Observation, Sample, and Actuator) for its elementary classes and properties. With their different scope and different degrees of axiomatization, SSN and SOSA are able to support a wide range of applications and use cases, including satellite imagery, large-scale scientific monitoring, industrial and household infrastructures, social sensing, citizen science, observation-driven ontology engineering, and the Web of Things. Both ontologies are described below, and examples of their usage are given.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-10

W3C RDF Resource Description Framework (RDF) v1.1 (2014)

 **URL:** www.w3.org/RDF/

ABSTRACT: Enterprise/Systems Integration, Data and Information Management, Analytics and AI - RDF is a standard model for data interchange on the Web. RDF has features that facilitate data merging even if the underlying schemas differ, and it specifically supports the evolution of schemas over time without requiring all the data consumers to be changed.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2014-02

W3C Verifiable Credentials Data Model v1.1 Verifiable Credentials Data Model v1.1 (2021)

 **URL:** www.w3.org/TR/vc-data-model/

ABSTRACT: Data and Information Management, Security and Trustworthiness - Create cryptographically secure, privacy respecting, and machine-verifiable credentials for establishing trust among different entities in a decentralized setting.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2022-03

■ Manufacturing

DIN/DKE DIN SPEC 16593-1 Reference Model for Industry 4.0 Service Architectures - Part 1: Basic Concepts of an Interaction-based Architecture

 **URL:** www.beuth.de/de/technische-regel/din-spec-16593-1/287632675

ABSTRACT: System Architecture - Concepts of component interaction in Plattform Industry 4.0.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-04

IEC 62541-10:2020 OPC Unified Architecture - Part 10: Programs

 **URL:** <https://webstore.iec.ch/publication/61119>

ABSTRACT: IEC 62541-10:2020 RLV contains both the official IEC International Standard and its Redline version. The Redline version is available in English only and provides you with a quick and easy way to compare all the changes between the official IEC Standard and its previous edition. IEC 62541-10:2020 defines the information model associated with Programs in the OPC Unified Architecture. This includes the description of the NodeClasses, standard Properties, Methods and Events and associated behaviour and information for Programs. The complete Address Space model including all NodeClasses and Attributes is specified in IEC 62541-3. The Services such as those used to invoke the Methods used to manage Programs are specified in IEC 62541 4. This third edition cancels and replaces the second edition published in 2015. This edition includes several clarifications and in addition the following significant technical changes with respect to the previous edition: a) Changed ProgramType to ProgramStateMachineType. This is in line with the NodeSet (and thus implementations). In ProgramDiagnosticDataType: changed the definition of lastInputArguments and lastOutputArguments and added two additional fields for the argument values. Also changed StatusResult into StatusCode. Created new version of the type to ProgramDiagnostic2DataType. b) Changed Optional modelling rule to OptionalPlaceholder for Program control Methods. Following the clarification in IEC 62541-3, this now allows subtypes (or instances) to add arguments.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-07-07

IEC 62541-100:2015 OPC Unified Architecture - Part 100: Device Interface

 **URL:** <https://webstore.iec.ch/publication/21987>

ABSTRACT: IEC 62541-100:2015 is an extension of the overall OPC Unified Architecture standard series and defines the information model associated with Devices. This part of IEC 62541 describes three models which build upon each other: (1) the (base) Device Model intended to provide a unified view of devices; (2) the Device Communication Model which adds Network and Connection information elements so that communication topologies can be created; (3) the Device Integration Host Model finally which adds additional elements and rules required for host systems to manage integration for a complete system. It allows reflecting the topology of the automation system with the devices as well as the connecting communication networks.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-03-25

IEC 62541-11:2020 OPC Unified Architecture - Part 11: Historical Access

 **URL:** <https://webstore.iec.ch/publication/61129>

ABSTRACT: IEC 62541-11:2020 which contains the International Standard and its Redline version, showing all changes of the technical content compared to the previous edition. IEC 62541-11:2020 is part of the OPC Unified Architecture standard series and defines the information model associated with Historical Access (HA). It particularly includes additional and complementary descriptions of the NodeClasses and Attributes needed for Historical Access, additional standard Properties, and other information and behaviour. The complete AddressSpace Model including all NodeClasses and Attributes is specified in IEC 62541-3. The predefined Information Model is defined in IEC 62541-5. The Services to detect and access historical data and events, and description of the ExtensibleParameter types are specified in IEC 62541-4. This document includes functionality to compute and return Aggregates like minimum, maximum, average etc. The Information Model and the concrete working of Aggregates are defined in IEC 62541-13. This third edition cancels and replaces the second edition published in 2015. This edition constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous edition: a) a new method for determining the first historical point has been added; b) added clarifications on how to add, insert, modify, and delete annotations.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-06-23

IEC 62541-13:2020 OPC Unified Architecture - Part 13: Aggregates

 **URL:** <https://webstore.iec.ch/publication/61131>

ABSTRACT: IEC 62541-13:2020 contains both the official IEC International Standard and its Redline version. The Redline version is available in English only and provides you with a quick and easy way to compare all the changes between the official IEC Standard and its previous edition. IEC 62541-13:2020 is part of the overall OPC Unified Architecture specification series and defines the information model associated with Aggregates. This second edition cancels and replaces the first edition of IEC 62541-13, published in 2015. No technical changes but numerous clarifications. Also some corrections to the examples.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-06-11

IEC 62541-14:2020 OPC Unified Architecture - Part 14: PubSub

 **URL:** <https://webstore.iec.ch/publication/61108>

ABSTRACT: IEC 62541-14:2020 defines the OPC Unified Architecture (OPC UA) PubSub communication model. It defines an OPC UA publish subscribe pattern which complements the client server pattern defined by the Services in IEC 62541-4. IEC TR 62541-1 gives an overview of the two models and their distinct uses. PubSub allows the distribution of data and events from an OPC UA information source to interested observers inside a device network as well as in IT and analytics cloud systems. This document consists of a) a general introduction of the PubSub concepts, b) a definition of the PubSub configuration parameters, c) mapping of PubSub concepts and configuration parameters to messages and transport protocols, and d) a PubSub configuration model. Not all OPC UA Applications will need to implement all defined message and transport protocol mappings. IEC 62541-7 defines the Profile that dictates which mappings need to be implemented in order to be compliant with a particular Profile.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-07-08

IEC 62541-3:2020 OPC Unified Architecture - Part 3: Address Space Model

 **URL:** <https://webstore.iec.ch/publication/61112>

ABSTRACT: IEC 62541-3:2020 RLV contains both the official IEC International Standard and its Redline version. The Redline version is available in English only and provides you with a quick and easy way to compare all the changes between the official IEC Standard and its previous edition. IEC 62541-3:2020 defines the OPC Unified Architecture (OPC UA) AddressSpace and its Objects. This document is the OPC UA meta model on which OPC UA information models are based. This third edition cancels and replaces the second edition published in 2015. This edition includes the following significant technical changes with respect to the previous edition: a) Added new improved approach for exposing structure definitions. An Attribute on the DataType Node now simply contains a binary description. b) Added new flags for Variables to indicate atomicity when reading or writing. c) Added Roles and Permissions to allow configuration of a role-based authorization. d) Added new data types: "Union", "Decimal", "OptionSet", "DateString", "TimeString", "DurationString", "NormalizedString", "DecimalString", and "AudioDataType". e) Added definition on how to use the ModellingRules OptionalPlaceHolder and MandatoryPlaceHolder for Methods. f) Added optional Properties "MaxCharacters" and "MaxByteStringLength" to Variable Nodes.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-07-08

IEC 62541-4:2020 OPC Unified Architecture - Part 4: Services

 **URL:** <https://webstore.iec.ch/publication/61113>

ABSTRACT: IEC 62541-4:2020 RLV contains both the official IEC International Standard and its Redline version. The Redline version is available in English only and provides you with a quick and easy way to compare all the changes between the official IEC Standard and its previous edition. IEC 62541-4:2020 defines the OPC Unified Architecture (OPC UA) Services. The Services defined are the collection of abstract Remote Procedure Calls (RPC) that are implemented by OPC UA Servers and called by OPC UA Clients. All interactions between OPC UA Clients and Servers occur via these Services. The defined Services are considered abstract because no particular RPC mechanism for implementation is defined in this document. IEC 62541-6 specifies one or more concrete mappings supported for implementation. For example, one mapping in IEC 62541-6 is to XML Web Services. In that case the Services described in this document appear as the Web service methods in the WSDL contract. Not all OPC UA Servers will need to implement all of the defined Services. IEC 62541-7 defines the Profiles that dictate which Services need to be implemented in order to be compliant with a particular Profile. This third edition cancels and replaces the second edition published in 2015. This edition constitutes

a technical revision. This edition includes the following significant technical changes with respect to the previous edition:

- a) Added ability to resend all data of monitored items in a Subscription using the ResendData Method.
- b) Added support for durable Subscriptions (lifetime of hours or days).
- c) Added Register2 and FindServersOnNetwork Services to support network-wide discovery using capability filters.
- d) Removed definition of software certificates. Will be defined in a future edition.
- e) Extended and partially revised the redundancy definition. Added sub-range definitions for ServiceLevel and added more terms for redundancy.
- f) Added a section on how to use Authorization Services to request user access tokens.
- g) Added JSON Web Tokens (JWTs) as a new user token.
- h) Added the concept of session-less service invocation.
- i) Added a generic structure that allows passing any number of attributes to the AddNodes Service.
- j) Added requirement to protect against user identity token attacks.
- k) Added new EncryptedSecret format for user identity tokens.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2020-07-13

IEC 62541-5:2020 OPC Unified Architecture - Part 5: Information Model

🔗 URL: <https://webstore.iec.ch/publication/61114>

ABSTRACT: IEC 62541-5:2020 which contains the International Standard and its Redline version, showing all changes of the technical content compared to the previous edition. IEC 62541-5:2020 defines the Information Model of the OPC Unified Architecture. The Information Model describes standardized Nodes of a Server's AddressSpace. These Nodes are standardized types as well as standardized instances used for diagnostics or as entry points to server-specific Nodes. Thus, the Information Model defines the AddressSpace of an empty OPC UA Server. However, it is not expected that all Servers will provide all of these Nodes. This third edition cancels and replaces the second edition published in 2015. This edition constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous edition:

- a) Added Annex F on User Authentication. Describes the Role Information Model that also allows configuration of Roles.
- b) Added new data types: "Union", "Decimal", "OptionSet", "DateString", "TimeString", "DurationString", "NormalizedString", "DecimalString", and "AudioDataType".
- c) Added Method to request a state change in a Server.
- d) Added Method to set Subscription to persistent mode.
- e) Added Method to request resending of data from a Subscription.
- f) Added concept allowing to temporarily create a file to write to or read from a server in C.4.
- g) Added new Variable type to support Selection Lists.
- h) Added optional properties to FiniteStateMachineType to expose currently available states and transitions.
- i) Added UrisVersion Property to ServerType. This version information can be used for session-less service invocation.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2020-07-10

IEC 62541-6:2020 OPC Unified Architecture - Part 6: Mappings

 **URL:** <https://webstore.iec.ch/publication/61115>

ABSTRACT: IEC 62541-6:2020 which contains the International Standard and its Redline version, showing all changes of the technical content compared to the previous edition. IEC 62541-6:2020 specifies the OPC Unified Architecture (OPC UA) mapping between the security model described in IEC TR 62541-2, the abstract service definitions specified in IEC 62541-4, the data structures defined in IEC 62541-5 and the physical network protocols that can be used to implement the OPC UA specification. This third edition cancels and replaces the second edition published in 2015. This edition constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous edition:

a) Encodings:

- (1) added JSON encoding for PubSub (non-reversible);
- (2) added JSON encoding for Client/Server (reversible);
- (3) added support for optional fields in structures;
- (4) added support for Unions.

b) Transport mappings:

- (1) added WebSocket secure connection – WSS;
- (2) added support for reverse connectivity;
- (3) added support for session-less service invocation in HTTPS.

c) DeprecatedTransport (missing support on most platforms): SOAP/HTTP with WS-SecureConversation (all encodings).

d) Added mapping for JSON Web Token.

e) Added support for Unions to NodeSet Schema.

f) Added batch operations to add/delete nodes to/from NodeSet Schema.

g) Added support for multi-dimensional arrays outside of Variants.

h) Added binary representation for Decimal data types.

i) Added mapping for an OAuth2 Authorization Framework.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-07-13

IEC 62541-7:2020 OPC Unified Architecture - Part 7: Profiles

 **URL:** <https://webstore.iec.ch/publication/61116>

ABSTRACT: IEC 62541-7:2020 which contains the International Standard and its Redline version, showing all changes of the technical content compared to the previous edition. IEC 62541-7:2020 defines the OPC Unified Architecture (OPC UA) Profiles. The Profiles in this document are used to segregate features with regard to testing of OPC UA products and the nature of the testing (tool based or lab based). This includes the testing performed by the OPC Foundation provided OPC UA CTT (a self-test tool) and by the OPC Foundation provided Independent certification test labs. This could equally as well refer to test tools provided by another organization or a test lab provided by another organization. What is important is the concept of automated tool-based testing versus lab-based testing. The scope of this standard includes defining functionality that can only be tested in a lab and defining the grouping of functionality that is to be used when testing OPC UA products either in a lab or using automated tools. The definition of actual TestCases is not within the scope of this document, but the general categories of TestCases are within the scope of this document. Most OPC UA applications will conform to several, but not all, of the Profiles. This third edition cancels and replaces the second edition published in 2015. This edition constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous edition:

a) new functional Profiles:

- (1) profiles for global discovery and global certificate management;
- (2) profiles for global KeyCredential management and global access token management;

- (3) facet for durable subscriptions;
 - (4) standard UA Client Profile;
 - (5) profiles for administration of user roles and permissions.
- b) new transport Profiles:
- (1) HTTPS with JSON encoding;
 - (2) secure WebSockets (WSS) with binary or JSON encoding;
 - (3) reverse connectivity.
- c) new security Profiles:
- (1) transportSecurity – TLS 1.2 with PFS (with perfect forward secrecy);
 - (2) securityPolicy [A] – Aes128-Sha256-RsaOaep (replaces Base128Rsa15);
 - (3) securityPolicy – Aes256-Sha256-RsaPss adds perfect forward secrecy for UA TCP);
 - (4) user Token JWT (Jason Web Token).
- d) deprecated Security Profiles (due to broken algorithms):
- (1) securityPolicy – Basic128Rsa15 (broken algorithm Sha1);
 - (2) securityPolicy – Basic256 (broken algorithm Sha1);
 - (3) transportSecurity – TLS 1.0 (broken algorithm RC4);
 - (4) transportSecurity – TLS 1.1 (broken algorithm RC4).
- e) deprecatedTransport (missing support on most platforms): SOAP/HTTP with WS-SecureConversation (all encodings).

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2020-06-22

IEC 62541-8:2020 OPC Unified Architecture - Part 8: Data Access

🔗 URL: <https://webstore.iec.ch/publication/61117>

ABSTRACT: IEC 62541-8:2020 which contains the International Standard and its Redline version, showing all changes of the technical content compared to the previous edition. IEC 62541-8:2020 is part of the overall OPC Unified Architecture (OPC UA) standard series and defines the information model associated with Data Access (DA). It particularly includes additional VariableTypes and complementary descriptions of the NodeClasses and Attributes needed for Data Access, additional Properties, and other information and behaviour. The complete address space model, including all NodeClasses and Attributes is specified in IEC 62541-3. The services to detect and access data are specified in IEC 62541-4. This third edition cancels and replaces the second edition published in 2015. This edition constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous edition: a) added new VariableTypes for AnalogItems; b) added an Annex that specifies a recommended mapping of OPC UA DataAccess to OPC COM DataAccess; c) changed the ambiguous description of “Bad_NotConnected”; d) updated description for EUInformation to refer to latest revision of UNCEFACT units.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2020-06-22

IEC 62541-9:2020 OPC Unified Architecture - Part 9: Alarms and Conditions

🔗 URL: <https://webstore.iec.ch/publication/61118>

ABSTRACT: IEC 62541-9:2020 contains both the official IEC International Standard and its Redline version. The Redline version is available in English only and provides you with a quick and easy way to compare all the changes between the official IEC Standard and its previous edition. IEC 62541-9:2020 specifies the representation of Alarms and Conditions in the OPC Unified Architecture. Included is the Information Model representation of Alarms and Conditions in the OPC UA address space. Other

aspects of alarm systems such as alarm philosophy, life cycle, alarm response times, alarm types and many other details are captured in documents such as IEC 62682 and ISA 18.2. The Alarms and Conditions Information Model in this specification is designed in accordance with IEC 62682 and ISA 18.2. This third edition cancels and replaces the second edition published in 2015. This edition constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous edition: a) added optional engineering units to the definition of RateOfChange alarms; b) to fulfill the IEC 62682 model, the following elements have been added: - AlarmConditionType States: Suppression, Silence, OutOfService, Latched; - AlarmConditionType Properties: OnDelay, OffDelay, FirstInGroup, ReAlarmTime; - New alarm types: DiscrepancyAlarm, DeviationAlarm, InstrumentDiagnosticAlarm, SystemDiagnosticAlarm. c) added Annex that specifies how the concepts of this OPC UA part maps to IEC 62682 and ISA 18.2; d) added new ConditionClasses: Safety, HighlyManaged, Statistical, Testing, Training; e) added CertificateExpiration AlarmType; f) added Alarm Metrics model.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2020-06-18

IEC 62714-1:2018 Engineering data exchange format for use in industrial automation systems engineering - Automation Markup Language - Part 1: Architecture and general requirements

🔗 URL: <https://webstore.iec.ch/publication/32339>

ABSTRACT: IEC 62714-1:2018 RLV contains both the official IEC International Standard and its Redline version. The Redline version is available in English only and provides you with a quick and easy way to compare all the changes between the official IEC Standard and its previous edition. IEC 62714-1:2018 is a solution for data exchange focusing on the domain of automation engineering. The data exchange format defined in the IEC 62714 series (Automation Markup Language, AML) is an XML schema based data format and has been developed in order to support the data exchange in a heterogeneous engineering tools landscape. The goal of AML is to interconnect engineering tools in their different disciplines, e.g. mechanical plant engineering, electrical design, process engineering, process control engineering, HMI development, PLC programming, robot programming, etc. This second edition cancels and replaces the first edition published in 2014. This edition constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous edition:

- a) use of CAEX 3.0 according to IEC 62424:2016
- b) improved modelling of references to documents outside of the scope of the present standard,
- c) modelling of references between CAEX attributes and items in external documents,
- d) revised role libraries,
- e) modified Port concept,
- f) modelling of multilingual expressions,
- g) modelling of structured attribute lists or array,
- h) a new AML container format,
- i) a new standard AML attribute library.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2018-04-30

IEC 62714-2:2015 Engineering data exchange format for use in industrial automation systems engineering - Automation markup language - Part 2: Role class libraries

🔗 URL: <https://webstore.iec.ch/publication/22030>

ABSTRACT: IEC 62714-2:2015 specifies normative as well as informative AML role class libraries for the modelling of engineering information for the exchange between engineering tools in the plant automation area by means of AML. Moreover, it presents additional user defined libraries as an

example. Its provisions apply to the export/import applications of related tools.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2015-03-30

IEC 62714-3:2017 Engineering data exchange format for use in industrial automation systems engineering - Automation markup language - Part 3: Geometry and kinematics

🔗 URL: <https://webstore.iec.ch/publication/34158>

ABSTRACT: IEC 62714-3:2017 specifies the integration of geometry and kinematics information for the exchange between engineering tools in the plant automation area by means of AML.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2017-01-25

IEC 62714-4:2020 Engineering data exchange format for use in industrial automation systems engineering - Automation markup language - Part 4: Logic

🔗 URL: <https://webstore.iec.ch/publication/28979>

ABSTRACT: IEC 62714-4:2020 specifies the integration of logic information as part of an AML model for the data exchange in a heterogenous engineering tool landscape of production systems. This document specifies three types of logic information: sequencing, behaviour, and interlocking information. This document deals with the six following sequencing and behaviour logic models (covering the different phases of the engineering process of production systems) and how they are integrated in AML: Gantt chart, activity-on-node network, timing diagram, Sequential Function Chart (SFC), Function Block Diagram (FBD), and mathematical expression. This document specifies how to model Gantt chart, activity-on-node network, and timing diagram and how they are stored in Intermediate Modelling Layer (IML). This document specifies how interlocking information is modelled (as interlocking source and target groups) in AML. The interlocking logic model is stored in Function Block Diagram (FBD). This document specifies the AML logic XML schema that stores the logic models by using IEC 61131-10. This document specifies how to reference PLC programs stored in PLCopen XML documents. This document does not define details of the data exchange procedure or implementation requirements for the import/export tools. The contents of the corrigendum of November 2020 have been included in this copy.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2020-06-16

IEC 62714-5:2022 Engineering data exchange format for use in industrial automation systems engineering - Automation markup language - Part 5: Communication


🔗 URL: <https://webstore.iec.ch/publication/65493>

ABSTRACT: IEC 62714-5:2022 Engineering processes of technical systems and their embedded automation systems are executed with increasing efficiency and quality. Especially since the project duration tends to increase as the complexity of the engineered system increases. To solve this problem, the engineering process is more often being executed by exploiting software based engineering tools exchanging engineering information and artefacts along the engineering process related tool chain.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2022-03-11

IEC 63365 ED1 Digital Nameplate – Digital Product Marking

 **URL:** https://www.iec.ch/ords/f?p=103:38:401030832849310:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:1452,23,104515

ABSTRACT: This document focuses on the specification of the digital nameplate and is Under development.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under development

IEC TR 62541-1:2020 OPC Unified Architecture - Part 1: Overview and concepts

 **URL:** <https://webstore.iec.ch/publication/61109>

ABSTRACT: IEC TR 62541-1:2020 which contains the International Standard and its Redline version, showing all changes of the technical content compared to the previous edition. IEC 62541-1:2020 presents the concepts and overview of the OPC Unified Architecture (OPC UA). Reading this document is helpful to understand the remaining parts of this multi-part document set. Each of the other parts of IEC 62451 is briefly explained along with a suggested reading order.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2020-11-18

IHE (Integrating the Healthcare Enterprise) Patient Care Device (PCD) Profiles

 **URL:** https://wiki.ihe.net/index.php?title=PCD_Profiles

ABSTRACT: System Architecture, Communications/Networking, Data and Information Management - The IHE PCD develops standards-based interoperability profiles that address specific integration problems within the domain charter.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** N/A

ISO/IEC 30161:2020 Internet of things (IoT) - Data exchange platform for IoT services - Part 1: General requirements and architecture


 **URL:** <https://webstore.iec.ch/publication/63404>

ABSTRACT: ISO/IEC 30161-1:2020(E) specifies requirements for an Internet of Things (IoT) data exchange platform for various services in the technology areas of: a) the middleware components of communication networks allowing the co-existence of IoT services with legacy services; b) the end-points performance across the communication networks among the IoT and legacy services; c) the IoT specific functions and functionalities allowing the efficient deployment of IoT services; d) the IoT service communication networks' framework and infrastructure; and e) the IoT service implementation guideline for the IoT data exchange platform.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-11

C2CCC_RS_2035 Objectives


 **URL:** https://www.car-2-car.org/fileadmin/documents/Basic_System_Profile/Release_1.6.1/C2CCC_RS_2035_Objectives.pdf

ABSTRACT: The wide scope of the Cooperative Intelligent Transport Systems (C-ITS) definition affects all parts of traffic and thus involves many different stakeholders. This set of stakeholders may also comprise international entities or Standards Developing Organizations (SDO) of different nations. The primary objective of the C2C-CC (Car 2 Car – Communication Consortium) is to ensure interoperability in field of C-ITS between different vehicle manufacturers. This document provides objectives regarding C-ITS from C2C-CC point of view. They focus on vehicles but can be applied to other traffic participants too. In terms of C2C-CC, an objective is defined as an abstract requirement without any further specification about its details.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-12

C2CCC_RS_2036 Features

 **URL:** https://www.car-2-car.org/fileadmin/documents/Basic_System_Profile/Release_1.6.1/C2CCC_RS_2036_Features.pdf

ABSTRACT: Within the open system architecture of Cooperative Intelligent Transport System (C-ITS) four types of participants, called sub-systems, are identified in ETSI EN 302 665: vehicle, roadside, personal, and central. Each of these sub-systems includes a C-ITS station, but based on their sub-system specific equipment they enable different features. As a result of their feature list and their role in traffic, for each sub-system a set of use cases becomes possible to improve road safety and traffic efficiency. This document provides all features in scope of a vehicle sub-system from C2C-CC point of view. This set of features is the consolidated and communicated understanding of the core vehicle system features in a vehicle C-ITS station. The list in this document focuses on specifying the vehicle C-ITS station transmitting side. Moreover, this set is oriented towards enabling the vehicle use cases as included in the current C2C-CC release. Features themselves are detailed by one or more requirements. A feature can be assumed as tested if all requirements which detail this feature are tested.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-12

CEN EN 16157-1:2018 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 1: Context and framework

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:62523&cs=15997C7BB19A97A296D8A7719196409AD

ABSTRACT: This document specifies and defines components required to support the exchange and shared use of data and information in the field of traffic and travel. The components include the framework and context for the modelling approach, data content, data structure and relationships. This document is applicable to: - traffic and travel information which is of relevance to road networks (non-urban and urban), - public transport information that is of direct relevance to the use of a road network (e.g. road link via train or ferry service), - traffic and travel information in the case of Cooperative intelligent transport systems (C-ITS). This document establishes specifications for data exchange between any two instances of the following actors:

(1) Traffic Information Centres (TICs),

- (2) Traffic Control Centres (TCCs),
- (3) Service Providers (SPs).

Note that the use of this document can be applicable for use by other actors. This document covers, at least, the following types of informational content:

- (1) road traffic event information - planned and unplanned occurrences both on the road network and in the surrounding environment,
- (2) information about operator-initiated actions - including both advisory and mandatory measures,
- (3) road traffic measurement data, status data, and travel time data,
- (4) travel information relevant to road users, including weather and environmental information,
- (5) road traffic management information and information and advice relating to use of the road network.

This part of EN 16157 specifies the DATEX II framework of all parts of this European Standard, the context of use and the modelling approach taken and used throughout this European Standard. This approach is described using formal methods and provides the mandatory reference framework for all other parts.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2018-12

CEN EN 16157-2:2019 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 2: Location referencing

🔗 URL: https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:60747&cs=1C3A140087AD1FDE865115EA876607C93

ABSTRACT: This European Standard series (EN 16157) specifies and defines component facets supporting the exchange and shared use of data and information in the field of traffic and travel. The component facets include the framework and context for exchanges, the modelling approach, data content, data structure and relationships. This European Standard series is applicable to:

- (1) traffic and travel information which is of relevance to road networks (non-urban and urban), - public transport information that is of direct relevance to the use of a road network (e.g. road link via train or ferry service),
- (2) traffic and travel information in the case of Cooperative intelligent transport systems (C-ITS).

This European Standard series establishes specifications for data exchange between any two instances of the following actors:

- (1) Traffic Information Centres (TICs),
- (2) Traffic Control Centres (TCCs),
- (3) Service Providers (SPs). Use of this European Standard series may be applicable for use by other actors.

This European Standard series covers, at least, the following types of informational content:

- (1) road traffic event information – planned and unplanned occurrences both on the road network and in the surrounding environment,
- (2) operator initiated actions,
- (3) road traffic measurement data, status data, and travel time data,
- (4) travel information relevant to road users, including weather and environmental information, (
- 5) road traffic management information and instructions relating to use of the road network.

This part of the EN 16157 series specifies the informational structures, relationships, roles, attributes and associated data types, for the implementation of the location referencing systems used in association with the different publications defined in the DATEX II framework. It also defines a DATEX II publication for exchanging predefined locations. This is part of the DATEX II platform independent data model.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2019-03

CEN EN 16157-3:2018 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 3: Situation Publication

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:60748&cs=13B159A7784936BDC97A42AFA8C21211A

ABSTRACT: This document specifies and defines component facets supporting the exchange and shared use of data and information in the field of traffic and travel. The component facets include the framework and context for exchanges, the modelling approach, data content, data structure and relationships. This document is applicable to:

- (1) traffic and travel information which is of relevance to road networks (non-urban and urban),
- (2) public transport information that is of direct relevance to the use of a road network (e.g. road link via train or ferry service),
- (3) traffic and travel information in the case of Cooperative intelligent transport systems (C-ITS).

This document establishes specifications for data exchange between any two instances of the following actors:

- (1) Traffic Information Centres (TICs),
- (2) Traffic Control Centres (TCCs),
- (3) Service Providers (SPs). Note that the use of this document can be applicable for use by other actors.

This document covers, at least, the following types of informational content: (

- 1) road traffic event information - planned and unplanned occurrences both on the road network and in the surrounding environment,
- (2) operator-initiated actions,
- (3) road traffic measurement data, status data, and travel time data,
- (4) travel information relevant to road users, including weather and environmental information,
- (5) road traffic management information and instructions relating to use of the road network.

This document specifies the informational structures, relationships, roles, attributes and associated data types required for publishing situation traffic and travel information within the DATEX II framework. This is specified as a DATEX II Situation Publication sub-model which is part of the DATEX II platform independent model, but this part excludes those elements that relate to:

- (1) location information which are specified in FprEN 16157 2;
- (2) common information elements, which are specified in EN 16157 7.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-12

CEN EN 16157-4:2021 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 4: VMS publication

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:68227&cs=19CD8A5DF8D8A747A2648590BAC670053

ABSTRACT: This European Standard (EN 16157 series) specifies and defines component facets supporting the exchange and shared use of data and information in the field of traffic and travel. The component facets include the framework and context for exchanges, the modelling approach, data content, data structure and relationships. This European Standard is applicable to:

- (1) Traffic and travel information which is of relevance to road networks (non-urban and urban),
- (2) Public transport information that is of direct relevance to the use of a road network (e.g. road link via train or ferry service),
- (3) Traffic and travel information in the case of Cooperative intelligent transport systems (C-ITS).

This European Standard establishes specifications for data exchange between any two instances of the following actors:

- (1) Traffic Information Centres (TICs),
- (2) Traffic Control Centres (TCCs),
- (3) Service Providers (SPs). Note that the use of this European Standard may be applicable for use by other actors.

This European Standard series covers, at least, the following types of informational content:

- (1) Road traffic event information – planned and unplanned occurrences both on the road network and in the surrounding environment,
- (2) Operator initiated actions,
- (3) Road traffic measurement data, status data, and travel time data,
- (4) Travel information relevant to road users, including weather and environmental information,
- (5) Road traffic management information and instructions relating to use of the road network.

This part of the CEN/TS 16157 series specifies the informational structures, relationships, roles, attributes and associated data types required for publishing variable message sign information within the DateX II framework. This is specified in two publications, a DATEX II VMS Table Publication sub-model and a VMS Publication sub-model, which are part of the DATEX II platform independent model, but this part excludes those elements that relate to:

- (1) location information which are specified in EN 16157-2, - common information elements, which are specified in EN 16157-7,
- (2) situation information which are specified in EN 16157-3.

The VMS Table Publication supports the occasional exchange of tables containing generally static reference information about deployed VMS which enable subsequent efficient references to be made to pre-defined static information relating to those VMS. The VMS Publication supports the exchange of the graphic and textual content of one or several VMS plus any status information on device configuration that aid the comprehension of the informational content. This content is potentially subject to rapid change. These publications are not intended to support the control or configuration of VMS equipment. Each is part of the DATEX II platform independent model.

🔗 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2021-03

CEN EN 16157-5:2020 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 5: Measured and elaborated data publications

🔗 URL: https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:68225&cs=15C7361EFFF209FF289AF2AAE0FBC17A1

ABSTRACT: This document is the fifth part of the DATEX II European Standard which deals with the publication sub-models within the DATEX II model that support the exchange of measured and elaborated information. These publications are intended to support the exchange of informational content from the organization having the measured data and creating elaborated data to other organisations providing ITS services or onward information exchange. It also includes the exchange of static information about measurement sites. This is specified in three sub-models, a DATEX II Measurement Site Table Publication sub-model, a DATEX II Measured Data Publication sub-model and a DATEX II Elaborated Data Publication sub-model.

🔗 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2020-08

CEN EN 1 6157-7:2018 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 7: Common data elements

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:62524&cs=14AD3FDA01670AAB7137D7857613CB12B


ABSTRACT: This document specifies and defines component facets required to support the exchange and shared use of data and information in the field of traffic and travel. The component facets include the framework and context for data content, data structure and relationships, communications specification. This document is applicable to: - traffic and travel information which is of relevance to road networks (non-urban and urban), - public transport information that is of direct relevance to the use of a road network (e.g. road link via train or ferry service), - traffic and travel information in the case of Cooperative intelligent transport systems (C-ITS). This document establishes specifications for data exchange between any two instances of the following actors:

- (1) Traffic Information Centres (TICs),
- (2) Traffic Control Centres (TCCs),

This document covers, at least, the following types of informational content:

- (1) road traffic event information - planned and unplanned occurrences both on the road network and in the surrounding environment,
- (2) information about operator initiated actions - including both advisory and mandatory measures,
- (3) road traffic measurement data, status data, and travel time data,
- (4) travel information relevant to road users, including weather and environmental information,
- (5) road traffic management information and information and advice relating to use of the road network.

This part of EN 16157 specifies common informational structures, relationships, roles, attributes and associated data types required for publishing information within the DATEX II framework. This is specified as a DATEX II sub-model which is part of the DATEX II platform independent model, but this part only covers common elements that are used by more than one publication. It excludes those elements that relate to location information which are specified in FprEN 16157 2.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-12

CEN CEN/TS 16157-6:2022 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 6: Parking publications

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT,FSP_LANG_ID:69724,25&cs=1451A03D2D2D1D87355F1559FEB7FA425

ABSTRACT: This new work item will revise and extend the sixth part of the DATEX II Technical Specifications which defines three DATEX II parking-related publications and a truck parking profile and that supports the exchange of static as well as dynamic information about parking facilities and areas, including intelligent truck parking as defined by the Directive 2010/40/EU priority action e as well as urban parking as specified in action a. The formerly used Level B extension will be replaced by a new namespace in the context of version 3.0 of DATEX II. The publications are intended to support the exchange of informational content from the organisation performing measurements and collecting/eliciting basic data to other organisations providing ITS services or onward information exchange. It is the ambition to harmonise existing information models from different sources such as EasyWay deployment guidelines and truck parking initiatives, and to liaise with the stakeholders involved, especially with the Alliance for Parking Data Standards and CEN/TC 278 working group 3.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2022-07

CEN ISO/TS 19468:2022 Intelligent transport systems - Data interfaces between centres for transport information and control systems - Platform-independent model specifications for data exchange protocols for transport information and control systems

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:71962&cs=18889333092FF2E127C49B472E09BA2FB

ABSTRACT: This document defines and specifies component facets supporting the exchange and shared usage of data and information in the field of traffic and travel. The component facets include the framework and context for exchanges, the data content, structure and relationships necessary and the communications specifications, in such a way that they are independent from any defined technical platform. This document establishes specifications for data exchange between any two instances of the following actors:

- (1) Traffic information centres (TICs);
- (2) Traffic control centres/Traffic management centres (TCCs/TMCs); (3) Service providers (SPs). This document can also be applied for use by other actors, e.g. car park operators.

This document includes the following types of information:

- (1) use cases and associated requirements, and features relative to different exchange situations;
- (2) different functional exchange profiles;
- (3) abstract elements for protocols;
- (4) data model for exchange (informational structures, relationships, roles, attributes and associated data types required).

In order to set up a new technical exchange framework, it is necessary to associate one functional exchange profile with a technical platform providing an interoperability domain where plug-and-play interoperability at a technical level can be expected. The definition of such interoperability domains is out of scope of this document but can be found in other International Standards or Technical Specifications (e.g. the ISO 14827 series). This document is restricted to data exchange. Definition of payload content models is out of the scope of this document.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2022-02

CEN/TS 16157-10:2022 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 10: Energy infrastructure publications

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:71189&cs=17CE8E7FC7390CF7CC48C34700D0A825D

ABSTRACT: The EN 16157 series specifies and defines component facets supporting the exchange and shared use of data and information in the field of traffic and travel. The component facets include the framework and context for exchanges, the modelling approach, data content, data structure and relationships. The EN 16157 series is applicable to:

- (1) traffic and travel information which is of relevance to road networks (non-urban and urban); (2) public transport information that is of direct relevance to the use of a road network (e.g. road link via train or ferry service);
- (3) traffic and travel information in the case of Cooperative intelligent transport systems (C-ITS).

This series establishes specifications for data exchange between any two instances of the following actors:

- (1) Traffic Information Centres (TICs);
- (2) Traffic Control Centres (TCCs);
- (3) Service Providers (SPs). Note that the use of this series can be applicable for use by other actors.

This series covers, at least, the following types of informational content:

- (1) road traffic event information – planned and unplanned occurrences both on the road network and in the surrounding environment;
- (2) operator initiated actions;
- (3) road traffic measurement data, status data, and travel time data;
- (4) travel information relevant to road users, including weather and environmental information;
- (5) road traffic management information and instructions relating to use of the road network.

This part of the CEN/TS 16157 series specifies details of infrastructure for vehicle energy supply. The provided data model is separated into two publications for static and dynamic information. The static information regarding the infrastructure is not subject to frequent changes, whereas the dynamic part offers the ability to provide highly up-to-date information. The static part covers all relevant information on vehicle energy infrastructure, e.g. sites, stations and refill points for electric vehicles as well as petrol, gasoline or gas-based refuelling for vehicles. In terms of dynamic information, the availability of the infrastructure, possible faults and a price indication are covered.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2022-03

CEN/TS 16157-11 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 11: Publication of machine interpretable traffic regulations

🔗 URL: https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:71777&cs=10465408B33310E1C137C3B2AABC7EE51

ABSTRACT: This document specifies a publication sub-model within the DATEX II model that supports the publication of electronic traffic regulations. This publication is intended to support the exchange of informational content from road traffic authorities issuing traffic regulation orders and organisations implementing these orders to other organisations providing ITS services or onward information exchange.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2022-03

CEN/TS 16157-12 Intelligent transport systems — DATEX II management and information — Part 12: Facilities publications

🔗 URL: https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT,FSP_LANG_ID:73025,25&cs=191FBA7A8FAE57738466F76A27106F67D

ABSTRACT: This document specifies and defines component facets supporting the exchange and shared use of data and information in the field of traffic and travel. The component facets include the framework and context for exchanges, the modelling approach, data content, data structure and relationships.

📄 DOCUMENT TYPE: Standard_Specification


📅 PUBLICATION DATE: 2022-05

CEN/TS 16157-8 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 8: Traffic management publications and extensions dedicated to the urban environment

🔗 URL: https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:68653&cs=18BC2B0B4960475D11D2ABEA1D8C23A2D

ABSTRACT: This document constitutes a Part of the CEN 16157 DATEX II series of standards and technical specifications. This series specifies and defines component facets supporting the exchange and shared use of data and information in the field of traffic and travel. The component facets include the framework and context for exchanges, the modelling approach, the data content, the data structure and relationships and the communications specification. Part 8, this document, specifies additional data model structures that are applicable for traffic management applications in the urban environment. This Part addresses data concepts to support the exchange of Traffic Management Plans, rerouting, extensions of the existing DATEX II core model to better support application to the urban environment. It establishes specifications for data exchange between any two instances of the following actors:

- (1) Traffic Information Centres (TICs),
- (2) Traffic Control Centres (TCCs),
- (3) Service Providers (SPs). Note that the use of this document may be applicable for use by other actors.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-04

CEN/TS 16157-9 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 9: Traffic signal management publications dedicated to the urban environment

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:68652&cs=18B5180A209437120996363BB8237DDAC

ABSTRACT: This document constitutes a part of the CEN 16157 DATEX II series of standards and technical specifications. This series specifies and defines component facets supporting the exchange and shared use of data and information in the field of traffic and travel. The component facets include the framework and context for exchanges, the modelling approach, the data content, the data structure and relationships and the communications specification. Part 9, this document, specifies additional data model structures that are applicable for traffic signal management applications in the urban environment. This part specifies data concepts to support the exchange of traffic signal status messaging, intersection geometry definition and attribution in a consistent way with existing C-ITS standards and technical specifications. It establishes specifications for data exchange between any two instances of the following actors:

- (1) Traffic Information Centres (TICs),
- (2) Traffic Control Centres (TCCs),
- (3) Service Providers (SPs). Note that the use of this document may be applicable for use by other actors.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-04

CEN/TS 16614-1:2020 Public transport - Network and Timetable Exchange (NeTeX) - Part 1: Public transport network topology exchange format

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:66892&cs=1CAED5ABB1179CBAE5D7E61C865704C55

ABSTRACT: 1.1 General NeTeX is dedicated to the exchange of scheduled data (network, timetable and fare information). It is based on Transmodel V6 (EN 12896 series) and SIRI (CEN/TS 15531-4/-5 and EN 15531-1/-2/-3) and supports the exchange of information of relevance for passenger information about public transport services and also for running Automated Vehicle Monitoring Systems (AVMS). **NOTE** Many NeTeX concepts are taken directly from Transmodel; the definitions and explanation of these concepts are extracted directly from the respective standard and reused in NeTeX, sometimes with adaptations in order to fit the NeTeX context. Although the data exchanges targeted by NeTeX

are predominantly oriented towards provisioning passenger information systems and AVMS with data from transit scheduling systems, it is not restricted to this purpose and NeTeX can also provide an effective solution to many other use cases for transport data exchange. 1.2 Transport modes All mass public transport modes are taken into account by NeTeX, including train, bus, coach, metro, tramway, ferry, and their submodes. It is possible to describe airports and air journeys, but there has not been any specific consideration of any additional requirements that apply specifically to air transport. 1.3 Compatibility with existing standards and recommendations Concepts covered in NeTeX that relate in particular to long-distance train travel include; rail operators and related organizations; stations and related equipment; journey coupling and journey parts; train composition and facilities; planned passing times; timetable versions and validity conditions. In the case of long distance train the NeTeX takes into account the requirements formulated by the ERA (European Rail Agency) - TAP/TSI (Telematics Applications for Passenger/ Technical Specification for Interoperability, entered into force on 13 May 2011 as the Commission Regulation (EU) No 454/2011), based on UIC directives. As regards the other exchange protocols, a formal compatibility is ensured with TransXChange (UK), VDV 452 (Germany), NEPTUNE (France), UIC Leaflet, BISON (The Netherlands) and NOPTIS (Nordic Public Transport Interface Standard). The data exchange is possible either through dedicated web services, through data file exchanges, or using the SIRI exchange protocol as described in part 2 of the SIRI documentation.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2020-04

ETSI EG 202 798 ITS; Testing; Framework for conformance and interoperability testing

📄 URL: http://www.etsi.org/deliver/etsi_eg/202700_202799/202798/01.01.01_60/eg_202798v010101p.pdf

ABSTRACT: This document specifies the global framework for conformance and interoperability testing in ITS.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2011-01

ETSI EN 302 665 ITS; Communications Architecture

📄 URL: http://www.etsi.org/deliver/etsi_en/302600_302699/302665/01.01.01_60/en_302665v010101p.pdf

ABSTRACT: Definition of ITS Communications Architecture for Europe including the following views:

- (1) Scenario description;
- (2) Functional View and Information View;
- (3) OSI reference model view including: Application View, Security View, Network&Transport View, Interface View, Management view;
- (4) Engineering view to support Implementation Guidelines for Interoperability;
- (5) Enterprise/Organizational/Operational view.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2010-09

ETSI TS 102 894-2 ITS; Users and applications requirements; Part 2: Applications and facilities layer common data dictionary

📄 URL: http://www.etsi.org/deliver/etsi_ts/102800_102899/10289402/01.03.01_60/ts_10289402v010301p.pdf

ABSTRACT: Definition and specifications on the common data container at the applications and facilities layer.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2018-08

ETSI TS 103 301 ITS; Vehicular Communications; Basic Set of Applications; Facilities layer protocols and communication requirements for infrastructure services

URL: http://www.etsi.org/deliver/etsi_ts/103300_103399/103301/01.03.01_60/ts_103301v010301p.pdf

ABSTRACT: The present document provides specifications of infrastructure related ITS services to support communication between infrastructure ITS equipment and traffic participants using ITS equipment (e.g. vehicles, pedestrians). It defines services in the Facilities layer for communication between the infrastructure and traffic participants. The specifications cover the protocol handling for infrastructure-related messages as well as requirements to lower layer protocols and to the security entity. It has been published for both Release 1 (V1.3.1) and Release 2 (V2.1.1) of the ETSI C-ITS standards.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2020-02

SAE AIR6988 Artificial Intelligence in Aeronautical Systems: Statement of Concerns

URL: <https://www.sae.org/standards/content/air6988/>

ABSTRACT: This document reviews current aerospace software, hardware, and system development standards used in the certification/approval process of safety-critical airborne and ground-based systems, and assesses whether these standards are compatible with a typical Artificial Intelligence (AI) and Machine Learning (ML) development approach. The document then outlines what is required to produce a standard that provides the necessary accommodation to support integration of ML-enabled sub-systems into safety-critical airborne and ground-based systems, and details next steps in the production of such a standard.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2021-04

SAE J2945/1 On-Board System Requirements for V2V Safety Communications

URL: https://www.sae.org/standards/content/j2945/1_202004/

ABSTRACT: This standard specifies the system requirements for an on-board vehicle-to-vehicle (V2V) safety communications system for light vehicles, including standards profiles, functional requirements, and performance requirements. The system is capable of transmitting and receiving the SAE J2735-defined basic safety message (BSM) over a dedicated short-range communications (DSRC) wireless communications link as defined in the IEEE 1609 suite and IEEE 802.11 standards. DSRC is a U.S. Department of Transportation (DOT) project based on ISO's Communications Access for Land Mobiles (CALM) architecture for vehicle-based communication networks, particularly for applications such as toll collection, vehicle safety services, and commerce transactions via cars.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2020-04

IEEE - P1451-99 Standard for Harmonization of Internet of Things (IoT) Devices and Systems

[URL: https://standards.ieee.org/ieee/1451.99/10355/](https://standards.ieee.org/ieee/1451.99/10355/)

ABSTRACT: The standard utilizes the advanced capabilities of the XMPP protocol, such as providing globally authenticated identities, authorization, presence, life cycle management, interoperable communication, IoT discovery and provisioning. Descriptive meta-data about devices and operations will provide sufficient information for infrastructural components, services and end-users to dynamically adapt to a changing environment. Key components and needs of a successful Smart City infrastructure will be identified and addressed. This standard does not develop Application Programming Interfaces (APIs) for existing IoT or legacy protocols.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2020-09

ITU-T Y.4201 (02/2018) High-level requirements and reference framework of smart city platforms

[URL: https://handle.itu.int/11.1002/1000/13388](https://handle.itu.int/11.1002/1000/13388)

ABSTRACT: This recommendation presents the high-level requirements and reference framework of Smart City Platform (SCP). The SCP is a fundamental platform supporting all the services and applications of a smart city, with the objective to improve quality of life, provide urban operation and services for the benefit of the citizens while ensuring city sustainability. These high-level requirements include comprehensive and updated repositories of city information, infrastructure life-cycle management, inter-system communication, security support, maintenance support, controls of processor, decision making support, real-time dissemination of public information, resiliency, and interoperability.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2018-02

ITU-T Y.4461 (01/2020) Framework of Open Data in Smart Cities

[URL: https://handle.itu.int/11.1002/1000/14164](https://handle.itu.int/11.1002/1000/14164)


ABSTRACT: This recommendation defines a conceptual model of Open Data in Smart Cities, in order to establish and foster a common understanding of Open Data in Smart Cities. The scope of this Recommendation includes: a) definition of Open Data in Smart Cities; b) benefits of Open Data in Smart Cities; c) fundamental requirements of Open Data in Smart Cities; d) conceptual model of Open Data in Smart Cities.

DOCUMENT TYPE: Standard_Specification


PUBLICATION DATE: 2020-01

■ Water

ISO/IEC 30183 ED1 Internet of Things (IoT) – Addressing interoperability guidelines between heterogeneous underwater sensor networks (UWASNs) based on underwater delay and disruption tolerant network (U-DTN)

 **URL:** https://www.iec.ch/dyn/www/f?p=103:38:204774363295796:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:20486,23,108553

ABSTRACT: This document provides addressing interoperability guidelines between heterogeneous underwater acoustic sensor networks (UWASNs) based on underwater delay and disruption tolerant network (UDTN): (1) Architecture for heterogeneous UWASNs interworking; (2) U-DTN functions on heterogeneous UWASNs interworking; (3) Addressing interoperability guidelines between heterogeneous UWASNs.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under develop-ment

■ Education_Training_and_Learning

■ Energy

ISO/IEC TR 30148:2019 Internet of things (IoT) - Application of sensor network for wireless gas meters

🔗 **URL:** <https://webstore.iec.ch/publication/63562>

ABSTRACT: ISO/IEC TR 30148:2019 describes: (1) the structure of wireless gas meter networks, and (2) the application protocol of wireless gas meter networks.

📄 **DOCUMENT TYPE:** Technical_Report

📅 **PUBLICATION DATE:** 2019-10

■ Horizontals & Verticals

ETSI TR 103 534-1 Teaching Material: Part 1 (Security)

🔗 **URL:** https://www.etsi.org/deliver/etsi_tr/103500_103599/10353401/01.01.01_60/tr_10353401v010101p.pdf

ABSTRACT: The document is based on the Security Report ETSI TR 103 533. It presents teaching material to allow readers, identified by role, to gain knowledge of the fundamentals of IoT security.

📄 **DOCUMENT TYPE:** Technical_Report

📅 **PUBLICATION DATE:** 2019-08

ETSI TR 103 534-2 Teaching Material: Part 2 (Privacy)

🔗 **URL:** https://www.etsi.org/deliver/etsi_tr/103500_103599/10353402/01.01.01_60/tr_10353402v010101p.pdf

ABSTRACT: The document is based on the Privacy Report ETSI TR 103 591. It focuses on producing teaching material on privacy and to direct the reader to other materials that are available in order to gain a basic understanding on what is involved in the privacy concept that is especially relevant, also, for the IoT environment.

📄 **DOCUMENT TYPE:** Technical_Report

📅 **PUBLICATION DATE:** 2019-10

ETSI TR 103 535 Guidelines for semantic interoperability in the industry

🔗 **URL:** https://www.etsi.org/deliver/etsi_tr/103500_103599/103535/01.01.01_60/tr_103535v010101p.pdf

ABSTRACT: The document addresses the topic of semantic interoperability in the context of its

potential usage by the industry in the development of IoT systems. The main objective of the document is to concretely foster the use of semantic interoperability in IoT by identify why it is important in industry IoT projects, to analyse the advantages and drawback of the available solutions.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2019-10

Cloudwatch D3.6 Security and Interoperability Standards Status Report

🔗 URL: https://www.cloudwatchhub.eu/sites/default/files/CloudWATCH2_Security-and-Interoperability-Standards-Status-Report.pdf

ABSTRACT: This document provides a monitoring of the standards landscape, identifying necessary extensions and profiles, and identifying relevant standards groups for future engagement of the EU projects. Through this deliverable CloudWATCH2 is able to:

- (1) Leverage input provided by finalized and on-going FP7 and H2020 projects to prepare and maintain a list of standards used by the different consortia. The list describes the level of adoption of each standard and the most common implementations.
- (2) Identify contributions to existing and developing standard from the FP7 and H2020 projects.
- (3) Provide evidence to the standardization community of identified gaps by analysing input from the above mentioned FP7 and H2020 projects.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2017-09

■ Environment

ISO/IEC 30179 ED1 Internet of Things (IoT) - Overview and general requirements of IoT system for ecological environment monitoring

🔗 URL: https://www.iec.ch/dyn/www/f?p=103:38:204774363295796::::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:20486,23,105254

ABSTRACT: This document specifies the Internet of Things system for ecological environment monitoring in the following: (1) System infrastructure and system entities of the IoT system for ecological environment monitoring for natural entities such as air, water, soil, living creatures; and (2) The general requirements of the IoT system for ecological environment monitoring.


📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: Under develop-ment

ITU-T Y Suppl. 27 (01/2016) ITU-T Y.4400 series – Smart Sustainable Cities – Setting the framework for an ICT architecture

 **URL:** <https://handle.itu.int/11.1002/1000/12753>

ABSTRACT: The scope of this standardization work is to describe the ICT architecture development framework of SSC and provide corresponding architecture views and guides with the key objective of highlighting this promising and game-changing area for future IoT standardization. Specifically, the proposed new Supplement will cover, but is not limited to: a) ICT Architecture development methodology; b) SSC ICT Architecture development methodology; c) SSC ICT architecture framework; d) Guidelines for the SSC ICT architecture; e) SSC ICT Architecture interfaces.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-01

ITU-T Y Suppl. 28 (01/2016) ITU-T Y.4550 series – Smart Sustainable Cities – Integrated management for smart sustainable cities

 **URL:** <https://handle.itu.int/11.1002/1000/12754>

ABSTRACT: The scope of this standardization work is to provide a technical proposal for integrated management, which can be followed by any municipality interested in improving the management of its infrastructure, operations and citizen interactions, and in addressing critical urban challenges – such as security, criminality, pollution, traffic congestion, inadequate infrastructure, and response to natural hazards. Specifically, the proposed new Supplement covers, but is not limited to:

- a) Resources, challenges and technologies of integrated management for smart sustainable cities;
- b) Integrated management for smart sustainable cities;
- c) Service framework.

 **DOCUMENT TYPE:** Standard_Specification


 **PUBLICATION DATE:** 2016-01

ITU-T Y Suppl. 29 (01/2016) ITU-T Y.4250 series – Smart Sustainable Cities – Multi-service infrastructure in new-development areas

 **URL:** <https://handle.itu.int/11.1002/1000/12755>

ABSTRACT: The scope of this standardization work is to describe the various infrastructures for a smart sustainable city in a new-development area with a key objective of highlighting this promising and game-changing area for future IoT standardization. Specifically, the proposed new Supplement will cover, but is not limited to:

- a) Smart Sustainable Building Utility Services;
- b) SSC (Smart Sustainable Cities) Utility Service Requirements;
- c) Opportunities for sharing infrastructure at street level.

 **DOCUMENT TYPE:** Standard_Specification


 **PUBLICATION DATE:** 2016-01

ITU-T Y Suppl. 30 (01/2016) ITU-T Y.4250 series – Smart Sustainable Cities – Overview of smart sustainable cities infrastructure

 **URL:** <https://handle.itu.int/11.1002/1000/12756>

ABSTRACT: The scope of this standardization work is to provide a technical overview on infrastructure related to information and communications technology (ICT), specific to developing smart sustainable cities (SSC) with the key objective of highlighting this promising and game-changing area for future IoT standardization. Specifically, the proposed new Supplement will cover, but not limited to:

- a) SSC stakeholders;
- b) ICT infrastructure for SSC;
- c) Physical infrastructure and its intelligent upgrading;
- d) Planning deployment of ICT infrastructure for SSC;
- e) Example of open access network for smart cities;
- f) Strategies for the deployment of digital/ICT infrastructure.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-01

■ Industry_and_Business

■ Horizontals & Verticals

3GPP TR 38.825 V16.0.0 Study on NR industrial Internet of Things (IoT)


 **URL:** <https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3492>

ABSTRACT: The present document is related to Study on NR Industrial Internet of Things (IoT). The document describes NR enhancements to Ultra Reliable Low Latency Communications (URLLC) and Industrial Internet of Things, which were analysed as part of the study such as data duplication and multi-connectivity enhancements, solutions for UL/DL intra-UE prioritization/multiplexing and Time Sensitive Networking support (TSN) via accurate reference timing delivery, QoS/scheduling enhancements for TSN traffic types, Ethernet header compression. The Technical Report captures also performance analysis of TSN requirements.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2019-03

All Industrial Internet Architecture

 **URL:** <http://en.ii-alliance.org/index.php?m=content&c=index&a=show&catid=17&id=25>

ABSTRACT: The industrial internet involves all segments and all entities of industry and ICT fields and is evolving into an entirely new and complicated eco-system. Discrepancies in understanding the industrial internet may lead to divergences in choosing technologies and standard roadmaps, which will affect the interoperability and raise deployment costs. For this reason, the Alliance of Industrial Internet (All) launched the study on the industrial internet architecture, and developed this "Industrial Internet Architecture" report (version 1.0) based on development practices at both home and abroad and introduces the connotations, targets, architecture, key elements and trends of the industrial internet. It aims to (1) drive the industry community to reach a wide consensus on industrial internet, (2) to provide references and guidance to All's works, such as the technical innovation, standard development, test and verification, application practices, etc. of industrial internet by taking the architecture as a traction, and (3) to boost the healthy and fast development of industrial internet.


 **DOCUMENT TYPE:** Whitepaper

 **PUBLICATION DATE:** 2016-12

GSI EPCIS EPC Information Services (EPCIS) Standard, v1.2 (2016)

 **URL:** <https://ref.gs1.org/standards/epcis/>

ABSTRACT: Data and Information Management - Enable trading partners to share information about the physical movement and status of products as they travel throughout the supply chain.

 **DOCUMENT TYPE:** Standard_Specification


 **PUBLICATION DATE:** 2022-06

ISO/IEC 30162:2022 Internet of things (IoT) - Compatibility requirements and model for devices within Industrial IoT systems

 **URL:** <https://webstore.iec.ch/publication/63489>

ABSTRACT: ISO/IEC 30162:2022 specifies network models for IIoT connectivity and general compatibility requirements for devices and networks within IIoT systems in terms of:

- a) data transmission protocols interaction;
- b) distributed data interoperability & management;
- c) connectivity framework;
- d) connectivity transport;
- e) connectivity network;
- f) best practices and guidance to use in IIoT area

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2022-02

ISO/IEC 30163:2021 System requirements of IoT/SN technology-based integrated platform for chattel asset monitoring supporting financial services

 **URL:** <https://www.iso.org/standard/53283.html>

ABSTRACT: ISO/IEC 30163:2021 specifies the system requirements of an Internet of Things (IoT)/Sensor Network (SN) technology-based platform for chattel asset monitoring supporting financial services, including:

- (1) System infrastructure that describes functional components;
- (2) System and functional requirements during the entire chattel asset management process, including chattel assets in transition, in/out of warehouse, storage, mortgage, etc.;
- (3) Performance requirements and performance specifications of each functional component; - Interface definition of the integrated platform system.

This document is applicable to the design and development of IoT/SN system for chattel asset monitoring supporting financial services.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-03

oneM2M TR-0018-V-4.0.0 Industrial Domain Enablement

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=29334>

ABSTRACT: This oneM2M Technical Report collects the use cases of the industrial domain and the requirements needed to support them collectively. Furthermore, the Technical Report also identifies necessary technical work needing to be addressed while enhancing future oneM2M specifications.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2019-09

UN P1095 E Negotiation

 **URL:** <https://uncefact.unece.org/display/uncefactpublic/E+Negotiation>

ABSTRACT: This document focuses on Data and Information Management - Semantics of the negotiation process and exchanged information prior to the exchange of purchase order information.

DOCUMENT TYPE: Framework

PUBLICATION DATE: 2022-01

Manufacturing

IEC Asset Administration Shell for Industrial Applications – Part 2: Information meta model

URL: https://www.iec.ch/dyn/www/f?p=103:38:731054763917753:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:1250,23,109017

ABSTRACT: This document specifies the Asset Administration Shell for Industrial Applications, focusing on the information meta model. This document is Under development.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: Under development

IEC 61987-1:2006 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 1: Measuring equipment with analogue and digital output

URL: <https://webstore.iec.ch/publication/6225>

ABSTRACT: IEC 61987-1:2006 defines a generic structure in which product features of industrial-process measurement and control equipment with analogue or digital output should be arranged, in order to facilitate the understanding of product descriptions when they are transferred from one party to another. It applies to the production of catalogues of process measuring equipment supplied by the manufacturer of the product and helps the user to formulate his requirements.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2006-12-14

IEC 61987-10:2009 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 10: List of Properties (LOPs) for Industrial-Process Measurement and Control for Electronic Data Exchange - Fundamentals

URL: <https://webstore.iec.ch/publication/6227>

ABSTRACT: IEC 61987-10:2009 provides a method of standardizing the descriptions of process control devices, instrumentation and auxiliary equipment as well as their operating environments and operating requirements (for example, measuring point specification data). The aims of this standard are: (1) to define a common language for customers and suppliers through the publication of Lists of Properties (LOPs), (2) to optimize workflows between customers and suppliers as well as in processes such as engineering, development and purchasing within their own organizations, (3) to reduce transaction costs. The standard describes industrial-process device types and devices using structured lists of properties and makes the associated properties available in a component data dictionary.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2009-07-23

IEC 61987-11:2016 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 11: List of properties (LOPs) of measuring equipment for electronic data exchange - Generic structures

 **URL:** <https://webstore.iec.ch/publication/32275>

ABSTRACT: IEC 61987-11:2016 provides: (1) a characterisation of industrial process measuring equipment (device type dictionary) for integration in the Common Data Dictionary (CDD), and (2) generic structures for operating lists of properties (OLOP) and device lists of properties (DLOP) of measuring equipment in conformance with IEC 61987-10. This second edition cancels and replaces the first edition published in 2012. This edition constitutes a technical revision. This edition includes the following significant technical changes with respect to the previous edition:

(a) The classification in Table A.1 has been amended to reflect the changes in the classification scheme of process measuring equipment in the CDD due to the development of IEC 61987-14, IEC 61987-15 and IEC 61987-16.

(b) Annex A has become “informative”.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-12-15

IEC 61987-12:2016 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 12: Lists of properties (LOPs) for flow measuring equipment for electronic data exchange

 **URL:** <https://webstore.iec.ch/publication/24401>

ABSTRACT: IEC 61987-12:2016 provides an operating list of properties (OLOP) for the description of the operating parameters and the collection of requirements for a flow measuring equipment and device lists of properties (DLOP) for the description of a number of flow measuring equipment types.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-03-23

IEC 61987-13:2016 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 13: Lists of properties (LOP) for pressure measuring equipment for electronic data exchange

 **URL:** <https://webstore.iec.ch/publication/24400>

ABSTRACT: IEC 61987-13:2016 provides an operating list of properties (OLOP) for the description of the operating parameters and the collection of requirements for a pressure measuring equipment, and device lists of properties (DLOP) for a range of pressure measuring equipment types describing them.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-03-23

IEC 61987-14:2016 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 14: Lists of properties (LOP) for temperature measuring equipment for electronic data exchange

 **URL:** <https://webstore.iec.ch/publication/24637>

ABSTRACT: IEC 61987-14:2016 provides an operating list of properties (OLOP) for the description of the operating parameters and the collection of requirements for temperature measuring equipment and device lists of properties (DLOP) for the description of a range of contact and non-contact temperature measuring equipment types.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-04-26

IEC 61987-15:2016 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 15: Lists of properties (LOPs) for level measuring equipment for electronic data exchange

 **URL:** <https://webstore.iec.ch/publication/26177>

ABSTRACT: IEC 61987-15:2016 provides operating list of properties (OLOP) for the description of the operating parameters and the collection of requirements for level measuring equipment, and device lists of properties (DLOPs) for the description of a range of level measuring equipment types.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-11-08

IEC 61987-16:2016 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 16: List of properties (LOPs) for density measuring equipment for electronic data exchange


 **URL:** <https://webstore.iec.ch/publication/34265>

ABSTRACT: IEC 61987-16:2016 provides an (1) operating list of properties (OLOP) for the description of the operating parameters and the collection of requirements for a density measuring equipment, and (2) device lists of properties (DLOP) for a range of density measuring equipment types describing them. The structures of the OLOP and the DLOP correspond with the general structures defined in IEC 61987-11 and agree with the fundamentals for the construction of LOPs defined in IEC 61987-10.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-12-15

IEC 61987-32 ED1 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 32: Lists of properties (LOP) for I/O modules for electronic data exchange

 **URL:** https://www.iec.ch/ords/f?p=103:38:401030832849310:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:1452,23,102293

ABSTRACT: This document focuses on Industrial-process measurement and control - Data structures

and elements in process equipment catalogues. It lists the properties for I/O modules for electronic data exchange. This document is Under develop-ment.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: Under develop-ment

IEC 61987-41 ED1 Generic structures of List of Properties (LOP) of Process Analyzer Technology (PAT) measuring devices for electronic data exchange

🔗 URL: https://www.iec.ch/ords/f?p=103:38:401030832849310:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:1452,23,107355

ABSTRACT: This document focuses on generic structures of List of Properties of Process Analyzer Technology (PAT) on measuring devices for electronic data exchange. This document is Under develop-ment.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: Under develop-ment

IEC 61987-92:2018 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 92: Lists of properties (LOP) of measuring equipment for electronic data exchange - Aspect LOPs

🔗 URL: <https://webstore.iec.ch/publication/33096>

ABSTRACT: IEC 61987-92:2018 provides the lists of properties (LOPs) describing aspects of equipment for industrial-process automation that is subject to IEC 61987 standard series. This standard series proposes a method for standardization which will help both suppliers and users of measuring equipment to optimize workflows both within their own companies and in their exchanges with other companies. IEC 61987-92 contains additional aspects that are common to all devices, for example, "Packaging and transportation", "Calibration and test results" and "Device documents supplied". The structures of the LOPs correspond to the general structures defined in IEC 61987-11 and agree with the fundamentals for the construction of LOPs defined in IEC 61987-10. Libraries of properties and of blocks used in the aspect LOPs are listed in Annex B and Annex C.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2018-06-05

IEC 62443-2-1:2010 Industrial communication networks - Network and system security - Part 2-1: Establishing an industrial automation and control system security program

🔗 URL: <https://webstore.iec.ch/publication/7030>

ABSTRACT: IEC 62443-2-1:2010 defines the elements necessary to establish a cyber security management system (CSMS) for industrial automation and control systems (IACS) and provides guidance on how to develop those elements. This standard uses the broad definition and scope of what constitutes an IACS described in IEC/TS 62443-1-1. The elements of a CSMS described in this standard are mostly policy, procedure, practice and personnel related, describing what shall or should be included in the final CSMS for the organization. This bilingual version (2012-04) corresponds to the monolingual English version, published in 2010-11.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2010-11


IEC 62443-4-2:2019 Security for industrial automation and control systems - Part 4-2: Technical security requirements for IACS components

 **URL:** <https://webstore.iec.ch/publication/34421>

ABSTRACT: IEC 62443-4-2:2019 provides detailed technical control system component requirements (CRs) associated with the seven foundational requirements (FRs) described in IEC TS 62443-1-1 including defining the requirements for control system capability security levels and their components, SL-C (component). As defined in IEC TS 62443-1-1 there are a total of seven foundational requirements (FRs):

- a) identification and authentication control (IAC),
- b) use control (UC),
- c) system integrity (SI),
- d) data confidentiality (DC),
- e) restricted data flow (RDF),
- f) timely response to events (TRE), and
- g) resource availability (RA).

These seven FRs are the foundation for defining control system security capability levels. Defining security capability levels for the control system component is the goal and objective of this document as opposed to SL-T or achieved SLs (SL-A), which are out of scope.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2019-02

IEC 62832-1:2020 Industrial-process measurement, control and automation - Digital factory framework - Part 1: General principles

 **URL:** <https://webstore.iec.ch/publication/65858>

ABSTRACT: IEC 62832-1:2020 defines the general principles of the Digital Factory framework (DF framework), which is a set of model elements (DF reference model) and rules for modelling production systems. This DF framework defines: a) model of production system assets; b) a model of relationships between different production system assets; c) the flow of information about production system assets. d) The DF framework does not cover representation of building construction, input resources (such as raw production material, assembly parts), consumables, work pieces in process, nor end products, e) It applies to the three types of production processes (continuous control, batch control, and discrete control) in any industrial sector (for example aeronautic industries, automotive, chemicals, wood).


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-10

IEC 62832-2:2020 Industrial-process measurement, control and automation - Digital factory framework - Part 2: Model elements

 **URL:** <https://webstore.iec.ch/publication/60214>

ABSTRACT: IEC 62832-2:2020 specifies detailed requirements for model elements of the Digital Factory framework. It defines the nature of the information provided by the model elements, but not the format of this information.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-10

IEC 62832-3:2020 Industrial-process measurement, control and automation - Digital factory framework - Part 3: Application of Digital Factory for life cycle management of production systems

 **URL:** <https://webstore.iec.ch/publication/60277>

ABSTRACT: IEC 62832-3:2020 specifies rules of the Digital Factory framework for managing information of a production system throughout its life cycle. It also defines how the information will be added, deleted or changed in the Digital Factory by the various activities during the life cycle of the production system.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-10

IEC 62872-2:2022 Industrial-process measurement, control and automation - Part 2: Internet of Things (IoT) - Application framework for industrial facility demand response energy management

 **URL:** <https://webstore.iec.ch/publication/63419>


ABSTRACT: IEC 62872-2:2022 presents an IoT application framework for industrial facility demand response energy management (FDREM) for the smart grid, enabling efficient information exchange between industrial facilities using IoT related communication technologies. This document specifies:

- (1) an overview of the price-based demand response program that serves as basic knowledge backbone of the IoT application framework;
- (2) a IoT-based energy management framework which describes involved functional components, as well as their relationships;
- (3) detailed information exchange flows that are indispensable between functional components;
- (4) existing IoT protocols that need to be identified for each protocol layer to support this kind of information exchange;
- (5) communication requirements that guarantee reliable data exchange services for the application framework.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2022-02

IEC 63278-1 ED1 Asset Administration Shell for industrial applications – Part 1: Asset Administration Shell structure


 **URL:** https://www.iec.ch/dyn/www/f?p=103:38:731054763917753:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:1250,23,103536

ABSTRACT: This document focuses on the specification of the structure for the Asset Administration Shell for industrial applications. This document is Under development.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under development

IEC 63278-3 ED1 Asset Administration Shell for Industrial Applications – Part 3: Security provisions for Asset Administration Shells


 **URL:** https://www.iec.ch/dyn/www/f?p=103:38:731054763917753:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:1250,23,109075

ABSTRACT: This document focuses on the specification of the Security provisions for Asset Administration Shells. This document is Under develop-ment.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under develop-ment

IEC 63339 ED1 Unified reference model for smart manufacturing


 **URL:** https://www.iec.ch/dyn/www/f?p=103:38:731054763917753:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:1250,23,104329

ABSTRACT: This document focuses on the specification of the unified reference model for smart manufacturing. This document is Under develop-ment.


 **DOCUMENT TYPE:** Standard_Specification


 **PUBLICATION DATE:** Under develop-ment

IEC 63376 ED1 INDUSTRIAL FACILITY ENERGY MANAGEMENT SYSTEM (FEMS) – Functions and Information Flows

 **URL:** https://www.iec.ch/dyn/www/f?p=103:38:731054763917753:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:1250,23,104647

ABSTRACT: This document focuses on the specification of the functions and information flows for the industrial facility energy management system. This document is Under develop-ment.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under develop-ment

IEC TR 63283-1:2022 Industrial-process measurement, control and automation - Smart manufacturing - Part 1: Terms and definitions

 **URL:** <https://webstore.iec.ch/publication/66314>

ABSTRACT: IEC TR 63283-1:2022(E) is to compile a comprehensive collection of base terminology with compatible terms that can become relevant within the scope of Smart Manufacturing. Most of these terms refer to existing definitions in the domain of industrial-process measurement, control and automation and its various subdomains. When multiple similar definitions exist for the exact same term in different standards, this document contains only the preferred definition in the context of Smart Manufacturing. Whenever the existing definitions are not compatible with other terms in this document or when the definition does not fit into the broader scope of Smart Manufacturing, new or modified definitions are given.


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-03

IEC TS 62443-1-1:2009 Industrial communication networks - Network and system security - Part 1-1: Terminology, concepts and models

 **URL:** <https://webstore.iec.ch/publication/7029>

ABSTRACT: IEC/TS 62443-1-1:2009(E) is a technical specification which defines the terminology, concepts and models for Industrial Automation and Control Systems (IACS) security. It establishes the basis for the remaining standards in the IEC 62443 series.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2009-07

IEC TS 62872-1:2019 Industrial-process measurement, control and automation - Part 1: System interface between industrial facilities and the smart grid

 **URL:** <https://webstore.iec.ch/publication/62884>

ABSTRACT: IEC 62872-1:2019(E) defines the interface, in terms of information flow, between industrial facilities and the "smart grid". It identifies, profiles and extends where required, the standards needed to allow the exchange of the information needed to support the planning, management and control of electric energy flow between the industrial facility and the smart grid. The scope of this document specifically excludes the protocols needed for the direct control of energy resources within a facility where the control and ultimate liability for such control is delegated by the industrial facility to the external entity (e.g. distributed energy resource (DER) control by the electrical grid operator).

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2019-06

ISO/IEC 30162:2022 Internet of Things (IoT) - Compatibility requirements and model for devices within Industrial IoT systems

 **URL:** <https://webstore.iec.ch/publication/63489>

ABSTRACT: ISO/IEC 30162:2022 specifies network models for IIoT connectivity and general compatibility requirements for devices and networks within IIoT systems in terms of:

- a) data transmission protocols interaction;
- b) distributed data interoperability & management;
- c) connectivity framework;
- d) connectivity transport;
- e) connectivity network;
- f) best practices and guidance to use in IIoT area.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** February 2022

ISO/IEC 30163:2021 Internet of Things (IoT) - System requirements of IoT and sensor network technology-based integrated platform for chattel asset monitoring

 **URL:** <https://webstore.iec.ch/publication/63491>

ABSTRACT: ISO/IEC 30163:2021 specifies the system requirements of an Internet of Things (IoT)/Sensor

Network (SN) technology-based platform for chattel asset monitoring supporting financial services, including:

- a) System infrastructure that describes functional components;
- b) System and functional requirements during the entire chattel asset management process, including chattel assets in transition, in/out of warehouse, storage, mortgage, etc.;
- c) Performance requirements and performance specifications of each functional component;
- d) Interface definition of the integrated platform system.

This document is applicable to the design and development of IoT/SN system for chattel asset monitoring supporting financial services.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: March 2021

ISO/IEC ISO 20140-5:2017 Automation systems and integration - Evaluating energy efficiency and other factors of manufacturing systems that influence the environment - Part 5: Environmental performance evaluation data

🔗 URL: <https://webstore.iec.ch/publication/34147>

ABSTRACT: ISO 20140-5:2017 specifies the types of environmental performance evaluation (EPE) data, including their attributes, which can be used for evaluating the environmental performance of manufacturing systems based on the general principles described in ISO 20140-1. It also provides recommendations for mapping the EPE data on to information models specified by IEC 62264. In particular, ISO 20140-5:2017:

- (1) applies to discrete, batch and continuous manufacturing,
- (2) is applicable to entire manufacturing facilities and to parts of a manufacturing facility and
- (3) specifically excludes from its scope the syntax of the data and information models, the protocols to exchange data models, the functions that can be enabled by data models, and the activities in Level 1 and Level 2.

The scope of ISO 20140-5:2017 also includes indicating the differences among various data and information models and the differences among various representations of environmental performance by actual data. Moreover, ISO 20140-5:2017 refers to the semantics of the structured data and information models used by communication protocols. The semantics explain the meaning of the attributes and of the context information. The following are outside the scope of ISO 20140-5:2017:

- a) product life cycle assessment;
- b) EPE data that are specific to a particular industry sector, manufacturer or machinery;
- c) acquisition of data; d) the activity of data communication.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2017-04

ISO/IEC TR 30166:2020 Internet of Things (IoT) - Industrial IoT

🔗 URL: <https://webstore.iec.ch/publication/64321>

ABSTRACT: ISO/IEC TR 30166:2020 (E) describes the following: a) general Industrial IoT (IIoT) systems and landscapes which outline characteristics, technical aspects and functional as well as non-functional elements of the IIoT structure and a listing of standardizing organisations, consortia and open-source communities with work on all aspects on IIoT; b) considerations for the future standardization perspective of IIoT including risk analysis, new technologies and identified collaboration.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2020-04

oneM2M TR-0049-V-0.3.0 Industrial Domain Information Model Mapping & Semantics Support

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=30216>

ABSTRACT: This document focuses on the Industrial Domain Information Model Mapping & Semantics Support.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2019-05

■ Mobility

ISO/IEC TR 22560:2017 Information technology - Sensor network - Guidelines for design in the aeronautics industry: Active air-flow control

 **URL:** <https://webstore.iec.ch/publication/60608>

ABSTRACT: This Technical Report describes the concepts, issues, objectives, and requirements for the design of an active air-flow control (AFC) system for commercial aircraft based on a dense deployment of wired and wireless sensor and actuator networks. It focuses on the architecture design, module definition, statement of objectives, scalability analysis, system-level simulation, as well as networking and implementation issues using standardized interfaces and service-oriented middleware architectures.

 **DOCUMENT TYPE:** Standard_Specification


 **PUBLICATION DATE:** 2017-10

■ Water

ISO/IEC 30140-1:2018 Information technology - Underwater acoustic sensor network (UWASN) - Part 1: Overview and requirements

 **URL:** <https://webstore.iec.ch/publication/60609>

ABSTRACT: ISO/IEC 30140-1:2018(E) This part of ISO/IEC 30140 provides a general overview of underwater acoustic sensor networks (UWASN). It describes their main characteristics in terms of the effects of propagation variability and analyses the main differences with respect to terrestrial networks. It further identifies the specificities of UWASN and derives some specific and general requirements for these networks.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-02

■ Information Processing

■ Horizontals & Verticals

ETSI TS 103 779 SmartM2M; Requirements and Guidelines for cross-domain data usability of IoT devices

 **URL:** https://www.etsi.org/deliver/etsi_ts/103700_103799/103779/01.01.01_60/ts_103779v010101p.pdf

ABSTRACT: This specification defines minimum requirements for data and services usability on professional and general public IoT devices and platforms, whether they are critical or not. It constitutes a horizontal cross-domain specification encompassing these requirements.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2022-05

ISO/IEC 19637:2016 Information technology - Sensor network testing framework

 **URL:** <https://webstore.iec.ch/publication/59623>

ABSTRACT: ISO/IEC 19637:2016 specifies: a) testing framework for conformance test for heterogeneous sensor networks; b) generic services between test manager (TMR) and test agent (TA) in the testing framework; and c) guidance for creating testing platform and enabling the test of different sensor network protocols.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-12

ISO/IEC TR 22417:2017 Information technology - Internet of things (IoT) - IoT use cases


 **URL:** <https://webstore.iec.ch/publication/60605>

ABSTRACT: This technical report identifies IoT scenarios and use cases based on real-world applications and requirements. The use cases provide a practical context for considerations on interoperability and standards based on user experience. They also clarify where existing standards can be applied and highlight where standardization work is needed.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2017-11

oneM2M-TR-0006-Study_of_Management_Capability_Enablement-V0_5_1 Study of Management Capability Enablement Technologies for Consideration

 **URL:** https://onem2m.org/images/files/deliverables/TR-0006-Study_of_Management_Capability_Enablement-V0_5_1.doc

ABSTRACT: The present document describes and collects the state-of-art of the existing technologies on management capability, evaluates if the technologies can match the requirements defined in oneM2M, analyzes how the technologies can leverage the design of the architecture of oneM2M.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2015-04

■ Water

[ISO/IEC 30140-2:2017 Information technology - Underwater acoustic sensor network \(UWASN\) - Part 2: Reference architecture](#)

🔗 URL: <https://webstore.iec.ch/publication/60610>

ABSTRACT: This part of ISO/IEC 30140 provides an underwater acoustic sensor network (UWASN) conceptual model by identifying and defining three domains (application domain, network domain and UWASN domain). It also provides multiple reference architecture views consistent with the requirements defined in ISO/IEC 30140-1 (systems reference architecture, communication reference architecture and information reference architecture). For each view, related physical and functional entities are described.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2017-10

[ISO/IEC 30140-3:2018 Information technology - Underwater Acoustic Sensor Network \(UWASN\) - Part 3: Entities and interfaces](#)

🔗 URL: <https://webstore.iec.ch/publication/60611>

ABSTRACT: The 30140 series provides general requirements, reference architecture and high-level interface guidelines supporting interoperability among underwater acoustic sensor networks (UWASNs). Part 3 provides descriptions for the entities and interfaces of the UWASN reference architecture.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2018-07

[ISO/IEC 30140-4:2018 Information technology - Underwater Acoustic Sensor Network \(UWASN\) - Part 4: Interoperability](#)

🔗 URL: <https://webstore.iec.ch/publication/60612>

ABSTRACT: The ISO/IEC 30140 series provides general requirements, reference architecture and high-level interface guidelines supporting interoperability among underwater acoustic sensor networks (UWASNs). Part 4 provides information on interoperability requirements among entities within a UWASN and among various UWASNs.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2018-07

■ Infrastructure

■ Buildings

CSA-IOT ZigBee Document 15-0014-05 ZigBee Lighting & Occupancy Device Specification

 **URL:** <https://csa-iot.org/developer-resource/specifications-download-request/>

ABSTRACT: The Zigbee® Lighting & Occupancy Device (ZLO) Specification is a subset of the Zigbee Home Automation Profile specification that focuses specifically on Lighting & Occupancy-type Zigbee® devices. This document includes device-type definitions, required clusters for each device type, and required attributes for each cluster.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-02

■ Built Environment

CENELEC prEN 50090-6-3 Home and Building Electronic Systems (HBES)- Part 6-3 -3rd Party HBES IoT API

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=305:110:0:::FSP_PROJECT,FSP_LANG_ID:74475,25&cs=1046EE8EC4361FACC3F6370EBB7B68089

ABSTRACT: The 3rd Party HBES IoT API consists of:


- (1) Required restful access methods to read or write Endpoints, to set or retrieve Installation state data.
- (2) Required Endpoints hosting concepts such as Functions and Datapoints comprising the Runtime communication of an (HBES) Installation.
- (3) Required methods to authorize from an IoT 3rd Party Client, additionally, such as the security methods to be used to access the API.
- (4) Required access permission control types: for security reasons the actual access to Functions or Datapoints is gated by the IoT 3rd Party Server, this access will be granted as part of the authorization.
- (5) Endpoints allowing to setup notifications on changes of Installation state data, provided to subscribers that are clients to the Installation.
- (6) For all Endpoints, their expected request/ response document formats, and their content. Moreover, their mandatory and optional parts are as well specified.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under develop-ment

■ Food_and_Agriculture

ETSI TR 103 545 SmartM2M; Pilot test definition and guidelines for testing cooperation between oneM2M and Ag equipment standards

 **URL:** http://www.etsi.org/deliver/etsi_tr/103500_103599/103545/01.01.01_60/tr_103545v010101p.pdf

ABSTRACT: The objective of this TR is to provide the necessary input for a Plugtest® event to validate the possible cooperation between the oneM2M platform and AEF ISOBUS standards implemented between a tractor and its implement (an implement is a machine usually trailed behind the tractor and performing a specific agricultural task). The use case would include a tractor entering a road from the fields. The collaboration of Agri IoT and the oneM2M platform would enable to trigger the transmission of an alarm to the cars on the road. ETSI TC ITS standards, such as EN 302 637-3 (Decentralized Environmental Notification Basic Service) are also expected to be part of this cooperation in the use case to be demonstrated.

 **DOCUMENT TYPE:** Technical_Report


 **PUBLICATION DATE:** 2018-08

■ Energy

CSA-IOT Zigbee Document 07-5356-21 Zigbee Smart Energy Standard

 **URL:** <https://csa-iot.org/developer-resource/specifications-download-request/>

ABSTRACT: This document is a standard for interoperable products that monitor, control, inform, and automate the delivery and use of energy and water. A wireless network is implemented at the consumer's premises using the ZigBee® PRO protocol with the Smart Energy application profile. It enables the development of smart energy applications.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-06

CSA-IOT Zigbee Document 14-0563-18 Zigbee PRO Green Power feature specification Basic functionality set V1.1

 **URL:** <https://csa-iot.org/developer-resource/specifications-download-request/>

ABSTRACT: This document specifies a wireless feature of Zigbee® that allows for energy-harvesting technology to be used directly with the Zigbee stack. Zigbee® Green Power (ZGP) enables battery-less (energy-harvesting) or ultra-long battery devices to securely join Zigbee® PRO networks. Common ZGP devices include switches, sensors, detectors, and buttons. ZGP uses a compact packet format that minimizes the amount of energy used to transmit data. This allows energy-harvesting devices to operate successfully and battery-powered devices to operate for periods in excess of what would be possible on a standard Zigbee network before requiring a replacement battery.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2019-11

ISO/IEC 30144:2020 Internet of things (IoT) - Wireless sensor network system supporting electrical power substation

 **URL:** <https://webstore.iec.ch/publication/62503>

ABSTRACT: ISO/IEC 30144:2020 (E) specifies intelligent wireless sensor network (iWSN) from the perspectives of iWSN's system infrastructure and communications internal and external to the infrastructure, and technical requirements for iWSN to realize smart electrical power substations.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-10

ITU-T L.1221 (11/2018) Innovative energy storage technology for stationary use - Part 2: Battery

 **URL:** <https://handle.itu.int/11.1002/1000/13721>

ABSTRACT: This recommendation contains the main requirements for evaluating appropriate innovative batteries for stationary use for powering ICT equipment in telecom sites, active network units and data centres or customer premises with standardized power interfaces in -48V, up to 400 VDC or 12V.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-11

ITU-T L.1222 (05/2018) Innovative energy storage technology for stationary use - Part 3: Supercapacitor technology

 **URL:** <https://handle.itu.int/11.1002/1000/13579>

ABSTRACT: This recommendation provides an overview of available supercapacitor (SC) technology, with details of SC characteristics (electrical, mechanical, thermal) and applicability in the telecommunication/information and communication technology (TLC/ICT) domain.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2018-05

WITSML WITSML WITSML (Well-site Information Transfer Standard Markup Language) 2.0 (2016)

 **URL:** http://docs.energistics.org/WITSML/WITSML_TOPICS/WITSML-000-000-titlepage.html


ABSTRACT: Data and Information - WITSML is the upstream oil and gas data-transfer standard for specifying and exchanging data for wells and well-related operations and objects, such as drilling, logging, and mud logging.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-11

Health

ETSI TR 103 394 Smart Body Area Networks (SmartBAN); System Description


 **URL:** http://www.etsi.org/deliver/etsi_tr/103300_103399/103394/01.01.01_60/tr_103394v010101p.pdf

ABSTRACT: This report provides the system description for Smart Body Area Networks (Smart BANs). It defines the system overview and use cases of Smart BAN.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2018-01

ETSI TR 103 751 Smart Body Area Networks (SmartBAN); Implant communications


 **URL:** http://www.etsi.org/deliver/etsi_tr/103700_103799/103751/01.01.01_60/tr_103751v010101p.pdf

ABSTRACT: This report evaluates ultra-low power, ultra-wide band technology (UWB) for a swallowable, pill-camera, wireless medical device operating in the 3,1 GHz to 10,6 GHz frequency band. This evaluation is within the context of Smart Body Area Networks (SmartBAN). It considers the SmartBAN requirements, UWB physical layer (PHY) regulation and Medium Access Control (MAC) layer parameters, such as: data rates, modulation, forward error correction, signal-to-noise ratio, quality-of-service and channel sharing, which does not cover article 3.1(b) and 3.2 requirements. The output is a report containing the results of the studies and simulations and concluding with recommendations.


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2021-04

ETSI TS 103 325 Smart Body Area Network (SmartBAN); Low Complexity Medium Access Control (MAC) for SmartBAN

 **URL:** http://www.etsi.org/deliver/etsi_ts/103300_103399/103325/01.01.01_60/ts_103325v010101p.pdf

ABSTRACT: This standard specifies the medium access control and routing for Smart Body Area Networks (Smart BANs). It defines an ultra low power medium access control protocol for on-body communications between a hub and sensor nodes. It also contains provision made for relaying of data through a relay node to the hub.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-04

ETSI TS 103 326 Smart Body Area Network (SmartBAN); Enhanced Ultra-Low Power Physical Layer

 **URL:** http://www.etsi.org/deliver/etsi_ts/103300_103399/103326/01.02.01_60/ts_103326v010201p.pdf

ABSTRACT: This standard specifies the Physical Layer for Smart Body Area Networks (Smart BANs). It defines the lowest layer of the Open Systems Interconnection (OSI) model, the Physical Layer, for on-body communications between a hub and sensor nodes. It has also been enhanced by introducing a more robust synchronization for generic IoT.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-07

ETSI TS 103 327 Smart Body Area Networks (SmartBAN); Service and application standardized enablers and interfaces, APIs and infrastructure for interoperability management


 **URL:** http://www.etsi.org/deliver/etsi_ts/103300_103399/103327/01.01.01_60/ts_103327v010101p.pdf

ABSTRACT: This standard gives the high level description of infrastructure and mechanisms providing solutions for heterogeneity management in Smart BANs. The scope mainly covers the networking level up to the service and application level. The expected solutions mainly concerns the description and the specification of a standardized infrastructure for Smart BAN entities (e.g. sensors, actuators) interactions, data access and monitoring, irrespective of whatever lower layers and radio technologies are used underneath. Finally, on the service and application side, standardized APIs for secure interaction and access to SmartBAN data/entities (data transfer and sharing mechanisms included) are addressed (e.g. PN inspired, web based, XaaS).

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2019-04

ETSI TS 103 378 Smart Body Area Networks (SmartBAN) Unified data representation formats, semantic and open data model

 **URL:** http://www.etsi.org/deliver/etsi_ts/103300_103399/103378/01.01.01_60/ts_103378v010101p.pdf

ABSTRACT: This standard specifies and formalizes SmartBAN unified data representation formats, semantic open data model and corresponding ontology.

It is applicable to a BAN and/or a Smart BAN comprising wearable sensors/actuators devices, a relay/coordinator device and a Hub. The relay/Coordinator and the Hub functionalities may be handled by a single device or by two distinct devices.


In particular, it defines a unified description model with an extensible semantic metadata for Smart BAN entities and related data (including in particular sensor/actuator/relay/coordinator/Hub descriptions and sensed/measured data), as well as for key monitoring and control information.

The document does not address the specification and the formalization of the SmartBAN service ontology and associated enablers. This will be addressed in later dedicated documents of TC SmartBAN.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-12

ETSI TS 103 757 SmartM2M; Asynchronous Contact Tracing System; Fighting pandemic disease with Internet of Things (IoT)

 **URL:** http://www.etsi.org/deliver/etsi_ts/103700_103799/103757/02.01.01_60/ts_103757v020101p.pdf

ABSTRACT: Asynchronous Contact Tracing (ACT) traces the IoT connected object that may have been infected by the Covid-19 virus (or future pandemic viruses).

This shifts the paradigm, from searching for a person in the process of infecting another to the tracing of both potential contamination and infections, and leveraging on the combination of the two information.

The scope of this WI is to standardize the full support of Asynchronous Contact Tracing (ACT) by means of:

- 1) providing some examples of use and deployment of ACT by means of a few explanatory use cases.
- 2) specifying the ACT method and its interaction with deployed contact tracing applications for human and systems. This includes the interaction with the different technologies used by non ACT contact tracing solutions.
- 3) specifying the ACT system including application protocols and API.

The new ACT method will require the use of existing ready-to-market IoT-based technology and well-established wireless network techniques, in particular the ones specified in the ETSI standards ecosystem.

Moreover, it will preserve the user's privacy in accordance with GDPR and/or other regional requirements not requiring the transmission of any personal information by the user.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2021-08

HL7 International FHIR Fast Healthcare Interoperability Resources (FHIR) v4.0.1 (2019)

🔗 URL: <http://hl7.org/fhir/directory.html>

ABSTRACT: Data and Information Management, Interoperability - FHIR is a standard describing data formats and elements and an application programming interface for exchanging electronic health records.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2022-05

IEC 63203-801-1 Wearable electronic devices and technologies - Part 801-1: Smart Body Area Network (SmartBAN) - Enhanced Ultra-Low Power Physical Layer

🔗 URL: https://www.iec.ch/dyn/www/f?p=103:38:615499235431339:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:20537,23,103719

ABSTRACT: This part of IEC 63203-801 specifies the ultra-low power physical layer (PHY) Smart BAN. As the use of wearables and connected body sensor devices grows rapidly in the Internet of Things (IoT), Wireless Body Area Networks (BAN) facilitate the sharing of data in smart environments such as smart homes, smart life etc. In specific areas of digital healthcare, wireless connectivity between the edge computing device or hub coordinator and the sensing nodes requires a standardized communication interface and protocols. The present document describes the Physical Layer (PHY) specifications: (1) packet formats; (2) modulation; (3) forward error correction

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: Under develop-ment

IEC 63203-801-2 Wearable electronic devices and technologies - Part 801-2: Smart Body Area Network (SmartBAN) - Low Complexity Medium Access Control (MAC) for SmartBAN

🔗 URL: https://www.iec.ch/dyn/www/f?p=103:38:615499235431339:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:20537,23,103720

ABSTRACT: This part of IEC 63203-801 specifies low complexity Medium Access Control (MAC) for SmartBAN. As the use of wearables and connected body sensor devices grows rapidly in the Internet of Things (IoT), Wireless Body Area Networks (BAN) facilitate the sharing of data in smart environments such as smart homes, smart life etc. In specific areas of digital healthcare, wireless connectivity between the edge computing device or hub coordinator and the sensing nodes requires a standardized communication interface and protocols. The present document describes the MAC specifications: (1) Channel Structure, (2) MAC Frame Formats, (3) MAC functions.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: Under develop-ment

ISO/CD 24227 Accuracy evaluation protocol for daily living walking speed extracted from sensor systems that measure human body motion

 **URL:** www.iso.org/standard/78134.html

ABSTRACT: This document focuses on the System Architecture - Accuracy evaluation protocol for daily living walking speed extracted from sensor systems that measure human body motion.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under develop-ment

ITU-T H.831 (01/2015) Conformance testing: WAN Interface Part 1: Web services interoperability: Sender

 **URL:** <https://handle.itu.int/11.1002/1000/12249>

ABSTRACT: The scope of this document is to provide Test Suite Structure and Test Purposes (TSS & TP) for WAN Interface based on the requirements defined in Continua Specifications. In particular, this document focuses on Web services interoperability: Sender side. The objective of this test specification is to provide a high probability of air interface interoperability between different devices.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-01

ITU-T H.832 (01/2015) Conformance testing: WAN Interface Part 2: Web services interoperability: Receiver

 **URL:** <https://handle.itu.int/11.1002/1000/12250>

ABSTRACT: The scope of this document is to provide Test Suite Structure and Test Purposes (TSS & TP) for WAN Interface based on the requirements defined in Continua Specifications. In particular, this document focuses on Web services interoperability: Receiver side. The objective of this test specification is to provide a high probability of air interface interoperability between different devices.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-01

ITU-T H.833 (01/2015) Conformance testing: WAN Interface Part 3: SOAP/ATNA: Sender

 **URL:** <https://handle.itu.int/11.1002/1000/12251>

ABSTRACT: The scope of this document is to provide Test Suite Structure and Test Purposes (TSS & TP) for WAN Interface based on the requirements defined in Continua Specifications. In particular, this document focuses on Simple Object Access Protocol / Audit Trail and Node Authentication (SOAP/ATNA): Sender side. The objective of this test specification is to provide a high probability of air interface interoperability between different devices.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-01

ITU-T H.834 (01/2015) Conformance testing: WAN Interface Part 4: SOAP/ATNA: Receiver

 **URL:** <https://handle.itu.int/11.1002/1000/12252>

ABSTRACT: The scope of this document is to provide Test Suite Structure and Test Purposes (TSS & TP) for WAN Interface based on the requirements defined in Continua Specifications. In particular, this document focuses on Simple Object Access Protocol / Audit Trail and Node Authentication (SOAP/ATNA): Receiver side. The objective of this test specification is to provide a high probability of air interface interoperability between different devices.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-01

ITU-T H.835 (01/2015) Conformance testing: WAN Interface Part 5: PCD-01 HL7 Messages: Sender

 **URL:** <https://handle.itu.int/11.1002/1000/12253>

ABSTRACT: The scope of this document is to provide Test Suite Structure and Test Purposes (TSS & TP) for WAN Interface based on the requirements defined in Continua Specifications. In particular, this document focuses on Patient Care Device (PCD)-01 HL7 Messages: Sender side. The objective of this test specification is to provide a high probability of air interface interoperability between different devices.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-01

ITU-T H.836 (01/2015) Conformance testing: WAN Interface Part 6: PCD-01 HL7 Messages: Receiver

 **URL:** <https://handle.itu.int/11.1002/1000/12254>

ABSTRACT: The scope of this document is to provide Test Suite Structure and Test Purposes (TSS & TP) for WAN Interface based on the requirements defined in Continua Specifications. In particular, this document focuses on Patient Care Device (PCD)-01 HL7 Messages: Receiver side. The objective of this test specification is to provide a high probability of air interface interoperability between different devices.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-01

ITU-T H.837 (01/2015) Conformance testing: WAN Interface Part 7: Consent Management: Sender

 **URL:** <https://handle.itu.int/11.1002/1000/12255>


ABSTRACT: The scope of this document is to provide Test Suite Structure and Test Purposes (TSS & TP) for WAN Interface based on the requirements defined in Continua Specifications. In particular, this document focuses on Consent Management: Sender side. The objective of this test specification is to provide a high probability of air interface interoperability between different devices.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2015-01

Home

oneM2M TR-0022-V2.0.0 Continuation & integration of HGI Smart Home activities

 **URL:** https://onem2m.org/images/files/deliverables/Release2/TR-0022-Continuation_and_Integration_of_HGI_Smart_Home_activities-V2_0_0.pdf

ABSTRACT: The present document is a study of the continuation and integration of some HGI Smart Home activities into oneM2M, following the (PT2) HGI announcement of its closure by June 2016. It includes the description of HGI SH deliverables versus the appropriate oneM2M deliverables for the integration of these HGI achievements.

It intends to be used as a liaison working document with HGI about the status progress of this continuation and integration and is expected to be useful for both HGI and oneM2M to check that all technical items from HGI SH Task Force expected to be integrated are appropriately handled by oneM2M.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2016-08

Horizontal & Verticals

bioTope D6.6 V1.0 Proof-of-Concept “Helsinki Pilot” Implementation

 **URL:** <https://storage.ning.com/topology/rest/1.0/file/get/35619980?profile=original>

ABSTRACT: This report describes in detail the goals and the use case of an Helsinki pilot, architecture of the solution, the relation to the other use cases, the current state of implementation, demonstrated scenarios, and the plan to accomplish the implementation from the demo stage to the final solution. The proof of concept and demonstration of the current stage of implementation has been shown by a demonstrator that consists of three components: Client Android app, O-MI Reference implemented Agent, and the charging hardware box. The basic scenario of searching and selection of a suitable charging station in the area has been implemented and shown.


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2018-02

CEN EN 13757-1 Communication systems for meters - Part 1: Data exchange

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=CEN:110:0:::FSP_PROJECT,FSP_ORG_ID:65216,6275&cs=1520E24EB7BA8E7321D0D175C7F1CF004

ABSTRACT: This document specifies data exchange and communications for meters in a generic way. This document establishes a protocol specification for the Application Layer for meters and establishes several protocols for meter communications which can be applied depending on the application being fulfilled. This document also specifies the overall structure of the Object Identification System (OBIS) and the mapping of all commonly used data items in metering equipment to their identification codes. NOTE Electricity meters are not covered by this document, as the standardization of remote readout of electricity meters is a task for CENELEC/IEC.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-12

CEN EN 13757-2 Communication systems for meters - Part 2: Wired M-Bus communication

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=CEN:110:0:::FSP_PROJECT,FSP_ORG_ID:61821,6275&cs=148E2A53815B1043A00AB94D1340B84A1

ABSTRACT: This draft European standard is applicable to the physical and link layer parameters of baseband communication over twisted pair (M Bus) for meter communication systems. It is especially applicable to thermal energy meters, heat cost allocators, water meters and gas meters. **NOTE:** It is usable also for other meters (like electricity meters) and for sensors and actuators. For generic descriptions concerning communication systems for meters and remote reading of meters see EN 13757-1.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-10

CEN EN 13757-5 Communication systems for meters - Part 5: Wireless M-Bus relaying

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=CEN:110:0:::FSP_PROJECT,FSP_ORG_ID:36150,6275&cs=1B9B9291A8674B58CF77F96F8B88F5B85

ABSTRACT: This European Standard specifies the protocols to use when performing relaying in wireless meter readout networks. This European Standard is an extension to wireless meter readout specified in EN 13757-4. It supports the routing of modes P and Q, and simple single-hop repeating of modes S, T, C, F and N. The main use of this standard is to support simple retransmission as well as routed wireless networks for the readout of meters. **NOTE:** Electricity meters are not covered by this standard, as the standardisation of remote readout of electricity meters is a task for IEC/CENELEC.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-05

CEN EN 16836-1 Communication systems for meters - Wireless mesh networking for meter data exchange - Part 1: Introduction and standardization framework

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=CEN:110:0:::FSP_PROJECT,FSP_ORG_ID:41098,6275&cs=11019FC07793E83E7C3B39E9E3A6DBF78

ABSTRACT: This European Standard gives the standardization framework of communication systems applicable to the exchange of data from metering devices to other devices within a mesh network. This European Standard specifies how to interpret prEN 16836-2:2015 and prEN 16836-3:2015 which give a list of references to the ZigBee documents. This series is applicable to communications systems that involve messages and networking between a meter or multiple meters and other devices in a mesh network, such as in home displays (IHDs) and communications hubs. This European Standard allows routing between devices and also allows channel agility to avoid contention with other networks of the same type, or indeed networks of other types operating in the same frequency bands. This European Standard is designed to support low power communications for devices such as gas and water meters which can make data from such devices available on the mesh network at any time through a proxy capability within a permanently powered device.

 **DOCUMENT TYPE:** Standard_Specification


 **PUBLICATION DATE:** 2017-05

CEN prEN 14154-4 Water meters — Part 4: Additional functionalities

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT,FSP_LANG_ID:73396,25&cs=1DA0D2906520CD899CB94F5BB61C72E7F

ABSTRACT: This document specifies definitions, requirements and testing of additional functionalities for water meters, without metrological impact, in combination with Additional Functionality Devices (AFD) and in response to EU/EFTA Mandate M/441 EN. These AFDs are considered as “ancillary devices” as defined in EN ISO 4064 1:2017 and EN ISO 4064 4:2014.

This document does not cover the changing of metrological software within the meter or the upload/download of metrological software.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under develop-ment

Eclipse Foundation Eclipse IoT-Testware


 **URL:** <https://projects.eclipse.org/projects/technology.iottestware>

ABSTRACT: It is the aim of the project to supply a rich set of TTCN-3 test suites and test cases for IoT technologies to enable developers in setting up a comprehensive test environment of their own, if needed from the beginning of a project. TTCN-3 has been defined and standardized by the European Telecommunication Standards Institute in ETSI ES 201873 and related extension packages. It is implemented and supported in Eclipse IoT by the Eclipse Titan project.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** N/A

ETSI TR 103 674 SmartM2M; Artificial Intelligence and the oneM2M architecture

 **URL:** http://www.etsi.org/deliver/etsi_tr/103600_103699/103674/01.01.01_60/tr_103674v010101p.pdf

ABSTRACT: Detailed description of selected use cases and identification of architectural evolutions (components, required mappings, etc.) to the oneM2M framework.


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2021-02

ETSI TR 103 714 SmartM2M; Study for oneM2M; Discovery and Query use cases and requirements

 **URL:** http://www.etsi.org/deliver/etsi_tr/103700_103799/103714/01.01.01_60/tr_103714v010101p.pdf

ABSTRACT: this work will identify additional requirements to be potentially submitted to oneM2M in the areas of discovery and query languages (syntax and semantic), by means of the development of relevant use cases. As a minimum, this work should include discovery of specific information and of aggregated information, and interaction with external sources of data and queries. The oneM2M architecture, the oneM2M semantic approach, the current oneM2M capabilities and SAREF will be at the basis of these use cases and requirements.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2020-07

ETSI TR 103 717 SmartM2M; Study for oneM2M; Discovery and Query specification development


 **URL:** http://www.etsi.org/deliver/etsi_tr/103700_103799/103717/01.01.01_60/tr_103717v010101p.pdf

ABSTRACT: This work will develop the specification for the discovery solution selected in DTR/SmartM2M-123151. This deliverable will document the specification while the real standardisation proposal will be contributed to oneM2M TS-0001 (Architecture), oneM2M TS-0034 (Semantic support), oneM2M TS-0033 (Interworking Framework), oneM2M TS-0004 (Protocols) (other oneM2M TS may be also impacted) with the help of the supporting companies active in oneM2M.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2021-07

ETSI TS 103 246-1 Satellite Earth Stations and Systems (SES); GNSS based location systems; Part 1: Functional requirements

 **URL:** http://www.etsi.org/deliver/etsi_ts/103200_103299/10324601/01.03.01_60/ts_10324601v010301p.pdf

ABSTRACT: This standard addresses integrated location systems that combine Global Navigation Satellite Systems (GNSS), with other navigation technologies, as well as with telecommunication networks in order to deliver location-based services to users. The requirements are intended to address the growing use of complex location systems needed for the provision of location-based applications particularly for the mass-market (refer to ETSI TR 103 183).

The standard defines the functional requirements applicable to location systems, based on a synthesis of types of applications relying on location-related data provided by location system. It can be considered as the Stage 1 characterization of location systems according to the ITU/3GPP approach (Recommendation ITU-T I.130).

It is the first part of a multi-part standard, with Part 1: Functional requirements; Part 2: Reference Architecture; Part 3: Performance requirements; Part 4: Requirements for location data exchange protocols; Part 5: Performance Test Specification.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-10

IEC Internet of Things: Wireless Sensor Networks

 **URL:** <https://www.iec.ch/basecamp/internet-things-wireless-sensor-networks>


ABSTRACT: Wireless sensor networks (WSN) are generating increasing interest from industry and research. This is driven by the availability of inexpensive, low-powered miniature components such as processors, radios and sensors which are sometimes integrated on a single chip. The idea of the Internet of Things (IoT) developed in parallel to WSNs. While IoT doesn't assume a specific communication technology, wireless communication technologies will play a major role in the roll-out of IoT. WSNs will drive many applications and many industries. This white paper discusses the use and evolution of WSNs in the wider context of IoT. It provides a review of WSN applications, infrastructures technologies, applications as well as standards that apply to WSN designs.

The white paper was prepared by the IEC Market Strategy Board (MSB) wireless sensor networks project team in cooperation with the US National Institute of Standards and Technology (NIST).

 **DOCUMENT TYPE:** Whitepaper

 **PUBLICATION DATE:** 2014-11

IEC 61987-31 ED1 List of Properties (LOP) of infrastructure devices for electronic data exchange – Generic structures

 **URL:** https://www.iec.ch/ords/f?p=103:38:401030832849310:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:1452,23,102292

ABSTRACT: This document focuses on the list of properties of infrastructure devices for electronic data exchange – Generic structures. This document is Under develop-ment.

 **DOCUMENT TYPE:** Standard_Specification


 **PUBLICATION DATE:** Under develop-ment

IEEE Transdisciplinary Framework for 5G-Enabled Applications and Services

 **URL:** <https://standards.ieee.org/industry-connections/transdisciplinary-framework-5g/>

ABSTRACT: The goal of this activity is to develop a structured, sustainable communication framework that is flexible, adaptable, and scalable for newer ecosystems. This framework is intended to be formulaic and can be extended for different ecosystems and may be used by governments, industry, and academia.

 **DOCUMENT TYPE:** Framework

 **PUBLICATION DATE:** Under develop-ment

IETF draft-ietf-asdf-sdf Semantic Definition Format (SDF) for Data and Interactions of Things

 **URL:** <https://datatracker.ietf.org/doc/draft-ietf-asdf-sdf/>

ABSTRACT: In this document, an SDF specification describes definitions of SDF Objects and their associated interactions (Events, Actions, Properties), as well as the Data types for the information exchanged in those interactions.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-02

IETF draft-ietf-rats-tpm-based-network-device-attest TPM-based Network Device Remote Integrity Verification

 **URL:** <https://datatracker.ietf.org/doc/draft-ietf-rats-tpm-based-network-device-attest/>

ABSTRACT: This document describes a workflow for remote attestation of the integrity of firmware and software installed on network devices that contain Trusted Platform Modules [TPM1.2], [TPM2.0], as defined by the Trusted Computing Group (TCG)), or equivalent hardware implementations that include the protected capabilities, as provided by TPMs.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-03

IETF draft-ietf-rats-yang-tpm-charra A YANG Data Model for Challenge-Response-based Remote Attestation Procedures using TPMs.

 **URL:** <https://datatracker.ietf.org/doc/draft-ietf-rats-yang-tpm-charra/>

ABSTRACT: This document defines YANG Remote Procedure Calls (RPCs) and a few configuration nodes required to retrieve attestation evidence about integrity measurements from a device, following the operational context defined in Trusted Platform Modules (TPM)-based Network Device Remote Integrity Verification.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-03

IETF draft-ietf-raw-architecture Reliable and Available Wireless Architecture

 **URL:** <https://datatracker.ietf.org/doc/draft-ietf-raw-architecture/>

ABSTRACT: This document defines the RAW Architecture following an Observe, Orient, Decide & Act (OODA) loop that involves Operation, Administration, and Maintenance (OAM), PCE, PSE and PAREO functions. It builds on the DetNet Architecture and discusses specific challenges and technology considerations needed to deliver DetNet service utilizing scheduled wireless segments and other media, e.g., frequency/time-sharing physical media resources with stochastic traffic.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-03

IETF draft-ietf-raw-framework Reliable and Available Wireless Framework

 **URL:** <https://datatracker.ietf.org/doc/draft-ietf-raw-framework/>

ABSTRACT: Reliable and Available Wireless Framework following an Observe, Orient, Decide & Act (OODA) loop that involves OAM, PCE, PSE and PAREO functions.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2021-11

IETF draft-ietf-raw-industrial-requirements Requirements for Reliable Wireless Industrial Services

 **URL:** <https://datatracker.ietf.org/doc/draft-ietf-raw-industrial-requirements/>

ABSTRACT: This document provides an overview on communication requirements for handling reliable wireless services within the context of industrial environments.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2021-12

IETF draft-ietf-raw-ldacs L-band Digital Aeronautical Communications System (LDACS)

 **URL:** <https://datatracker.ietf.org/doc/draft-ietf-raw-ldacs/>

ABSTRACT: This document gives an overview of the architecture of the L-band Digital Aeronautical Communications System (LDACS), which provides a secure, scalable and spectrum efficient terrestrial data link for civil aviation.

🔗 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2022-03

🔗 IETF draft-ietf-raw-oam-support Operations, Administration and Maintenance (OAM) features for RAW

🔗 URL: <https://datatracker.ietf.org/doc/draft-ietf-raw-oam-support/>

ABSTRACT: This document lists the requirements of the Operation, Administration, and Maintenance (OAM) features are recommended to construct a predictable communication infrastructure on top of a collection of wireless segments.

🔗 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2022-03

🔗 IETF draft-morais-iotops-inxu Intra-Network eXposure analyzer Utility Specification

🔗 URL: <https://datatracker.ietf.org/doc/draft-morais-iotops-inxu/>

ABSTRACT: This document proposes the Intra-Network eXposure analyzer Utility (INXU) as a vulnerability management solution for IoT networks.

🔗 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2021-01

🔗 IETF RFC 8352 Energy-Efficient Features of Internet of Things Protocols

🔗 URL: <https://datatracker.ietf.org/doc/rfc8352/>

ABSTRACT: This document describes the challenges for energy-efficient protocol operation on constrained devices and the current practices used to overcome those challenges

🔗 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2018-02

🔗 IETF RFC 8366 A Voucher Artifact for Bootstrapping Protocols

🔗 URL: <https://datatracker.ietf.org/doc/rfc8366/>

ABSTRACT: This document defines a strategy to securely assign a pledge to an owner using an artifact signed, directly or indirectly, by the pledge's manufacturer. This artifact is known as a "voucher".


🔗 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2018-05

IETF RFC 8428 Sensor Measurement Lists (SenML)

 **URL:** <https://datatracker.ietf.org/doc/rfc8428/>

ABSTRACT: This specification defines a format for representing simple sensor measurements and device parameters in Sensor Measurement Lists (SenML). Representations are defined in JavaScript Object Notation (JSON), Concise Binary Object Representation (CBOR), Extensible Markup Language (XML), and Efficient XML Interchange (EXI), which share the common SenML data model. A simple sensor, such as a temperature sensor, could use one of these media types in protocols such as HTTP or the Constrained Application Protocol (CoAP) to transport the measurements of the sensor or to be configured.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-08

IETF RFC 8747 Proof-of-Possession Key Semantics for CBOR Web Tokens (CWTs)

 **URL:** <https://datatracker.ietf.org/doc/rfc8747/>

ABSTRACT: This specification describes how to declare in a CBOR Web Token (CWT) (which is defined by RFC 8392) that the presenter of the CWT possesses a particular proof-of-possession key. Being able to prove possession of a key is also sometimes described as being the holder-of-key. This specification provides equivalent functionality to “Proof-of-Possession Key Semantics for JSON Web Tokens (JWTs)” (RFC 7800) but using Concise Binary Object Representation (CBOR) and CWTs rather than JavaScript Object Notation (JSON) and JSON Web Tokens (JWTs).

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-03

IETF RFC 8768 Constrained Application Protocol (CoAP) Hop-Limit Option

 **URL:** <https://datatracker.ietf.org/doc/rfc8768/>

ABSTRACT: This document specifies the Hop-Limit CoA option.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-03

IETF RFC 8778 Use of the HSS/LMS Hash-Based Signature Algorithm with CBOR Object Signing and Encryption (COSE)

 **URL:** <https://datatracker.ietf.org/doc/rfc8778/>

ABSTRACT: This document specifies the conventions for using the Hierarchical Signature System (HSS) / Leighton-Micali Signature (LMS) hash-based signature algorithm with the CBOR Object Signing and Encryption (COSE) syntax. The HSS/LMS algorithm is one form of hash-based digital signature; it is described in RFC 8554.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-04

IETF RFC 8790 FETCH and PATCH with Sensor Measurement Lists (SenML)

 **URL:** <https://datatracker.ietf.org/doc/rfc8790/>

ABSTRACT: This document defines new media types for the CoAP FETCH, PATCH, and iPATCH methods for resources represented using the SenML data model.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-06

IETF RFC 8798 Additional Units for Sensor Measurement Lists (SenML)

 **URL:** <https://datatracker.ietf.org/doc/rfc8798/>

ABSTRACT: This document registers a number of additional unit names in the IANA registry for units in SenML. It also defines a registry for secondary units that cannot be in SenML's main registry, as they are derived by linear transformation from units already in that registry.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-06

IETF RFC 8824 Static Context Header Compression (SCHC) for the Constrained Application Protocol (CoAP)

 **URL:** <https://datatracker.ietf.org/doc/rfc8824/>

ABSTRACT: This document defines how to compress Constrained Application Protocol (CoAP) headers using the Static Context Header Compression and fragmentation (SCHC) framework


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-06

IETF RFC 8928 Address-Protected Neighbor Discovery for Low-Power and Lossy Networks

 **URL:** <https://datatracker.ietf.org/doc/rfc8928/>

ABSTRACT: This document updates the IPv6 over Low-Power Wireless Personal Area Network (6LoWPAN) Neighbor Discovery (ND) protocol defined in RFCs 6775 and 8505. The new extension is called Address-Protected Neighbor Discovery (AP-ND), and it protects the owner of an address against address theft and impersonation attacks in a Low-Power and Lossy Network (LLN). Nodes supporting this extension compute a cryptographic identifier (Crypto-ID), and use it with one or more of their Registered Addresses. The Crypto-ID identifies the owner of the Registered Address and can be used to provide proof of ownership of the Registered Addresses. Once an address is registered with the Crypto-ID and a proof of ownership is provided, only the owner of that address can modify the registration information, thereby enforcing Source Address Validation


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-11

IETF RFC 8930 On Forwarding 6LoWPAN Fragments over a Multi-Hop IPv6 Network

 **URL:** <https://datatracker.ietf.org/doc/rfc8930/>

ABSTRACT: This document provides generic rules to enable the forwarding of an IPv6 over Low-Power Wireless Personal Area Network (6LoWPAN) fragment over a route-over network. Forwarding fragments can improve both end-to-end latency and reliability as well as reduce the buffer requirements in intermediate nodes; it may be implemented using RFC 4944 and Virtual Reassembly Buffers (VRBs).


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-11

IETF RFC 8931 IPv6 over Low-Power Wireless Personal Area Network (6LoWPAN) Selective Fragment Recovery

 **URL:** <https://datatracker.ietf.org/doc/rfc8931/>

ABSTRACT: This document updates RFC 4944 with a protocol that forwards individual fragments across a route-over mesh and recovers them end to end, with congestion control capabilities to protect the network.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-11

IETF RFC 8938 Deterministic Networking (DetNet) Data Plane Framework

 **URL:** <https://datatracker.ietf.org/doc/rfc8938/>

ABSTRACT: This document provides an overall framework for the Deterministic Networking (DetNet) data plane. It covers concepts and considerations that are generally common to any DetNet data plane specification. It describes related Controller Plane considerations as well.


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2020-11

IETF RFC 8939 Deterministic Networking (DetNet) Data Plane: IP

 **URL:** <https://datatracker.ietf.org/doc/rfc8939/>

ABSTRACT: This document specifies the Deterministic Networking (DetNet) data plane operation for IP hosts and routers that provide DetNet service to IP-encapsulated data.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-11

IETF RFC 8974 Extended Tokens and Stateless Clients in the Constrained Application Protocol (CoAP)

 **URL:** <https://datatracker.ietf.org/doc/rfc8974/>

ABSTRACT: This document provides considerations for alleviating Constrained Application Protocol (CoAP) clients and intermediaries of keeping per-request state. To facilitate this, this document

additionally introduces a new, optional CoAP protocol extension for extended token lengths.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2020-01

IETF RFC 8990 GeneRic Autonomic Signaling Protocol (GRASP)

🔗 URL: <https://datatracker.ietf.org/doc/rfc8990/>

ABSTRACT: This document specifies the GeneRic Autonomic Signaling Protocol (GRASP), which enables autonomic nodes and Autonomic Service Agents to dynamically discover peers, to synchronize state with each other, and to negotiate parameter settings with each other.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2021-05

IETF RFC 8991 GeneRic Autonomic Signaling Protocol Application Program Interface (GRASP API)

🔗 URL: <https://datatracker.ietf.org/doc/rfc8991/>

ABSTRACT: This document is a conceptual outline of an application Programming Interface (API) for the GeneRic Autonomic Signaling Protocol (GRASP).

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2021-05

IETF RFC 8993 A Reference Model for Autonomic Networking

🔗 URL: <https://datatracker.ietf.org/doc/rfc8993/>

ABSTRACT: This document describes a reference model for Autonomic Networking for managed networks.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2021-05

IETF RFC 8994 An Autonomic Control Plane (ACP)

🔗 URL: <https://datatracker.ietf.org/doc/rfc8994/>

ABSTRACT: This document defines such a plane and calls it the “Autonomic Control Plane”, with the primary use as a control plane for autonomic functions.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2021-05

IETF RFC 9006 TCP Usage Guidance in the Internet of Things (IoT)

🔗 URL: <https://datatracker.ietf.org/doc/rfc9006/>

ABSTRACT: This document provides guidance on how to implement and use the Transmission Control Protocol (TCP) in Constrained-Node Networks (CNNs), which are a characteristic of the Internet of Things (IoT).

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2021-03

IETF RFC 9100 Sensor Measurement Lists (SenML) Features and Versions

URL: <https://datatracker.ietf.org/doc/rfc9100/>

ABSTRACT: This short document updates RFC 8428, “Sensor Measurement Lists (SenML)”, by specifying the use of independently selectable “SenML Features” and mapping them to SenML version numbers.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2021-08

IETF RFC 9124 A Manifest Information Model for Firmware Updates in Internet of Things (IoT) Devices

URL: <https://datatracker.ietf.org/doc/rfc9124/>

ABSTRACT: This document describes the information that must be present in the manifest.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2022-01

IETF RFC 9164 Concise Binary Object Representation (CBOR) Tags for IPv4 and IPv6 Addresses and Prefixes

URL: <https://datatracker.ietf.org/doc/rfc9164/>

ABSTRACT: This specification defines two Concise Binary Object Representation (CBOR) tags for use with IPv6 and IPv4 addresses and prefixes.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2021-12

IETF RFC 9165 Additional Control Operators for the Concise Data Definition Language (CDDL)

URL: <https://datatracker.ietf.org/doc/rfc9165/>

ABSTRACT: The present document defines a number of control operators that were not yet ready at the time RFC 8610 was completed: .plus, .cat, and .det for the construction of constants; .abnf/abnfb for including ABNF (RFC 5234 and RFC 7405) in CDDL SPecifications; and .feature for indicating the use of a non-basic feature in an instance.


DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2021-12

IETF RFC 9175 Constrained Application Protocol (CoAP): Echo, Request-Tag, and Token Processing

 **URL:** <https://datatracker.ietf.org/doc/rfc9175/>

ABSTRACT: This document specifies enhancements to the Constrained Application Protocol (CoAP) that mitigate security issues in particular use cases.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2022-03

IETF RFC 9222 Guidelines for Autonomic Service Agents

 **URL:** <https://datatracker.ietf.org/doc/rfc9222/>

ABSTRACT: This document proposes guidelines for the design of Autonomic Service Agents for autonomic networks.


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-03

IETF RFC7400 6LoWPAN-GHC: Generic Header Compression for IPv6 over Low-Power Wireless Personal Area Networks (6LoWPANs)

 **URL:** <https://datatracker.ietf.org/doc/rfc7400/>

ABSTRACT: RFC 6282 defines header compression in 6LoWPAN packets (where “6LoWPAN” refers to “IPv6 over Low-Power Wireless Personal Area Network”). The present document specifies a simple addition that enables the compression of generic headers and header-like payloads, without a need to define a new header compression scheme for each such new header or header-like payload.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2014-11

IETF RFC7416 A Security Threat Analysis for the Routing Protocol for Low-Power and Lossy Networks (RPLs)

 **URL:** <https://datatracker.ietf.org/doc/rfc7416/>

ABSTRACT: This document presents a security threat analysis for the Routing Protocol for Low-Power and Lossy Networks (RPLs). The development builds upon previous work on routing security and adapts the assessments to the issues and constraints specific to low-power and lossy networks. A systematic approach is used in defining and evaluating the security threats. Applicable countermeasures are application specific and are addressed in relevant applicability statements.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2015-01

IETF RFC7428 Transmission of IPv6 Packets over ITU-T G.9959 Networks

 **URL:** <https://datatracker.ietf.org/doc/rfc7428/>

ABSTRACT: This document describes the frame format for transmission of IPv6 packets as well as a

method of forming IPv6 link-local addresses and statelessly autoconfigured IPv6 addresses on ITU-T G.9959 networks.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2015-02

IETF RFC7554 Using IEEE 802.15.4e Time-Slotted Channel Hopping (TSCH) in the Internet of Things (IoT): Problem Statement

🌐 URL: <https://datatracker.ietf.org/doc/rfc7554/>

ABSTRACT: This document describes the environment, problem statement, and goals for using the Time-Slotted Channel Hopping (TSCH) Medium Access Control (MAC) protocol of IEEE 802.15.4e in the context of Low-Power and Lossy Networks (LLNs). The set of goals enumerated in this document form an initial set only.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2015-05

IETF RFC7641 Observing Resources in the Constrained Application Protocol (CoAP)

🌐 URL: <https://datatracker.ietf.org/doc/rfc7641/>

ABSTRACT: This document specifies a simple protocol extension for CoAP that enables CoAP clients to “observe” resources, i.e., to retrieve a representation of a resource and keep this representation updated by the server over a period of time. The protocol follows a best-effort approach for sending new representations to clients and provides eventual consistency between the state observed by each client and the actual resource state at the server.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2015-09

IETF RFC7668 IPv6 over BLUETOOTH(R) Low Energy

🌐 URL: <https://datatracker.ietf.org/doc/rfc7668/>

ABSTRACT: Bluetooth Smart is the brand name for the Bluetooth low energy feature in the Bluetooth specification defined by the Bluetooth Special Interest Group. The standard Bluetooth radio has been widely implemented and available in mobile phones, notebook computers, audio headsets, and many other devices. The low-power version of Bluetooth is a specification that enables the use of this air interface with devices such as sensors, smart meters, appliances, etc. The low-power variant of Bluetooth has been standardized since revision 4.0 of the Bluetooth specifications, although version 4.1 or newer is required for IPv6. This document describes how IPv6 is transported over Bluetooth low energy using IPv6 over Low-power Wireless Personal Area Network (6LoWPAN) techniques.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2015-01

IETF RFC7731 Multicast Protocol for Low-Power and Lossy Networks (MPL)

🌐 URL: <https://datatracker.ietf.org/doc/rfc7731/>

ABSTRACT: This document specifies the Multicast Protocol for Low-Power and lossy Networks (MPL), which

provides IPv6 multicast forwarding in constrained networks. MPL avoids the need to construct or maintain any multicast forwarding topology, disseminating messages to all MPL Forwarders in an MPL Domain.

🔗 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2016-02

IETF RFC7732 Forwarder Policy for Multicast with Admin-Local Scope in the Multicast Protocol for Low-Power and Lossy Networks (MPL)

🔗 URL: <https://datatracker.ietf.org/doc/rfc7732/>

ABSTRACT: The purpose of this document is to specify an automated policy for the routing of Multicast Protocol for Low-Power and Lossy Networks (MPL) multicast messages with Admin-Local scope in a border router.

🔗 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2016-02

IETF RFC7744 Use Cases for Authentication and Authorization in Constrained Environments

🔗 URL: <https://datatracker.ietf.org/doc/rfc7744/>

ABSTRACT: This document includes a collection of representative use cases for authentication and authorization in constrained environments. These use cases aim at identifying authorization problems that arise during the life cycle of a constrained device and are intended to provide a guideline for developing a comprehensive authentication and authorization solution for this class of scenarios.

🔗 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2016-02

IETF RFC7774 Multicast Protocol for Low-Power and Lossy Networks (MPL) Parameter Configuration Option for DHCPv6

🔗 URL: <https://datatracker.ietf.org/doc/rfc7774/>

ABSTRACT: This document defines a way to configure a parameter set for MPL (Multicast Protocol for Low-Power and Lossy Networks) via a DHCPv6 option. MPL has a set of parameters to control its behavior, and the parameter set is often configured as a network-wide parameter because the parameter set should be identical for each MPL Forwarder in an MPL Domain. Using the MPL Parameter Configuration Option defined in this document, a network can easily be configured with a single set of MPL parameters.

🔗 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2016-03

IETF RFC7959 Block-Wise Transfers in the Constrained Application Protocol (CoAP)

🔗 URL: <https://datatracker.ietf.org/doc/rfc7959/>

ABSTRACT: this specification extends basic CoAP with a pair of “Block” options for transferring multiple blocks of information from a resource representation in multiple request-response pairs. In

many important cases, the Block options enable a server to be truly stateless: the server can handle each block transfer separately, with no need for a connection setup or other server-side memory of previous block transfers. Essentially, the Block options provide a minimal way to transfer larger representations in a block-wise fashion.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2016-08

IRTF draft-choi-icnrg-aiot Requirements and Challenges for User-level Service Managements of IoT Network by utilizing Artificial Intelligence

🔗 URL: <https://datatracker.ietf.org/doc/draft-choi-icnrg-aiot/>

ABSTRACT: This document describes the requirements and challenges to employ artificial intelligence (AI) into the constraint Internet of Things (IoT) service environment for embedding intelligence and increasing efficiency.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2022-12

IRTF RFC 9139 Information-Centric Networking (ICN) Adaptation to Low-Power Wireless Personal Area Networks (LoWPANs)

🔗 URL: <https://datatracker.ietf.org/doc/rfc9139/>

ABSTRACT: This document defines a convergence layer for Content-Centric Networking (CCNx) and Named Data Networking (NDN) over IEEE 802.15.4 Low-Power Wireless Personal Area Networks (LoWPANs)

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2021-11

ISO/IEC 30169 Information technology — Internet of Things (IoT) — IoT applications for electronic label system (ELS)

🔗 URL: <https://webstore.iec.ch/publication/66659>

ABSTRACT: This document applies to the design and development of the IoT applications for ELS. The IoT applications for ELS specified in this document are mainly applicable to the retail industry, and can also provide reference for the design and development of the IoT applications for ELS in other industries.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2022-05

ISO/IEC TR 30172 Information technology — Internet of Things (IoT) — Digital twin - Use Cases

🔗 URL: https://www.iec.ch/ords/f?p=103:38:411250985150323:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:20486,23,104881

ABSTRACT: This document provides a collection of representative use cases of Digital Twin applications in a variety of domains, e.g., smart manufacturing, smart cities, etc. This document is

applicable to all types of organizations (e.g., commercial enterprises, government agencies, not-for-profit organizations).

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: Under develop-ment

ISO/IEC TR 30176:2021 Internet of Things (IoT) - Integration of IoT and DLT/blockchain: Use cases

🔗 URL: <https://webstore.iec.ch/publication/66420>

ABSTRACT: This report identifies and collects use cases for the integration of the DLT/blockchain within IoT systems, applications, and/or services. The use cases presented in this document use the IoT use case template.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2021-11

ISO/IEC TS 30168 Information technology - Internet of Things (IoT) - Generic Trust Anchor Application Programming Interface for Industrial IoT Devices

🔗 URL: https://www.iec.ch/ords/f?p=103:38:411250985150323:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:20486,23,104067

ABSTRACT: This document specifies a generic application programming interface (API) for the integration of secure elements within Industrial IoT (IIoT) devices. It considers needs from industrial usage scenarios and applications. This document also provides guidance for implementation, testing, and conformity validation.

This specification provides a versatile Application Programming Interface (API) for security to allow a generic integration of secure elements (SE) into Industrial IoT devices. The API is vendor independent and independent regarding the secure element technology being deployed. This allows easy redesign for different secure elements and supports software-hardware co-design for security. The API aims at achieving high level abstraction profiles for security services and mechanisms to avoid typical low-level interoperability complexity and implementation failures. Requirements and architectural constraints from Industrial IoT applications will dominate the final design of the API and its usability.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: Under develop-ment

ITU-T Y.4112/Y.2077 (02/2016) Requirements of the Plug and Play Capability of the IoT

🔗 URL: <https://handle.itu.int/11.1002/1000/12706>

ABSTRACT: The document specifies the common requirements for the plug and play capability of the IoT. More specifically, this recommendation covers the followings: a) Concept and scope of plug and play capability of the IoT; b) Plug and play use cases of the IoT; c) Functional requirements for the plug and play capability of the IoT; d) System requirements for the plug and play capability of the IoT.


📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2016-02

ITU-T Y.4113 (09/2016) Requirements of the network for the Internet of Things

 **URL:** <https://handle.itu.int/11.1002/1000/13025>

ABSTRACT: This recommendation describes the requirements of the network for the Internet of things (IoT). The common requirements of the IoT described in [ITU-T Y.4100] are high-level; thus this Recommendation is complementary to [ITU-T Y.4100] in term of specific requirements of the network for the IoT.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-09

Eclipse OM2M Eclipse OM2M v1.4.1 - Open-Source platform for M2M communication

 **URL:** <https://www.eclipse.org/om2m/>

ABSTRACT: The Eclipse OM2M project, initiated by LAAS-CNRS, is an open-source implementation of oneM2M and SmartM2M standard. It provides a horizontal M2M service platform for developing services independently of the underlying network, with the aim to facilitate the deployment of vertical applications and heterogeneous devices.

 **DOCUMENT TYPE:** Open_Source

 **PUBLICATION DATE:** 2012-02

NGI-Trust EDGE-TINC

 **URL:** <https://edge-tinc.gitlab.io/fluentic/>

ABSTRACT: The Edge-TINC project is developing the networking stack and all the required protocols to enable in-network nodes that possess CPU capacity to accommodate requests for computation.

 **DOCUMENT TYPE:** EU & National funded Open Source projects

 **PUBLICATION DATE:** Under develop-ment

NGI-Trust IZI

 **URL:** <https://github.com/mizolotu/izi>

ABSTRACT: The IZI project implements a prototype of a defense framework relying on advanced technologies that have recently emerged in the area of software-defined networking (SDN) and network function virtualization (NFV) for IoT devices.

 **DOCUMENT TYPE:** EU & National funded Open Source projects


 **PUBLICATION DATE:** Under develop-ment

NGI-Trust PY

 **URL:** <https://www.panga.fr/>

ABSTRACT: The PY project focuses on the network architecture of connected buildings and cities Local networks to transform buildings and cities into a service platform for their users and managers.

 **DOCUMENT TYPE:** EU & National funded Open Source projects

 **PUBLICATION DATE:** Under develop-ment

NGI-Trust Totem


 **URL:** <https://insigh.io/>

ABSTRACT: The Totem project develops a set of innovations along with open hardware devices and software applications/tools that will enable the holistic monitoring of the connected home network activities, identify and prevent potential security/trust breaches.

 **DOCUMENT TYPE:** EU & National funded Open Source projects

 **PUBLICATION DATE:** Under develop-ment

OMA-AD-CPNS-V1_1-20160209-A Converged Personal Network Service Architecture


 **URL:** https://www.openmobilealliance.org/release/CPNS/V1_1-20160209-A/OMA-AD-CPNS-V1_1-20160209-A.pdf

ABSTRACT: The scope of the CPNS (Converged Personal Network Service) architecture document is to define the architecture for the CPNS v1.1 Enabler. This document provides the functional capabilities needed to support the Enabler as described in CPNS requirements document [CPNS-RD].

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2016-02

OMA-AD-DM-V2_0-20160209-A Device Management Architecture

 **URL:** https://www.openmobilealliance.org/release/DM/V2_0-20160209-A/OMA-AD-DM-V2_0-20160209-A.pdf

ABSTRACT: The scope of the Device Management architecture document is to define the architecture for the Device Management v2.0 enabler. This document fulfils the functional capabilities and information flows needed to support this enabler as described in the Device Management requirements document.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2016-02

OMA-AD-FUMO-V1_0-20070209-A Firmware Update Management Object Architecture


 **URL:** https://www.openmobilealliance.org/release/FUMO/V1_0_4-20090828-A/OMA-AD-FUMO-V1_0-20070209-A.pdf

ABSTRACT: The scope of this document is the architecture for the Firmware Update Management Object (FUMO) specifications. In general, the scope includes the DM server environment, download mechanisms and devices.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2007-02

OMA-AD-GwMO-V1_1-20170725-A Gateway Management Object Architecture

 **URL:** https://www.openmobilealliance.org/release/GwMO/V1_1-20170725-A/OMA-AD-GwMO-V1_1-20170725-A.pdf

ABSTRACT: The scope of the Gateway Management Object architecture document is to define the architecture for the DM Gateway Management Object v1.1 enabler. This document fulfills the functional capabilities and information flows needed to support this enabler as described in the Gateway Management Object requirements document [GwMO-RD].

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2017-07

OMA-AD-OpenCMAPI-V1_0-20160126-A Open Connection Manager API Architecture


 **URL:** https://www.openmobilealliance.org/release/OpenCMAPI/V1_0-20160126-A/OMA-AD-OpenCMAPI-V1_0-20160126-A.pdf

ABSTRACT: This document provides the architecture for the OpenCMAPI Enabler. This architecture is based on the requirements as listed in the OpenCMAPI Requirement Document [OpenCMAPI-RD].

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2016-01

OMA-ERELD-CPNS-V1_1-20160209-A Enabler Release Definition for Converged Personal Network Service


 **URL:** https://www.openmobilealliance.org/release/CPNS/V1_1-20160209-A/OMA-ERELD-CPNS-V1_1-20160209-A.pdf

ABSTRACT: The scope of this document is limited to the Enabler Release Definition of Converged Personal Network Service (CPNS) enabler according to OMA Release process and the Enabler Release specification baseline listed in section 5. The CPNS Enabler enables CPNS entities in a personal network (PN) to consume services within that PN, services from and to other PNs, and services provided by service providers outside the PN.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2016-02

OMA-ERELD-DM-V2_0-20160209-A Enabler Release Definition for OMA Device Management


 **URL:** https://www.openmobilealliance.org/release/DM/V2_0-20160209-A/OMA-ERELD-DM-V2_0-20160209-A.pdf

ABSTRACT: The scope of this document is limited to the Enabler Release Definition of OMA Device Management v2.0 according to OMA Release process and the Enabler Release specification baseline listed in section 5.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2016-02

OMA-ERELED-FUMO-V1_0_4-20090828-A Enabler Release Definition for Firmware Update Management Object


 **URL:** https://www.openmobilealliance.org/release/FUMO/V1_0_4-20090828-A/OMA-ERELED-FUMO-V1_0_4-20090828-A.pdf

ABSTRACT: The scope of this document is limited to the Enabler Release Definition of Firmware Update Management Object specifications according to OMA Release process and the Enabler Release specification baseline listed in section 5.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2009-08

OMA-ERELED-GwMO-V1_1-20170725-A Enabler Release Definition for Gateway Management Object (GwMO)


 **URL:** https://www.openmobilealliance.org/release/GwMO/V1_1-20170725-A/OMA-ERELED-GwMO-V1_1-20170725-A.pdf

ABSTRACT: The scope of this document is limited to the Enabler Release Definition of Gateway Management Object (GwMO v1.1) according to OMA Release process and the Enabler Release specification baseline listed in section 5.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2017-07

OMA-ERELED-LightweightM2M-V1_2-20201110-A Enabler Release Definition for LightweightM2M

 **URL:** https://www.openmobilealliance.org/release/LightweightM2M/V1_2-20201110-A/OMA-ERELED-LightweightM2M-V1_2-20201110-A.pdf

ABSTRACT: The scope of this document is limited to the Enabler Release Definition of LightweightM2M v1.2 according to OMA Release process and the Enabler Release specification baseline.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2020-11

OMA-ERELED-LWM2M_BinaryAppDataCont-V1_0_1-20190221-A Enabler Release Definition for LwM2M BinaryAppDataCont


 **URL:** https://www.openmobilealliance.org/release/LwM2M_APPDATA/V1_0_1-20190221-A/OMA-ERELED-LWM2M_BinaryAppDataCont-V1_0_1-20190221-A.pdf

ABSTRACT: The scope of this document is limited to the Enabler Release Definition of LwM2M BinaryAppDataCont according to OMA Release process and the Enabler Release specification baseline listed in section 5.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2019-02

OMA-ERELD-LWM2M_Gateway-V1_1-20210518-A Enabler Release Definition for LWM2M Gateway

 **URL:** https://www.openmobilealliance.org/release/LwM2M_Gateway/V1_1-20210518-A/OMA-ERELD-LWM2M_Gateway-V1_1-20210518-A.pdf

ABSTRACT: The scope of this document is limited to the Enabler Release Definition of LWM2M_Gateway according to OMA Release process and the Enabler Release specification baseline listed in section 5.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2021-05

OMA-ERELD-OpenCMAPI-V1_0-20160126-A Enabler Release Definition for Open Connection Manager API


 **URL:** https://www.openmobilealliance.org/release/OpenCMAPI/V1_0-20160126-A/OMA-ERELD-OpenCMAPI-V1_0-20160126-A.pdf

ABSTRACT: The scope of this document is limited to the Enabler Release Definition of the Open Connection Manager API (OpenCMAPI) Enabler according to OMA Release process and the Enabler Release specification baseline listed in section 5.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2016-01

OMA-ER-GotAPI-V1_1-20180724-A Generic Open Terminal API Framework (GotAPI)

 **URL:** https://www.openmobilealliance.org/release/GOTAPI/V1_1-20180724-A/OMA-ER-GotAPI-V1_1-20180724-A.pdf

ABSTRACT: This Enabler Release (ER) document is a combined document that includes requirements, architecture and technical specification of the Generic Open Terminal API Framework (GotAPI) Enabler.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2018-07

OMA-ETS-LightweightM2M_INT-V1_1-20190912-D Enabler Test Specification (Interoperability) for Lightweight M2M

 **URL:** https://www.openmobilealliance.org/release/LightweightM2M/ETS/OMA-ETS-LightweightM2M-V1_1-20190912-D.pdf

ABSTRACT: This document describes in detail available test cases for LightweightM2M as specified in OMA-TS-LightweightM2MV1_1-20180710-A and OMA-TS-LightweightM2M_Transport-V1_1-20180710-A.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2019-08

OMA-EVP-LightweightM2M-V1_0-20140819-C Enabler Validation Plan for Lightweight M2M


 **URL:** https://www.openmobilealliance.org/release/LightweightM2M/EVP/OMA-EVP-LightweightM2M-V1_0-20140819-C.pdf

ABSTRACT: This document details the Validation plan for the Lightweight M2M V1.0 Enabler Release. The successful accomplishment of the validation activities will be required for the Enabler to be considered for Approved status.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2014-08

OMA-RD-CPNS-V1_1-20160209-A Converged Personal Network Service Requirements


 **URL:** https://www.openmobilealliance.org/release/CPNS/V1_1-20160209-A/OMA-RD-CPNS-V1_1-20160209-A.pdf

ABSTRACT: This Requirement Document (RD), i.e., [GwMO-RD], defines the requirements for the Converged Personal Network Service-CPNS 1.1 and deferred requirements that can be used as a base for future version of CPNS. The CPNS Enabler enables CPNS entities in a personal network (PN) to consume services within that PN, services from and to other PNs, and services provided by service providers outside the PN.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2016-02

OMA-RD-DM-V1_2-20070209-A Device Management Requirements

 **URL:** https://www.openmobilealliance.org/release/FUMO/V1_0_4-20090828-A/OMA-RD-DM-V1_2-20070209-A.pdf

ABSTRACT: The scope of this document is a requirements description for Device Management (for the definition of Device see section 3.2). This document describes a set of functional requirements (partly on an abstract level) for the management of a Device's changeable parameters, as seen from the Management Authority's points of view.


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2007-02

OMA-RD-DM-V2_0-20160209-A Device Management Requirements

 **URL:** https://www.openmobilealliance.org/release/DM/V2_0-20160209-A/OMA-RD-DM-V2_0-20160209-A.pdf

ABSTRACT: This document contains use cases and requirements for Device Management 2.0. It describes a set of functional requirements for the management of a Device. These functional requirements MAY be overlapped with the requirements for DM 1.x Enabler.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2016-02

OMA-RD-ENCap-M-V1_0-20180621-A Exposing Network Capabilities to M2M Requirements

 **URL:** https://www.openmobilealliance.org/release/ENCap/V1_0-20180621-A/OMA-RD-ENCap_M-V1_0-20180621-A.pdf

ABSTRACT: This document defines the requirements for Exposing Network Capabilities to M2M Applications and/or M2M Service Platforms through APIs. In addition, it contains: (1) Use cases where M2M Applications and/or M2M Service Platforms can leverage network capabilities to enrich the services or to streamline the operations; (2) Gap analysis to identify any missing Network APIs to address the above use cases.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2018-06

OMA-RD-GwMO-V1_1-20170725-A GwMO Requirements

 **URL:** https://www.openmobilealliance.org/release/GwMO/V1_1-20170725-A/OMA-RD-GwMO-V1_1-20170725-A.pdf

ABSTRACT: This document lists the complete set of requirements for the OMA DM Gateway Management Object Enabler v1.1. It includes all the requirement of the OMA DM GatewayMO v1.0. It mainly focuses on requirements to enable a DM Server to manage devices that are not directly accessible to the OMADM Server (for example, because the devices are deployed behind a firewall or because the devices do not support the OMA DM protocol). This document also provides requirements for management of devices in a Machine to Machine (M2M) ecosystem (for example, fanning out DM commands from a DM Server to multiple End Devices and aggregating responses from multiple End Devices so that a consolidated response is sent back to the DM Server).

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2017-07

OMA-RD-LightweightM2M-V1_2-20201110-A OMA Lightweight Machine to Machine Requirements

 **URL:** https://www.openmobilealliance.org/release/LightweightM2M/V1_2-20201110-A/OMA-RD-LightweightM2M-V1_2-20201110-A.pdf

ABSTRACT: This document represents Lightweight M2M version 1.2 consolidated requirements.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2020-11

OMA-RD-M2MInterface-V1_0-20150324-A Management Interface for M2M Requirements

 **URL:** https://www.openmobilealliance.org/release/M2Minterface/V1_0-20150324-A/OMA-RD-M2MInterface-V1_0-20150324-A.pdf

ABSTRACT: This technical report defines requirements for an interface from Device Management (DM) server to the Machine to Machine (M2M) systems on top. This Northbound Interface (NBI) allows M2M service layer to access the DM server functionality. These requirements are derived from device and service management use cases.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2015-03

OMA-RD-OpenCMAPI-V1_0-20160126-A Open Connection Manager API Requirements


 **URL:** https://www.openmobilealliance.org/release/OpenCMAPI/V1_0-20160126-A/OMA-RD-OpenCMAPI-V1_0-20160126-A.pdf

ABSTRACT: This document defines the requirements for the OMA Open Connection Manager API (OpenCMAPI) V1.0.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2016-01

OMA-RRELD-ENCap-M2M-V1_0-20180621-A Reference Release Definition for Exposing Network Capabilities to M2M


 **URL:** https://www.openmobilealliance.org/release/ENCap/V1_0-20180621-A/OMA-RRELD-ENCap-M2M-V1_0-20180621-A.pdf

ABSTRACT: The scope of this document is limited to the Reference Release Definition of ENCap-M2M according to OMA Release process and the Reference Release specification baseline listed in section 5.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2018-06

OMA-RRELD-M2M_Device_Classification-V1_0-20121030-A Reference Release Definition for M2M Device Classification

 **URL:** https://www.openmobilealliance.org/release/M2M_Device_Classification/V1_0-20121030-A/OMA-RRELD-M2M_Device_Classification-V1_0-20121030-A.pdf

ABSTRACT: The scope of this document is limited to the Reference Release Definition of the M2M Device Classification White Paper Reference Release according to OMA Release process and the Reference Release document baseline listed in section 5.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2012-10

OMA-RRELD-M2Minterface-V1_0-20150324-A Reference Release Definition for M2Minterface


 **URL:** https://www.openmobilealliance.org/release/M2Minterface/V1_0-20150324-A/OMA-RRELD-M2Minterface-V1_0-20150324-A.pdf

ABSTRACT: The scope of this document is limited to the Enabler Release Definition of M2M interface according to OMA Release process and the Enabler Release specification baseline listed in section 5.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2015-03

OMA-TS-CPNS_Core-V1_1-20160209-A Converged Personal Network Service Core Technical Specification

 **URL:** https://www.openmobilealliance.org/release/CPNS/V1_1-20160209-A/OMA-TS-CPNS_Core-V1_1-20160209-A.pdf

ABSTRACT: This document specifies the functions, interfaces and behaviour of CPNS entities, then protocols and CPNS System concept together with syntax and semantics of CPNS messages.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2016-02

OMA-TS-DM_Protocol-V2_0-20160209-A OMA Device Management Protocol

📄 URL: https://www.openmobilealliance.org/release/DM/V2_0-20160209-A/OMA-TS-DM_Protocol-V2_0-20160209-A.pdf

ABSTRACT: This protocol is called the OMA Device Management Protocol version 2.0, and it defines the protocol for various management procedures. The scope for this protocol is to define the interfaces that are used between the DM Server and the DM Client. Interfaces residing within the device or within the server are outside of the scope of this specification.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2016-02

OMA-TS-DM-FUMO-V1_0_2-20090828-A Firmware Update Management Object

📄 URL: https://www.openmobilealliance.org/release/FUMO/V1_0_4-20090828-A/OMA-TS-DM_FUMO-V1_0_2-20090828-A.pdf

ABSTRACT: This document specifies management object(s) and their necessary behaviour to support the updating of firmware in mobile devices. It leverages the OMA DM enabler [OMADM] and supports alternate download mechanisms (such as OMA Download [DLOTA]). This represents the interface between the client and server required to manage the update of a mobile device's firmware.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2009-08

OMA-TS-DM-GwMO_ZigBeeMO-V1_0-20170725-A Management Objects for ZigBee Devices

📄 URL: https://www.openmobilealliance.org/release/GwMO/V1_1-20170725-A/OMA-TS-GwMO_ZigBeeMO-V1_0-20170725-A.pdf

ABSTRACT: This document defines an OMA DM management object (data model) to represent ZigBee devices. This ZigBee MO models specific parameters used to represent a specific ZigBee device and should be used together with GwMO TS v1.1 [GwMOTS]. This ZigBee MO is optional for any OMA DM Gateway implementation.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2017-07

OMA-TS-GwMO-V1_1-20170725-A Gateway Management Object Technical Specification

📄 URL: https://www.openmobilealliance.org/release/GwMO/V1_1-20170725-A/OMA-TS-GwMO-V1_1-20170725-A.pdf

ABSTRACT: This technical specification describes Management Objects and Generic Alerts that

are needed to provide the DM Gateway functionality, as defined in [DMDICT], i.e., OMA Device Management Dictionary.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2017-07

OMA-TS-LightweightM2M_Core-V1_2-20201110-A Lightweight Machine to Machine Technical Specification: Core

📄 URL: https://www.openmobilealliance.org/release/LightweightM2M/V1_2-20201110-A/OMA-TS-LightweightM2M_Core-V1_2-20201110-A.pdf

ABSTRACT: This document, the LwM2M CORE technical specification, describes the LwM2M messaging layer. The LwM2M TRANSPORT specification [LwM2M-TRANSPORT], a companion specification, details the mapping of the messaging layer to selected transports. The separation between transport and messaging layer improves readability and simplifies extending LwM2M to further transports. The LwM2M messaging layer uses a RESTful design with several interfaces and a simple data model.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2020-11

OMA-TS-LightweightM2M_Transport-V1_2-20201110-A Lightweight Machine to Machine Technical Specification: Transport Bindings

📄 URL: https://www.openmobilealliance.org/release/LightweightM2M/V1_2-20201110-A/OMA-TS-LightweightM2M_Transport-V1_2-20201110-A.pdf

ABSTRACT: This document specifies the transport bindings of the Lightweight Machine-to-Machine (LwM2M) protocol version 1.2. The split between the LwM2M core [LwM2M-CORE] and the transport binding specification improves readability, allows a cleaner separation between the LwM2M messaging layer and the underlying protocols for conveying these messages, and ultimately better extensibility.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2020-11

OMA-TS-LWM2M_BinaryAppDataContainer-V1_0_1-20190221-A Lightweight M2M – Binary App Data Container

📄 URL: https://www.openmobilealliance.org/release/LwM2M_APPDATA/V1_0_1-20190221-A/OMA-TS-LWM2M_BinaryAppDataContainer-V1_0_1-20190221-A.pdf

ABSTRACT: This document defines an Object to be used to transfer Application Data with the Lightweight M2M enabler in order to manage application service data on the device.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2019-02

OMA-TS-LWM2M_Gateway-V1_1-20210518-A Lightweight Machine to Machine Gateway Technical Specification

📄 URL: https://www.openmobilealliance.org/release/LwM2M_Gateway/V1_1-20210518-A/OMA-TS-LWM2M_Gateway-V1_1-20210518-A.pdf

ABSTRACT: This specification extends the LwM2M architecture to support the LwM2M Gateway functionality.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2021-05

OMA-TS-OpenCMAPI-V1_0-20160126-A Open Connection Manager API

URL: https://www.openmobilealliance.org/release/OpenCMAPI/V1_0-20160126-A/OMA-TS-OpenCMAPI-V1_0-20160126-A.pdf

ABSTRACT: This specification of the OpenCMAPI defines an interface, through which connection management services are made available to different applications.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2016-01

OMA-WP-M2M_Device_Classification-20121030-A White Paper on M2M Device Classification

URL: https://www.openmobilealliance.org/release/M2M_Device_Classification/V1_0-20121030-A/OMA-WP-M2M_Device_Classification-20121030-A.pdf

ABSTRACT: This document is to provide a Machine-to-Machine (M2M) device classification framework based on the horizontal attributes (e.g., wide area communication interface, local area communication interface, IP stack, human I/O capabilities, persistent configuration storage) of interest to communication service providers (CSPs) and M2M service providers (MSPs), independent of vertical markets, such as smart grid, connected cars, e-health, smart home, etc.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2012-10

oneM2M TR-0001-V4.3.0 Use Cases Collection

URL: <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=28153>

ABSTRACT: This oneM2M Technical Report includes a collection of use cases from various M2M industry segments. Use cases focus on the sequence of interactions among actors, and may include potential requirements.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2018-10

oneM2M TR-0024-V4.3.0 3GPP Interworking

URL: <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=31840>

ABSTRACT: The document is a study of interworking between oneM2M Architecture and 3GPP Rel-16 architecture for Service Capability Exposure as defined in TS 23.682.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2020-03

oneM2M TR-0033-Study_on_Enhanced_Semantic_Enabling-V4_5_0 Study on Enhanced Semantic Enabling

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=31093>

ABSTRACT: In this study requirements on enhanced semantic enabling and approaches for addressing these requirements will be developed and discussed. The intention is to achieve agreement between the interested participants on the approaches to be pursued in oneM2M. On this basis normative contributions to Technical Specifications can then be made.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2019-10

oneM2M TR-0046-V-0.9.0 Study on Public Warning Service Enabler

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=32834>

ABSTRACT: The present document studies public warning service enabler for oneM2M system including case studies of similar/existing solutions, oneM2M use cases and requirements, possible architecture enhancement, and security analysis. Also, this TR suggests abstract data models for public warning service over IoT technologies.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2019-09

oneM2M TR-0060-V-0.2.0 Study of action triggering enhancements

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=31865>

ABSTRACT: This work item defines how to autonomously send a series of commands to trigger actions based on the configuration of conditions by M2M application. As the extension to the previous work TR-0021, this TR focuses on Complex Event Processing support in oneM2M.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2020-02

oneM2M TR-0065 V0.1.0 oneM2M-SensorThings API interworking

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34408>

ABSTRACT: This document investigates in oneM2M-to-SensorThings API interworking.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2020-01

oneM2M TR-0067-V-0.2.0 Study on Management Object migration to SDT

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=33846>

ABSTRACT: The document is a study of how SDT <flexContainer> type resources could replace <mgmtObj> resources in the future.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2020-06

oneM2M TR-0068-V-0.2.0 AI enablement to oneM2M

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34206>

ABSTRACT: The document is analysing existing AI/ML technologies that can be resourced into oneM2M architecture. The document is also investigating potential AI/ML service use cases that use data collected in the oneM2M system. The study on existing AI/ML technologies and use cases are further analysed in this document to understand what features are supported and unsupported by the oneM2M system. Based on the result of this technical report, it will identify potential requirements and key features to enable AI/ML in the oneM2M system.

 **DOCUMENT TYPE:** Technical_Report

PUBLICATION DATE: 2021-11

oneM2M TS-0004-V4.9.0 Service Layer Core Protocol

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34618>

ABSTRACT: The present document specifies the communication protocol(s) for oneM2M compliant Systems, M2M Applications, and/or other M2M Systems. The present document also specifies common data formats, interfaces and message sequences to support reference points(s) defined by oneM2M.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-02

oneM2M TS-0005-V4.0.0 Management Enablement (OMA)

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=30113>

ABSTRACT: Specifies the usage of OMA DM and OMA LwM2M resources and the corresponding message flows including normal cases as well as error cases to fulfill the oneM2M management requirements.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2019-06

oneM2M TS-0006-V4.0.0 Management enablement (BBF)


 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=30114>

ABSTRACT: Specifies the usage of the BBF TR-069 protocol and the corresponding message flows including normal cases as well as error cases to fulfil the oneM2M management requirements.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2019-06

oneM2M TS-0008- V-4.2.0 CoAP Protocol Binding


 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34132>

ABSTRACT: The specification will cover the protocol specific part of communication protocol used by oneM2M compliant systems as 'CoAP binding'.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-10

oneM2M TS-0013-V.4.0.0 Interoperability Testing

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=33896>

ABSTRACT: The specification address the testing of the primitives on the oneM2M interfaces as specified in TS-0001 and TS-0004. The purpose of the interoperability testing is to prove end-to-end functionality between Application Entities and Common Service Entities over the Mca and Mcc reference points.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-07

oneM2M TS-0021-V2.0.0 oneM2M and AllJoyn Interworking

 **URL:** https://www.onem2m.org/images/files/deliverables/Release2/TS-0021-oneM2M_and_AllJoyn_Interworking-V2_0_0.pdf

ABSTRACT: This document specifies the oneM2M and AllJoyn interworking technologies.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-08

oneM2M TS-0022-V4_3_0 Field Device Configuration

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34724>

ABSTRACT: Field Device Configuration TS.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2022-04

oneM2M- TS-0023-V4.8.0 SDT based Information Model and Mapping for Vertical Industries


 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=33779>

ABSTRACT: This technical specification includes oneM2M defined information model for home appliances and the mapping with other information models from external organization.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-04

oneM2M TS-0024-V3.2.2 OCF Interworking

 **URL:** https://onem2m.org/images/files/deliverables/Release3/TS-0024-OCF_Interworking-V3_2_2.pdf

ABSTRACT: The present document specifies the interworking between oneM2M-specified entities and OCF-specified clients and/or servers.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2019-04

oneM2M TS-0026-V4.6.0 3GPP Interworking between oneM2M service layer and 3GPP features

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=33174>

ABSTRACT: This document specifies interworking between oneM2M service layer and 3GPP features, so that some 3GPP features can be exposed to oneM2M service layer for the benefit of IoT applications, and viceversa.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-12

oneM2M TS-0040-V0.1.0 Modbus Interworking

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=32500>

ABSTRACT: The present document specifies the oneM2M and Modbus interworking technologies that enable Modbus devices and oneM2M entities produce/consume services. This includes the interworking architecture model that describes where the Modbus Interworking Proxy Entity (IPE) is hosted and how the IPE is composed with. This document describes Modbus services to oneM2M resource mapping structure and rules, followed by describing detailed interworking procedures.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-07

oneM2M WI-0096 Effective IoT Communication to Protect 3GPP Networks

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=33091>

ABSTRACT: This Work Item is intended to produce a specification that describes how a oneM2M service layer hosted on a 3GPP Cellular IoT device ensures that the device operates in an efficient manner that applies the requirements described by GSMA TS.34.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-01

oneM2M WI-0102 System enhancements to support Data License Management

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=32157>

ABSTRACT: Proposes a work item to study oneM2M system enhancement to support data license management.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2020-05

oneM2M WI-0104 V0_0_1 SDT based Information Model and Mapping for Vertical Industries – SIMVI

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=33391>

ABSTRACT: The purpose of this Work Item is to enable the continuation of contributions of Information Models including ModuleClasses and Device models from various domains for TS-0023.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2021-03

oneM2M WI-0105 System enhancements to support AI capabilities

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=33772>

ABSTRACT: This work item aims to enable oneM2M to utilize Artificial Intelligence models and data management for AI services.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2021-06

oneM2M WI-0109 IPE-based Device Management with FlexContainers

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34558>

ABSTRACT: Propose a work item for Device Management (DMG) with IPE-based approach with FlexContainers.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2022-02

oneM2M-TR-0042-V-0.4.0 WoT Interworking

URL: <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=26945>

ABSTRACT: This technical report identifies the interworking scenarios and its requirements between oneM2M and W3C Web of Things systems and analyze possible architectural solutions to address the requirements.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2018-05

oneM2M-TR-0043-V-0.2.0 Modbus Interworking

URL: <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=30112>

ABSTRACT: This technical report investigates oneM2M and modbus interworking scenarios and proposes possible solutions to support the interworking scenarios.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2019-06

oneM2M-TR-0044-V-0.6.0 Physical object heterogeneous identification and tracking in oneM2M

URL: <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=31631>

ABSTRACT: This technical report investigates the various IoT ID standards and application requirements, discussion on how to be compatible with the IoT ID standards, and providing the heterogeneous identification and tracking services.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2020-02

oneM2M-TR-0053-V-0.6.0 Lightweight oneM2M Services

URL: <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=31776>

ABSTRACT: The document is a study of lightweight oneM2M services. Based on the result of the study, it identifies proposed optimizations and enhancements to the oneM2M system to streamline and optimize its features and services.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2020-03

oneM2M-TR-0054-V-0.8.0 oneM2M Service Subscribers and Users


 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=32207>

ABSTRACT: This document is a study on the definition of oneM2M service subscribers and their authorized users. This study explores use cases which require oneM2M service subscribers and users. The study also analyses different solutions to support oneM2M service subscribers and users.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2020-06

oneM2M-TR-0057-V-0.6.0 Getting Started with oneM2M

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=33407>

ABSTRACT: Getting Started with oneM2M.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2021-02

oneM2M-TR-0059-V-0.2.0 oneM2M Services and Platforms Discovery

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=30111>

ABSTRACT: The document is describing what services and platforms discovery scenarios are considered beneficial from a oneM2M standpoint and how these can be supported by oneM2M system. Based on the result of the technical report, it will identify possible advanced features and enhancements which the next oneM2M release(s) could support.


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2019-06

oneM2M TS-0018-V-4.6.0 Test Suite Structure and Test Purposes

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34702>

ABSTRACT: The Test Suite Structure and Test Purposes document for conformance testing consists of: Defining the test suite structure by grouping the test purposes according to different criteria; Specifying test purposes for conformance test. A test purpose is an informal description of the expected test behaviour.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2022-04

Open Group IT4IT Open Messaging Interface (O-MI), The Open Group Standard for the Internet of Things (IoT), Version 2.0

 **URL:** <https://publications.opengroup.org/c19e>

ABSTRACT: The Open Messaging Interface (O-MI) standard connectivity model is similar to that of the World-Wide Web (WWW). Where the WWW uses the HTTP protocol for transmitting HTML-coded information mainly intended for human users, O-MI requests are used for transmitting lifecycle-related information mainly intended for automated processing by information systems. A defining characteristic of the O-MI standard is that O-MI nodes do not have predefined roles, as it follows a “peer-to-peer” communications model

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2019-12

Open Group MSA-IoT Microservices Architecture for the Internet of Things (MSA-IoT)

 **URL:** <https://publications.opengroup.org/g187>

ABSTRACT: In this Guide, we will explore the synergies between these two evolving solutions, and identify where MSA can be an optimal fit, and an enabler to, IoT solutions. Patterns and critical decision factors relating to security and architecture will be considered, and the benefits of the MSA approach will be further highlighted in a series of case studies.

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** 2018-04

■ Manufacturing

IETF draft-km-iotops-iiot-frwk Virtualization of PLC in Industrial Networks - Problem Statement

 **URL:** <https://datatracker.ietf.org/doc/draft-km-iotops-iiot-frwk/>

ABSTRACT: This document introduces virtual PLC concept, describes the details and benefits of virtualized PLCs, then focuses on the problem statement and requirements.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-03

C2C-CC C2CCC_RS_2037 Vehicle C-ITS station profile

🔗 **URL:** https://www.car-2-car.org/fileadmin/documents/Basic_System_Profile/Release_1.6.1/C2CCC_RS_2037_Profile.pdf

ABSTRACT: For interoperability, each sub-system of Cooperative Intelligent Transport System (C-ITS) (vehicle, roadside, personal and central) requires a specific set of standards, called system profile, defining in which way possible options of the related standards are implemented. Thus, the system profile describes external interfaces matching those of other sub-systems where communication is intended. This document provides all requirements related to the features of a vehicle C-ITS station to enable Inter-sub-system interoperability. In terms of Car 2 Car Communication Consortium (C2C-CC) each requirement details a feature (which again details an objective) and provides its implementation details. In some cases, requirements are written in a way which let the implementation open, for example if they refer to very specific parts of a vehicle. Those requirements have to be further detailed by anybody implementing that requirement. Beside these special requirements, all other requirements can be further detailed, too.

📄 **DOCUMENT TYPE:** Standard_Specification

📅 **PUBLICATION DATE:** 2021-12

C2C-CC C2CCC_TR_2000_ReleaseOverview - Basic System Profile Release Overview, Release 1.6.1

🔗 **URL:** https://www.car-2-car.org/fileadmin/documents/Basic_System_Profile/Release_1.6.1/C2CCC_TR_2000_ReleaseOverview.pdf

ABSTRACT: This Release Overview provides information on the specification which are part of this release, like: a) which deliverables are part of the release or; b) what are the changes since the last release. Furthermore, C2C-CC has published a large set of white papers, studies and technical reports which can be found at <https://www.car-2-car.org/documents/general-documents/>. Publications from external sources, but yet related to the work of C2C-CC, are also available at <https://www.car-2-car.org/documents/publications/>

📄 **DOCUMENT TYPE:** Technical_Report

📅 **PUBLICATION DATE:** 2021-12

CEN ISO/TS 17425:2016 Intelligent transport systems - Cooperative systems - Data exchange specification for in-vehicle presentation of external road and traffic related data

🔗 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:35914&cs=10C18F278124980B9F4075E355AB45BC3

ABSTRACT: This document defines the In-Vehicle Signage service and application that delivers In-Vehicle Signage information to ITS stations (vehicle ITS stations or personal ITS stations devices) concerning road and traffic conditions, qualified by road authorities/operators, in a consistent way with road authority's/operator's requirements, in the manner that is coherent with the information that would be displayed on a road sign or variable message sign (VMS).

📄 **DOCUMENT TYPE:** Standard_Specification

📅 **PUBLICATION DATE:** 2016-06

CEN ISO/TS 17429:2017 Intelligent transport systems - Cooperative ITS - ITS station facilities for the transfer of information between ITS stations

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:35915&cs=1DF674B52BAF01613FICDAABBB1D408E6

ABSTRACT: ISO/TS 17429:2017 specifies generic mechanisms enabling the exchange of information between ITS stations for applications related to Intelligent Transport Systems. It complies with the ITS station reference architecture (ISO 21217) and defines the following ITS station facilities layer functionalities:

- (1) Communication Profile Handler (CPH);
- (2) Content Subscription Handler (CSH);
- (3) Facilities Services Handler (FSH).

These functionalities are used by ITS-S application processes (ITS-S-AP) to communicate with other ITS-S application processes and share information. These functionalities describe:

- (1) how lower-layer communication services assigned to a given data flow are applied to the service data units at the various layers in the communication protocol stack (CPH, see 6.2.3),
- (2) how content from data dictionaries can be published and subscribed to by ITS-S application processes (CSH, see 6.2.5),
- (3) how well-known ITS station facilities layer and management services can be applied to application process data units (FSH, see 6.2.4), relieving (ITS-S) application processes from having to implement these services on their own,
- (4) how service access points (SAP) primitives specified in ISO 24102-3 are used,
- (5) service primitives for the exchange of information between ITS-S application processes and the ITS station facilities layer (FA-SAP), and
- (6) a set of communication requirements and objectives (profiles) using the methods defined in ISO/TS 17423 to select the level of performance (best effort or real-time, etc.), confidence and security (authentication, encryption, etc.) for information exchange between ITS stations, such as data provision, event notification, roadside configuration, map update.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-04

CEN ISO/TS 19091:2019 Intelligent transport systems - Cooperative ITS - Using V2I and I2V communications for applications related to signalized intersections

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:64994&cs=155A0F218787309EC4D33F96797394306

ABSTRACT: This document defines the message, data structures, and data elements to support exchanges between the roadside equipment and vehicles to address applications to improve safety, mobility and environmental efficiency. In order to verify that the defined messages will satisfy these applications, a systems engineering process has been employed that traces use cases to requirements and requirements to messages and data concepts. This document consists of a single document that contains the base specification and a series of annexes. The base specification lists the derived information requirements (labelled informative) and references to other standards for message definitions where available. Annex A contains descriptions of the use cases addressed by this document. Annexes B and C contain traceability matrices that relate use cases to requirements and requirements to the message definitions (i.e. data frames and data elements). The next annexes list the base message requirements and application-oriented specific requirements (requirements traceability matrix) that map to the message and data concepts to be implemented. As such, an implementation consists of the base plus an additional group of extensions within this document. Details on information requirements, for other than SPaT, MAP, SSM, and SRM messages are provided in other International Standards. The focus of this document is to specify the details of the SPaT,

MAP, SSM, and SRM supporting the use cases defined in this document. Adoption of these messages varies by region and their adoption can occur over a significant time period. This document covers the interface between roadside equipment and vehicles. Applications, their internal algorithms, and the logical distribution of application functionality over any specific system architecture are outside the scope of this document.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2019-07

CEN ISO/TS 19321:2020 Intelligent transport systems - Cooperative ITS - Dictionary of in-vehicle information (IVI) data structures

🔗 URL: https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:68350&cs=1FE9288D0BD55B9A6A45F662E5E523F64

ABSTRACT: This document specifies the in-vehicle information (IVI) data structures that are required by different intelligent transport system (ITS) services for exchanging information between ITS Stations (ITS-S). A general, extensible data structure is specified, which is split into structures called containers to accommodate current-day information. Transmitted information includes IVI such as contextual speed, road works warnings, vehicle restrictions, lane restrictions, road hazard warnings, location-based services, re-routing. The information in the containers is organized in sub-structures called data frames and data elements, which are described in terms of its content and its syntax. The data structures are specified as communications agnostic. This document does not provide the communication protocols. This document provides scenarios for usage of the data structure, e.g. in case of real time, short-range communications.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2020-10

CEN ISO/TS 19321:2020 Intelligent transport systems - Cooperative ITS - Dictionary of in-vehicle information (IVI) data structures

🔗 URL: https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT:68350&cs=1FE9288D0BD55B9A6A45F662E5E523F65

ABSTRACT: This document specifies the in-vehicle information (IVI) data structures that are required by different intelligent transport system (ITS) services for exchanging information between ITS Stations (ITS-S). A general, extensible data structure is specified, which is split into structures called containers to accommodate current-day information. Transmitted information includes IVI such as contextual speed, road works warnings, vehicle restrictions, lane restrictions, road hazard warnings, location-based services, re-routing. The information in the containers is organized in sub-structures called data frames and data elements, which are described in terms of its content and its syntax. The data structures are specified as communications agnostic. This document does not provide the communication protocols. This document provides scenarios for usage of the data structure, e.g. in case of real time, short-range communications.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2020-10

CEN prCEN ISO/TS 19321 rev Intelligent transport systems — Cooperative ITS — Dictionary of in-vehicle information (IVI) data structures


 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT,FSP_LANG_ID:73937,25&cs=108B9C05FB54333B566ACFD5122C7E1F9

ABSTRACT: This document specifies the in-vehicle information (IVI) data structures that are required by different intelligent transport system (ITS) services for exchanging information between ITS Stations (ITS-S). A general, extensible data structure is specified, which is split into structures called containers to accommodate current-day information. Transmitted information includes IVI such as contextual speed, road works warnings, vehicle restrictions, lane restrictions, road hazard warnings, location-based services, re-routing. The information in the containers is organized in sub-structures called data frames and data elements, which are described in terms of its content and its syntax. The data structures are specified as communications agnostic. This document does not provide the communication protocols. This document provides scenarios for usage of the data structure, e.g. in case of real time, short-range communications.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under develop-ment

ETSI EN 302 636-1 ITS; Vehicular Communications; GeoNetworking; Part 1: Requirements


 **URL:** http://www.etsi.org/deliver/etsi_en/302600_302699/30263601/01.02.01_60/en_30263601v010201p.pdf

ABSTRACT: This document is the first part of a multi-part standard. It specifies the general, functional and performance requirements that apply to the GeoNetworking protocols. It is applicable to ITS stations implementing ETSI ITS for both single hop and multi-hop communications.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2014-04

ETSI EN 302 637-2 ITS; Vehicular Communications; Basic Set of Applications; Part 2: Specification of Cooperative Awareness Basic Service


 **URL:** http://www.etsi.org/deliver/etsi_en/302600_302699/30263702/01.04.01_60/en_30263702v010401p.pdf

ABSTRACT: Cooperative awareness within road traffic means that road users and roadside infrastructure are informed about each other's position, dynamics and attributes. Road users are all kind of road vehicles like cars, trucks, motorcycles, bicycles or even pedestrians and roadside infrastructure equipment including road signs, traffic lights or barriers and gates. The awareness of each other is the basis for several road safety and traffic efficiency applications with many use cases as described in ETSI TR 102 638. It is achieved by regular exchange of information among vehicles (V2V, in general all kind of road users) and between vehicles and road side infrastructure (V2I and I2V) based on wireless networks, called V2X network and as such is part of Intelligent Transport Systems (ITS). The information to be exchanged for cooperative awareness is packed up in the periodically transmitted Cooperative Awareness Message (CAM). The construction, management and processing of CAMs is done by the Cooperative Awareness basic service (CA basic service), which is part of the facilities layer within the ITS communication architecture.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2019-04

ETSI EN 302 637-3 ITS; Vehicular Communications; Basic Set of Applications; Part 3: Specifications of Decentralized Environmental Notification Basic Service


 **URL:** http://www.etsi.org/deliver/etsi_en/302600_302699/30263703/01.03.01_60/en_30263703v010301p.pdf

ABSTRACT: The DEN basic service is an application support facility provided by the ITS facilities layer. It constructs, manages and processes the Decentralized Environmental Notification Message (DENM). The construction of a DENM is triggered by an ITS-S application. A DENM contains information related to a road hazard or an abnormal traffic conditions, such as its type and its position. Typically for an ITS application, a DENM is disseminated to ITS-S that are located in a geographic area through communications among ITS stations. At the receiving side, the DEN basic service of an receiving ITS-S processes the received DENM and provides the DENM content to an ITS-S application.

 **DOCUMENT TYPE:** Standard_Specification


 **PUBLICATION DATE:** 2019-04

ETSI EN 302 663 ITS; ITS-G5 Access layer specification for Intelligent Transport Systems operating in the 5 GHz frequency band

 **URL:** http://www.etsi.org/deliver/etsi_en/302600_302699/302663/01.03.01_60/en_302663v010301p.pdf


ABSTRACT: The present document specifies the European profile of the physical and medium access control sub-layer of 5 GHz intelligent transport systems (ITS) using IEEE 802.11 as the base standard. One of the additionally selected functionalities being an essential part of the present document is “communication outside the context of a BSS” as developed by IEEE 802.11.

Communication outside the context of a BSS enables exchange of data frames between stations that are not members of a BSS. This type of communication allows for immediate exchange of data frames, avoiding the latency associated with the establishment of a BSS.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-01

ETSI EN 303 613 ITS; LTE-V2X Access layer specification for Intelligent Transport Systems operating in the 5 GHz frequency band


 **URL:** http://www.etsi.org/deliver/etsi_en/303600_303699/303613/01.01.01_60/en_303613v010101p.pdf

ABSTRACT: This document specifies the access layer for the LTE-V2X technology.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-01

ETSI TR 101 607 ITS; Cooperative ITS (C-ITS); Release 1

 **URL:** http://www.etsi.org/deliver/etsi_tr/101600_101699/101607/01.02.01_60/tr_101607v010201p.pdf

ABSTRACT: For the development of standards which address Cooperative Intelligent Transport Systems (C-ITS) a release oriented process has been adopted. The present document lists standards, specifications and other deliverables which have been developed to form a consistent set of standards as the basis for Release 1 including standards for interoperability developed in accordance with the work plan of the European Commission Standardisation Mandate M/453.

The deliverables forming Release 1 are synchronized and harmonized with similar documents prepared by other SDOs such as ISO/CEN, IEEE and SAE. The present document also serves as basis for defining further standardization activities which will lead to forming the Release 2 of standards related to Cooperative ITS.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2020-02

ETSI TR 102 638 ITS; Vehicular Communications; Basic Set of Applications; Release 2

🔗 URL: http://www.etsi.org/deliver/etsi_tr/102600_102699/102638/01.01.01_60/tr_102638v010101p.pdf

ABSTRACT: This document is currently under revision to document the Release 2 set of standards.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2009-06

ETSI TS 103 544-1 Publicly Available Specification (PAS); ITS; MirrorLink; Part 1: Connectivity

🔗 URL: http://www.etsi.org/deliver/etsi_ts/103500_103599/10354401/01.03.01_60/ts_10354401v010301p.pdf

ABSTRACT: Definition of the lower layer wired and wireless connectivity protocols for MirrorLink. Integration of change requests based on feedback from plugfests and initial implementations undergoing CCC's MirrorLink device certification program.

This document is the first part of a multi-part standard made of 29 specifications (TS 103 544-n).

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2019-10

ITU-T F.749.1 (11/2015) Functional requirements for vehicle gateway

🔗 URL: <https://handle.itu.int/11.1002/1000/12631>

ABSTRACT: This recommendation specifies functional requirements for vehicle gateway (VG), including transport functional requirements, networking functional requirements, network access functional requirements, communication-with-in-vehicle devices functional requirements, and network access management & security functional requirements. It also describes communications interfaces to support the seamless wired and wireless connectivity in the heterogeneous access network environments.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2015-11

ITU-T F.749.2 (03/2017) Service requirements for vehicle gateway platforms

🔗 URL: <https://handle.itu.int/11.1002/1000/13183>

ABSTRACT: This recommendation provides the service description, application scenarios and requirements for Vehicle Gateway Platforms. A series of Recommendations for Vehicle Gateway Platforms is currently opened in ITU- T SC 16. This recommendation is part of that series and gives the service description, application scenarios and requirements.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2017-03

oneM2M TR-0055-3GPP_V2X_Interworking-V0_5_0 3GPP V2X Interworking

URL: <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=30468>

ABSTRACT: The document is a study of interworking between oneM2M Architecture and 3GPP V2X architecture so that oneM2M can support V2X service for the benefit of IoT applications.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2019-07

oneM2M-TR-0058-V-0.0.1: Railway Domain Enablement

URL: <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=28240>

ABSTRACT: This Technical Report investigates how to enable oneM2M system working in the railway vertical domain. This TR includes use cases, studies on essential features and summaries of other standards organizations on the railway vertical domain for the next oneM2M release(s) which considers and supports railway domain devices and services.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2018-12

oneM2M TS-0036-V-0.0.1 Advanced Vehicular Domain Enablement

URL: <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=24640>

ABSTRACT: This document focuses on the Advanced Vehicular Domain Enablement.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2017-11

SmartCity_

ETSI TR 103 290 Machine-to-Machine communications (M2M); Impact of Smart City Activity on IoT Environment

URL: http://www.etsi.org/deliver/etsi_tr/103200_103299/103290/01.01.01_60/tr_103290v010101p.pdf

ABSTRACT: Smart City study would undertake compilation and review of activities taking place in the area of SMART City in Europe, Asia, and US. It will analyse the relevance of Smart City applications, and possible underlying network architecture. The report will describe use case descriptions for Smart City applications in context of but not limited to IoT communications.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2015-04

ETSI TS 103 424 Publicly Available Specification (PAS); Smart Machine-to-Machine communications (SmartM2M)

 **URL:** http://www.etsi.org/deliver/etsi_tr/103500_103599/103527/01.01.01_60/tr_103527v010101p.pdf

ABSTRACT: The Home Gateway Initiative (HGI) worked on Specifications for home connectivity and Services enablement, in particular to encompass a delivery framework for Smart Home services. The defined architecture includes support for a standard, general purpose software execution environment in the HG (for third party applications), API definitions, device abstraction and interfacing with Cloud based platforms. This specification defines a smart home system architecture and derives requirements for the Home Gateway.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-11

ITU-T Y.4805 (08/2017) Identifier service requirements for the interoperability of Smart City applications

 **URL:** <https://handle.itu.int/11.1002/1000/13267>

ABSTRACT: This recommendation specifies a set of requirements for identifier services in smart city applications with a view to ensure that such systems are interoperable and secure. This set of requirements may additionally serve as guidelines for developing new identifier services for smart city. It includes security features for service integrity, data confidentiality. The recommendation defines a full list of identifier service requirement, including security requirements, for the identifier service.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-08

CEN EN 13757-2:2018/prA1 Communication systems for meters - Part 2: Wired M-Bus communication

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT,FSP_LANG_ID:74544,25&cs=1761F4D6E55C0F87848EB2822BAF9FAAF

ABSTRACT: This draft European standard is applicable to the physical and link layer parameters of baseband communication over twisted pair (M Bus) for meter communication systems. It is especially applicable to thermal energy meters, heat cost allocators, water meters and gas meters. **NOTE:** It is usable also for other meters (like electricity meters) and for sensors and actuators. For generic descriptions concerning communication systems for meters and remote reading of meters see EN 13757-1.

 **DOCUMENT TYPE:** Standard_Specification


 **PUBLICATION DATE:** Under develop-ment

ISO/IEC 30142:2020 Internet of Things (IoT) - Underwater acoustic sensor network (UWASN) - Network management system overview and requirements

 **URL:** <https://webstore.iec.ch/publication/62443>

ABSTRACT: ISO/IEC 30142:2020 provides the overview and requirements of a network management system in underwater acoustic sensor network (UWASN) environment. It specifies the following:

- a) functions which support underwater network management system;
- b) entities required for underwater network management system;
- c) data about the communication between elements in underwater network management system;
- d) guidelines to model the underwater network management system;
- e) general and functional requirements of underwater network management system.

 **DOCUMENT TYPE:** Standard_Specification


 **PUBLICATION DATE:** 2020-06

ISO/IEC 30143:2020 Internet of Things (IoT) - Underwater acoustic sensor network (UWASN) - Application profiles

 **URL:** <https://webstore.iec.ch/publication/62405>

ABSTRACT: ISO/IEC 30143:2020 provides the guidelines for designing and developing new applications in the underwater environment such as fish farming, environment monitoring, harbour security, etc. This document also:

- a) provides the components required for developing the application;
- b) provides instructions for modelling the application with examples;
- c) helps the user to understand the communication between the elements in the application for modelling the communication between elements;
- d) guides the user with the design process of underwater applications.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-06

ISO/IEC 30171-1 Information technology — Internet of Things (IoT) — Base-station based Underwater Wireless Acoustic Network (B-UWAN) – Part 1: Overview and requirements

 **URL:** <https://webstore.iec.ch/publication/66927>

ABSTRACT: ISO/IEC 30171-1:2022 provides the general overview of base-station based underwater wireless acoustic networks (B-UWANs). It gives detailed description for main components of B-UWAN and also provides functions of B-UWAN components. It further specifies the requirements of B-UWAN.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2022-05

ISO/IEC TR 30167:2021 Internet of Things (IoT) - Underwater communication technologies for IoT

 **URL:** <https://webstore.iec.ch/publication/65619>

ABSTRACT: ISO/IEC TR 30167:2021 describes the enabling and driving technologies of underwater communication such as acoustic communication, optical communication, Very Low Frequency (VLF)/Extremely, Low Frequency (ELF) communication, and Magnetic Fusion Communication (MFC). This document also highlights: a) technical overview of different communication technologies; b) characteristics of different communication technologies; c) trends of different communication technologies; d) applications of each communication technology; e) benefits and challenges of each communication technology.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2021-06

■ Organization

■ Health

ITU-T H.821 (04/2017) Conformance of ITU-T H.810 personal health system: Healthcare information system interface

 **URL:** <https://handle.itu.int/11.1002/1000/13200>

ABSTRACT: The scope of this document is to provide Test Suite Structure and Test Purposes (TSS & TP) for HRN Interface based on the requirements defined in Continua Specifications. The objective of this test specification is to provide a high probability of air interface interoperability between different devices by HRN Interface to transfer patient information from a Continua WAN device (HRN Sender) to an Electronic Health Record device (HRN Receiver). This document only focuses on the TSS&TP for HRN Sender because, at this moment, HRN Receiver is out of the scope of Continua Certification Program.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-04

ITU-T H.841 (08/2020) Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 1: Optimized Exchange Protocol: Personal Health Device

 **URL:** <https://handle.itu.int/11.1002/1000/14344>

ABSTRACT: This recommendation provides a test suite structure (TSS) and the test purposes (TP) for personal health devices using the IEEE 11073-20601 optimized exchange protocol in the Personal Health Devices (PHD) interface, based on the requirements defined in the Recommendations of the ITU-T H.810 sub-series, of which Recommendation ITU-T H.810 (2017) is the base Recommendation. The objective of this test specification is to provide a high probability of interoperability at this interface.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-08

ITU-T H.843 (08/2018) Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 3: Continua Design Guidelines: Personal Health Device

 **URL:** <https://handle.itu.int/11.1002/1000/13680>


ABSTRACT: The scope of this document is to provide Test Suite Structure and Test Purposes (TSS & TP) for PAN/LAN Interface based on the requirements defined in Continua Specifications. The objective of this test specification is to provide a high probability of air interface interoperability between different devices.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-08

■ Horizontals & Verticals

ENISA Good practices for IoT and Smart Infrastructures Tool

 **URL:** <https://www.enisa.europa.eu/topics/iot-and-smart-infrastructures/iot-good-practices-for-iot-and-smart-infrastructures-tool>

ABSTRACT: This tool intends to provide an aggregated view of the ENISA Good Practices for IoT and Smart Infrastructure that have been published the last years.

 **DOCUMENT TYPE:** Database

 **PUBLICATION DATE:** N/A

IEC role in the IoT


 **URL:** <https://www.iec.ch/basecamp/iec-role-iot>

ABSTRACT: This brochure provides a detailed overview of IEC work that directly impacts the Internet of Things. It explains why standardization is needed for the M2M world of Connected Services. The important role of sensors and MEMS. How nanotechnology will impact IoT. Big Data and the cloud and why data privacy and security will increase in importance and how cyber security work can help. How the IoT applies in energy and the Smart Grid, smart buildings and homes, lighting as well as Smart Cities. How IEC work contributes to smart manufacturing and Industry 4.0. and why IoT will become more important in healthcare, personal safety, mobility and even for universal energy access, for example through LVDC.

 **DOCUMENT TYPE:** Presentation


 **PUBLICATION DATE:** 2018-10

ISO/IEC PWI JTC1-SC41-7 Digital Twin – Maturity model

 **URL:** https://www.iec.ch/dyn/www/f?p=103:38:204774363295796:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:20486,23,108352

ABSTRACT: This document provides a standardized generic Digital Twin maturity model, definition of assessment indicators, guidance for a maturity assessment, and other practical classifications of Digital Twin capabilities, etc.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** Under development

ISO/IEC TR 30164:2020 Internet of Things (IoT) - Edge computing

 **URL:** <https://webstore.iec.ch/publication/62522>

ABSTRACT: ISO/IEC TR 30164:2020 describes the common concepts, terminologies, characteristics, use cases and technologies (including data management, coordination, processing, network functionality, heterogeneous computing, security, hardware/software optimization) of edge computing for IoT systems applications. This document is also meant to assist in the identification of potential areas for standardization in edge computing for IoT.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2020-04

■ Privacy and Security

■ Built Environment

CENELEC CLC/prTS 50491-7 Home and Building Electronic Systems - IT security and data protection - User Guide

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=305:110:0:::FSP_PROJECT,FSP_LANG_ID:75291,25&cs=1AC4B90B75A5026B198062B2BBB1F96BE

ABSTRACT: This Technical Specification provides guidance to set-up and manage/update a cybersecure HBES / BACS system. This document provides: 1) Categories of HBES / BACS networks related to cybersecurity updates (managed and unmanaged networks) 2) Risk assessment guide for the above-mentioned categories (at device level for both managed and unmanaged networks, at system level for managed ones only) For manufacturers the document provides a classification scheme based on the security levels from existing standards (ETSI EN 303 645 , IEC 62443). For installers, system integrators and other administrators of HBES/BACS this document provides - a generic method for assessment of the security risk for each product in the perspective of the overall system. The result of the evaluation gives the minimum required security level on product level corresponding to the manufacturer classification above:


- (1) A guide to select products to comply with the required security level. - Best practice measures on the system security level.
- (2) A guide to enhance the maturity level of the cyber security management process.

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** Under develop-ment

■ Horizontals & Verticals

AIOTI Application-Centric Security, Privacy & Trust in IoT

 **URL:** https://aioti.eu/wp-content/uploads/2019/06/Webinar_Nr1_ApplicationCentric_SecurityPrivacyTrustInIoT_ArthursLegal_v2019.1_vPresented.pdf

ABSTRACT: This presentation focuses on “Security, Privacy & Trust in IoT Application-Centric Series” in: a) Personal Wearables (H2x); b) Moving Sensors (M2x); c) Long Term Fixed IoT Applications (M2x).

 **DOCUMENT TYPE:** Presentation

 **PUBLICATION DATE:** 2019-06

bioTope D3.3 V1.0 Context-Sensitive Security, Privacy Management, Adaptation Framework

 **URL:** <https://st11.ning.com/topology/rest/1.0/file/get/1065330?profile=original>

ABSTRACT: This document is part of the scope of building a Secure, Open & Standardised Systems of Systems Platform for IoT. It provides the technological foundation of the bioTope Systems of Systems (SoS) Platform for information source publication and consumption in the IoT, based on the O-MI

and O-DF standards. It includes new mechanisms to better manage 'Identities' and 'Context-sensitive Security and Privacy' (SaaS) of Connected Smart Objects and People to cope with the dynamic nature of the IoT.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2017-03

CENELEC EN 17529:2022 Cybersecurity and Data Protection

URL: https://standards.cencenelec.eu/dyn/www/f?p=CEN:110:0:::FSP_PROJECT,FSP_ORG_ID:63633,2307986&cs=11F702120AA40D5CC2DD42848140B1806

ABSTRACT: This document provides requirements for manufacturers and/or service providers to implement Data protection and Privacy by Design and by Default (DPbDD) early in their development of their products and services, i.e. before (or independently of) any specific application integration, to make sure that they are as privacy ready as possible. The document will be applicable to all business sectors, including the security industry.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2022-05

CENELEC prEN 17640 Fixed time cybersecurity evaluation methodology for ICT products

URL: https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT,FSP_LANG_ID:70971,25&cs=16CB6A9987F11452CBD61C83CAD57215B

ABSTRACT: This document describes a cybersecurity evaluation methodology that can be implemented using pre-defined time and workload resources, for ICT products. It is intended to be applicable for all three assurance levels defined in the CSA (i.e. basic, substantial and high).

The methodology comprises different evaluation blocks including assessment activities that comply with the evaluation requirements of the CSA for the mentioned three assurance levels.

Where appropriate, it can be applied both to 3rd party evaluation and self-assessment.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: Under develop-ment

CENELEC prEN XXXXX Security Evaluation Standard for IoT Platforms (SESIP)

URL: https://standards.cencenelec.eu/dyn/www/f?p=205:110:0:::FSP_PROJECT,FSP_LANG_ID:74909,25&cs=157BB6AD851BD6F80A208E00FBBD6B8DD

ABSTRACT: This document describes a cybersecurity evaluation methodology, named SESIP, for components of connected ICT products. Security claims in SESIP are made based on the security services offered by those components. Components can be in hardware and software. SESIP aims to support comparability between and reuse of independent security evaluations. SESIP provides a common set of requirements for the security functionality of components which apply to the foundational components of devices that are not application specific. The methodology describes the re-use of evaluation results.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: Under develop-ment

ECSO System security and certification considerations

 **URL:** <https://www.youtube.com/watch?v=mXiytFIOXeI>

ABSTRACT: Explore system's cyber security challenges, particularities and considerations inside the EU regulatory context, learn about the importance of defining a cyber security risk perimeter and gain insights on important security notions related to governance, maturity and diversity of processes, as well as people's competencies for design, build and commission. Last but not least, find out how to secure and operate a mission- specific system, and gain prospects on the existing relevant certification possibilities.

 **DOCUMENT TYPE:** Presentation

 **PUBLICATION DATE:** 2022-01

ENISA Baseline Security Recommendations for IoT

 **URL:** <https://www.enisa.europa.eu/publications/baseline-security-recommendations-for-iot>

ABSTRACT: The study which is titled 'Baseline Security Recommendations for Internet of Things in the context of critical information infrastructures', aims to set the scene for IoT security in Europe. It serves as a reference point in this field and as a foundation for relevant forthcoming initiatives and developments.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2017-11

ENISA IoT Security Standards Gap Analysis

 **URL:** <https://www.enisa.europa.eu/publications/iot-security-standards-gap-analysis>

ABSTRACT: This study analyses the gaps and provides guidelines for, in particular, the development or repositioning of standards, facilitating the adoption of standards and governance of EU standardisation in the area of NIS.

ENISA brings in this relationship its technical and organisational know-how in NIS which can be further leveraged into standards in terms of extending or assessing them to render them more appropriate to stakeholders and more compliant with the prevailing regulatory framework.

Special attention is given to the EU needs related to emerging cybersecurity certification schemes which will operate under the European cybersecurity certification framework. The framework is currently not adopted, but is expected to be finished at the end of this year. Standards or other widely adopted technical specifications containing requirements form the basis for any certification activity. European standards for security evaluation models, methods, techniques and tools adopted to the IoT world are urgently needed to complement existing initiatives, good practices and industry guidelines on IoT security.

 **DOCUMENT TYPE:** Gap analysis

 **PUBLICATION DATE:** 2019-01

ETSI DTS/MTS-TST10SecTest_IoTmodule Methods for Testing and Specification (MTS); Security Testing; IoT Security Functional Modules

 **URL:** https://portal.etsi.org/webapp/WorkProgram/Report_WorkItem.asp?WKI_ID=66187

ABSTRACT: Assemble security related functional modules within an IoT architecture, that support Security by Design and trustworthiness in order to retrieve relevant security testing methods and specific detailed test purposes using TDL-TO for generic IoT architectures applicable in multiple industrial domains.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: To be published in 2023-07

ETSI EN 303 645 CYBER; Cyber Security for Consumer Internet of Things: Baseline Requirements

URL: https://www.etsi.org/deliver/etsi_en/303600_303699/303645/02.01.01_60/en_303645v020101p.pdf

ABSTRACT: The present document specifies high-level security and data protection provisions for consumer IoT devices that are connected to network infrastructure (such as the Internet or home network) and their interactions with associated services. The associated services are out of scope. Moreover, the present document addresses security considerations specific to constrained devices. The present document provides basic guidance through examples and explanatory text for organizations involved in the development and manufacturing of consumer IoT on how to implement those provisions. Table B.1 provides a schema for the reader to give information about the implementation of the provisions. Devices that are not consumer IoT devices, for example those that are primarily intended to be used in manufacturing, healthcare or other industrial applications, are not in scope of the present document. The present document has been developed primarily to help protect consumers, however, other users of consumer IoT equally benefit from the implementation of the provisions set out here.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2020-06

ETSI TR 103 533 Security; Standards Landscape and best practices

URL: https://www.etsi.org/deliver/etsi_tr/103500_103599/103533/01.01.01_60/tr_103533v010101p.pdf

ABSTRACT: The document provides an overview of the Standards Landscape and best practices for the application of security technology to the IoT. The document complements the overview of the Standards Landscape and best practice for privacy to be found in ETSI TR 103 591.

DOCUMENT TYPE: Landscape

PUBLICATION DATE: 2019-08

ETSI TR 103 591 Privacy study report; Standards Landscape and best practices

URL: https://www.etsi.org/deliver/etsi_tr/103500_103599/103591/01.01.01_60/tr_103591v010101p.pdf

ABSTRACT: The purpose of the document is to demonstrate that in view of the increasingly growing number of connected objects anticipated in the near future, effective protection of privacy and data protection would require that the relevant decisions are made upfront, at the design stage of the IoT systems.

DOCUMENT TYPE: Landscape

PUBLICATION DATE: 2019-10

ETSI TS 103 646 Methods for Testing and Specification (MTS); Test Specification for foundational Security IoT-Profile

URL: https://www.etsi.org/deliver/etsi_ts/103600_103699/103646/01.01.01_60/ts_103646v010101p.pdf

ABSTRACT: The present document provides a test specification based on selected security requirements as known from IEC 6244-4-2. The chosen requirements have been collected by defining


a dedicated IoT profile. The resulting IoT profile represents a generic minimum security level for IoT devices. Advanced requirements for higher security demands have been excluded.

The present document serves as reference for a test campaign addressing the foundational security requirements of the IoT-Profile. The standardized notation TDL-TO has been applied for the definition of test purposes as it supports a unified presentation and semantics.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2021-01

ETSI TS 103 701 CYBER; Cyber Security for Consumer Internet of Things: Conformance Assessment of Baseline Requirements


 **URL:** https://www.etsi.org/deliver/etsi_ts/103700_103799/103701/01.01.01_60/ts_103701v010101p.pdf

ABSTRACT: The present document specifies a conformance assessment methodology for consumer IoT devices, their relation to associated services and corresponding relevant processes against ETSI TS 103 645 / ETSI EN 303 645, addressing the mandatory and recommended provisions as well as conditions and complements ETSI TS 103 645 / ETSI EN 303 645 by defining test cases and assessment criteria for each provision.


 DOCUMENT TYPE: Standard_Specification

 PUBLICATION DATE: 2021-08

ETSI TS 103 848 CYBER; Cyber Security for Home Gateways: Security Requirements as vertical from Consumer Internet of Things

 **URL:** https://www.etsi.org/deliver/etsi_ts/103800_103899/103848/01.01.01_60/ts_103848v010101p.pdf

ABSTRACT: The present document defines security provisions for Home Gateways resulting from the analysis presented in ETSI TR 103 743 [i.1], and extending from the provisions for consumer IoT devices defined in ETSI EN 303 645 [1].

 DOCUMENT TYPE: Standard_Specification

 PUBLICATION DATE: 2022-03

ETSI TR 103 621 Guide to Cyber Security for Consumer Internet of Things

 **URL:** [TR 103 621 - V1.1.1 - Guide to Cyber Security for Consumer Internet of Things \(etsi.org\)](https://www.etsi.org/deliver/etsi_tr/103621/103621_01.01.01_60/tr_103621v010101p.pdf)

ABSTRACT: The present document serves as guidance to help manufacturers and other stakeholders in meeting the cyber security provisions defined for Consumer IoT devices in ETSI EN 303 645 [i.1] and ETSI TS 103 645 [i.2]. The present document is complementary to ETSI EN 303 645 [i.1] and ETSI TS 103 701 [i.3]. It explains the relationship between these specifications and how they can be used together. It also provides a non-exhaustive set of example implementations that can be used to meet the provisions of ETSI EN 303 645 [i.1] and ETSI TS 103 645 [i.2], noting that not all possible implementations are included. Where relevant, pointers to supporting specifications are provided. Usage by industry players as well as future development of standards, such as specialisation into precise use cases, or certification aspects, are being given consideration.

 DOCUMENT TYPE: Technical Report

 PUBLICATION DATE: 2022-03

IEC IoT 2020: Smart and secure IoT platform

 **URL:** <https://www.iec.ch/basecamp/iot-2020-smart-and-secure-iot-platform>

ABSTRACT: The internet of things (IoT) is an infrastructure of interconnected objects, people or systems that processes and reacts to physical and virtual information. IoT collectively uses today's

internet backbone to connect things using sensors and other technologies. Through data collection and analysis it achieves a multitude of outcomes that generally aim to improve user experience or the performance of devices and systems. How data is collected and implemented will determine how transformational IoT can become. Security grows exponentially in importance as devices that were once isolated become interconnected and more and more information is collected. As with most disruptive technologies solutions are developed by a wide range of providers promoting their proprietary approaches which can also impact interconnectivity. Bringing the ambitious visions expressed by IoT to reality will require significant efforts in standardization. This white paper aims to provide an overview of today's IoT, including its limitations and deficiencies in the area of security, interoperability and scalability. It contains use cases that point to requirements for smart and secure IoT platforms. It also discusses next generation platform-level technologies and provides important recommendations to IoT stakeholders and for IoT standardization work. The white paper was prepared by the IEC Market Strategy Board (MSB) IoT 2020 project team with major contributions from SAP and the Fraunhofer Institute for Applied and Integrated Security AISEC.

📄 DOCUMENT TYPE: Whitepaper

📅 PUBLICATION DATE: 2016-10

IEC 62443-3-2:2020 Security for industrial automation and control systems - Part 3-2: Security risk assessment for system design

🔗 URL: <https://webstore.iec.ch/publication/30727>

ABSTRACT: IEC 62443-3-2:2020 establishes requirements for:

1. defining a system under consideration (SUC) for an industrial automation and control system (IACS);
2. partitioning the SUC into zones and conduits;
3. assessing risk for each zone and conduit;
4. establishing the target security level (SL-T) for each zone and conduit;
5. documenting the security requirements.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2020-06

IETF draft-ietf-lake-edhoc Ephemeral Diffie-Hellman Over COSE (EDHOC)

🔗 URL: <https://datatracker.ietf.org/doc/draft-ietf-lake-edhoc/>

ABSTRACT: This document specifies Ephemeral Diffie-Hellman Over COSE (EDHOC), a very compact and lightweight authenticated Diffie-Hellman key exchange with ephemeral keys.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2021-10

IETF draft-ietf-lake-traces Traces of EDHOC

🔗 URL: <https://datatracker.ietf.org/doc/draft-ietf-lake-traces/>

ABSTRACT: This document contains some example traces of Ephemeral Diffie-Hellman Over COSE (EDHOC).

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2021-11

[IETF draft-ietf-rats-ar4si Attestation Results for Secure Interactions](#)

 **URL:** <https://datatracker.ietf.org/doc/draft-ietf-rats-ar4si/>

ABSTRACT: This document defines reusable Attestation Result information elements. When these elements are offered to Relying Parties as Evidence, different aspects of Attester trustworthiness can be evaluated.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-03

[IETF draft-ietf-rats-architecture Remote Attestation Procedures Architecture](#)

 **URL:** <https://datatracker.ietf.org/doc/draft-ietf-rats-architecture/>

ABSTRACT: This document provides an architectural overview of the entities involved that make such tests possible through the process of generating, conveying, and evaluating evidentiary claims.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-02

[IETF draft-ietf-rats-daa Direct Anonymous Attestation for the Remote Attestation Procedures Architecture](#)

 **URL:** <https://datatracker.ietf.org/doc/draft-ietf-rats-daa/>

ABSTRACT: This document maps the concept of Direct Anonymous Attestation (DAA) to the Remote Attestation Procedures (RATS) Architecture. The role DAA Issuer is introduced and its interactions with existing RATS roles is specified.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2021-12

[IETF draft-ietf-rats-eat The Entity Attestation Token \(EAT\)](#)

 **URL:** <https://datatracker.ietf.org/doc/draft-ietf-rats-eat/>

ABSTRACT: This document extends CBOR Web Token (CWT) and JSON Web Token (JWT).


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-02

[IETF draft-ietf-rats-network-device-subscription Attestation Event Stream Subscription](#)

 **URL:** <https://datatracker.ietf.org/doc/draft-ietf-rats-network-device-subscription/>

ABSTRACT: This memo provides the methods and means to define additional Event Streams for other Conceptual Message as illustrated in the RATS Architecture, e.g. Attestation Results, Endorsements, or Event Logs.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-03

IoT draft-ietf-rats-reference-interaction-models Reference Interaction Models for Remote Attestation Procedures

 **URL:** <https://datatracker.ietf.org/doc/draft-ietf-rats-reference-interaction-models/>

ABSTRACT: This document describes interaction models for remote attestation procedures (RATS). Three conveying mechanisms:

- (1) Challenge/Response,
- (2) Uni-Directional, and
- (3) Streaming Remote Attestation are illustrated and defined.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-01

IoT draft-ietf-rats-uccs A CBOR Tag for Unprotected CWT Claims Sets

 **URL:** <https://datatracker.ietf.org/doc/draft-ietf-rats-uccs/>

ABSTRACT: This specification defines a CBOR tag for such unprotected CWT Claims Sets (UCCS) and discusses conditions for its proper use.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-01

IoT draft-ietf-teep-architecture Trusted Execution Environment Provisioning (TEEP) Architecture

 **URL:** <https://datatracker.ietf.org/doc/draft-ietf-teep-architecture/>

ABSTRACT: This architecture document motivates the design and standardization of a protocol for managing the lifecycle of trusted applications running inside such a Trusted Execution Environment (TEE).

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-02

IoT draft-ietf-teep-otrp-over-http HTTP Transport for Trusted Execution Environment Provisioning: Agent Initiated Communication

 **URL:** <https://datatracker.ietf.org/doc/draft-ietf-teep-otrp-over-http/>

ABSTRACT: This document specifies the HTTP transport for TEEP communication where a Trusted Application Manager (TAM) service is used to manage code and data in TEEs on devices that can initiate communication to the TAM.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-02

ietf draft-ietf-teep-protocol Trusted Execution Environment Provisioning (TEEP) Protocol

 **URL:** <https://datatracker.ietf.org/doc/draft-ietf-teep-protocol/>

ABSTRACT: This document specifies a protocol that installs, updates, and deletes Trusted Components in a device with a Trusted Execution Environment (TEE). This specification defines an interoperable protocol for managing the lifecycle of Trusted Components.


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2022-03

ietf RFC 8152 CBOR Object Signing and Encryption (COSE)

 **URL:** <https://datatracker.ietf.org/doc/rfc8152/>

ABSTRACT: This specification describes how to create and process signatures, message authentication codes, and encryption using CBOR for serialization. This specification additionally describes how to represent cryptographic keys using CBOR.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-01

ietf RFC 8387 Practical Considerations and Implementation Experiences in Securing Smart Object Networks

 **URL:** <https://datatracker.ietf.org/doc/rfc8387/>

ABSTRACT: This memo describes challenges associated with securing resource-constrained smart object devices


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2018-05

ietf RFC 8613 Object Security for Constrained RESTful Environments (OSCORE)

 **URL:** <https://datatracker.ietf.org/doc/rfc8613/>

ABSTRACT: This document defines Object Security for Constrained RESTful Environments (OSCORE), a method for application-layer protection of the Constrained Application Protocol (CoAP), using CBOR Object Signing and Encryption (COSE). OSCORE provides end-to-end protection between endpoints communicating using CoAP or CoAP-mappable HTTP. OSCORE is designed for constrained nodes and networks supporting a range of proxy operations, including translation between different transport protocols.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2019-07

IETF RFC 8812 CBOR Object Signing and Encryption (COSE) and JSON Object Signing and Encryption (JOSE) Registrations for Web Authentication (WebAuthn) Algorithms

 **URL:** <https://datatracker.ietf.org/doc/rfc8812/>

ABSTRACT: This specification registers the following algorithms (which are used by WebAuthn and CTAP implementations) in the IANA “COSE Algorithms” registry: RSASSA-PKCS1-v1_5 using SHA-256, SHA-384, SHA-512, and SHA-1; and Elliptic Curve Digital Signature Algorithm (ECDSA) using the secp256k1 curve and SHA-256. It registers the secp256k1 elliptic curve in the IANA “COSE Elliptic Curves” registry. Also, for use with JSON Object Signing and Encryption (JOSE), it registers the algorithm ECDSA using the secp256k1 curve and SHA-256 in the IANA “JSON Web Signature and Encryption Algorithms” registry and the Secp256k1 elliptic curve in the IANA “JSON Web Key Elliptic Curve” registry.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-08

IETF RFC 8995 Bootstrapping Remote Secure Key Infrastructure (BRSKI)

 **URL:** <https://datatracker.ietf.org/doc/rfc8995/>

ABSTRACT: This document specifies automated bootstrapping of an Autonomic Control Plane.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-05

IETF RFC7815 Minimal Internet Key Exchange Version 2 (IKEv2) Initiator Implementation

 **URL:** <https://datatracker.ietf.org/doc/rfc7815/>

ABSTRACT: This document describes a minimal initiator version of the Internet Key Exchange version 2 (IKEv2) protocol for constrained nodes.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2016-03

IRTF RFC 8576 Internet of Things (IoT) Security: State of the Art and Challenges

 **URL:** <https://datatracker.ietf.org/doc/rfc8576/>

ABSTRACT: In this document, This document first discuss the various stages in the lifecycle of a thing. Next, we document the security threats to a thing and the challenges that one might face to protect against these threats. Lastly, we discuss the next steps needed to facilitate the deployment of secure IoT systems.


 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2019-04

ISO ISO/DIS 31700 Consumer protection — Privacy by design for consumer goods and services

 **URL:** <https://www.iso.org/standard/76772.html>

ABSTRACT: This document establishes high-level requirements for privacy by design to protect privacy throughout the lifecycle of a consumer product, including domestic data processing by the consumer.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under develop-ment


ISO/IEC 15408:2009 Information technology — Security techniques — Evaluation criteria for IT security

 **URL:** <https://www.iso.org/standard/50341.html>

ABSTRACT: ISO/IEC 15408-1:2009 establishes the general concepts and principles of IT security evaluation and specifies the general model of evaluation given by various parts of ISO/IEC 15408 which in its entirety is meant to be used as the basis for evaluation of security properties of IT products. It provides an overview of all parts of ISO/IEC 15408. It describes the various parts of ISO/IEC 15408; defines the terms and abbreviations to be used in all parts ISO/IEC 15408; establishes the core concept of a Target of Evaluation (TOE); the evaluation context; and describes the audience to which the evaluation criteria are addressed. An introduction to the basic security concepts necessary for evaluation of IT products is given. It defines the various operations by which the functional and assurance components given in ISO/IEC 15408-2 and ISO/IEC 15408-3 may be tailored through the use of permitted operations. The key concepts of protection profiles (PP), packages of security requirements and the topic of conformance are specified and the consequences of evaluation and evaluation results are described.

ISO/IEC 15408-1:2009 gives guidelines for the specification of Security Targets (ST) and provides a description of the organization of components throughout the model.

General information about the evaluation methodology is given in ISO/IEC 18045 and the scope of evaluation schemes is provided.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2009-12

ISO/IEC 18045:2008 Information technology — Security techniques — Methodology for IT security evaluation


 **URL:** <https://www.iso.org/standard/46412.html>

ABSTRACT: ISO/IEC 18045:2008 is a companion document to ISO/IEC 15408, Information technology - Security techniques - Evaluation criteria for IT security. ISO/IEC 18045:2008 defines the minimum actions to be performed by an evaluator in order to conduct an ISO/IEC 15408 evaluation, using the criteria and evaluation evidence defined in ISO/IEC 15408. ISO/IEC 18045:2008 does not define evaluator actions for certain high assurance ISO/IEC 15408 components, where there is as yet no generally agreed guidance.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2008-08

ISO/IEC 27036-3:2013 Information technology — Security techniques — Information security for supplier relationships — Part 3: Guidelines for information and communication technology supply chain security

 **URL:** ISO - ISO/IEC 27036-3:2013 - Information technology — Security techniques — Information security for supplier relationships — Part 3: Guidelines for information and communication technology supply chain security

ABSTRACT: ISO/IEC 27036-3:2013 provides product and service acquirers and suppliers in the information and communication technology (ICT) supply chain with guidance on:

1. gaining visibility into and managing the information security risks caused by physically dispersed and multi-layered ICT supply chains;
2. responding to risks stemming from the global ICT supply chain to ICT products and services that can have an information security impact on the organizations using these products and services. These risks can be related to organizational as well as technical aspects (e.g. insertion of malicious code or presence of the counterfeit information technology (IT) products);
3. integrating information security processes and practices into the system and software lifecycle processes, described in ISO/IEC 15288 and ISO/IEC 12207, while supporting information security controls, described in ISO/IEC 27002.

ISO/IEC 27036-3:2013 does not include business continuity management/resiliency issues involved with the ICT supply chain. ISO/IEC 27031 addresses business continuity.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2013-11

ISO/IEC 27400 Cybersecurity - Security frameworks based on the conceptual model of cyber-physical systems

 **URL:** <https://standardsdevelopment.bsigroup.com/projects/9021-06476#/section>

ABSTRACT: This document provides the following: a) a conceptual model of cyber-physical systems (CPS) and its general features; b) security concerns, which serve as the basis for the discussion of security risks and security controls for the CPS based on the conceptual model, and several security frameworks to overcome those security concerns.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** Under develop-ment

ISO/IEC 27400:2022 Cybersecurity — IoT security and privacy — Guidelines

 **URL:** <https://www.iso.org/standard/44373.html>

ABSTRACT: This document provides guidelines on risks, principles and controls for security and privacy of Internet of Things (IoT) solutions.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2022-06

ISO/IEC 27404 Information technology — Security techniques — Universal cybersecurity labelling framework for consumer IoT

 **URL:** <https://www.iso27001security.com/html/27404.html>


ABSTRACT: This document defines a universal cybersecurity labelling framework for the development and implementation of cybersecurity labelling programmes for consumer IoT products and includes guidance on the following topics:

- (1) Risks and threats associated with consumer IoT products;
- (2) Stakeholders, roles and responsibilities;
- (3) Relevant standards and guidance documents;
- (4) Conformity assessment options;
- (5) Labelling issuance and maintenance requirements; and
- (6) Mutual recognition considerations.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under develop-ment

ISO/IEC 30149 ED1 Internet of Things (IoT) - Trustworthiness Principles

 **URL:** https://www.iec.ch/dyn/www/f?p=103:38:6519395980104:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:20486,23,104432

ABSTRACT: This document provides principles for IoT trustworthiness based on ISO/IEC 30141 – IoT Reference Architecture.


 **DOCUMENT TYPE:** Standard_Specification


 **PUBLICATION DATE:** Under develop-ment

ISO/IEC CD 27402.2 Cybersecurity — IoT security and privacy — Device baseline requirements

 **URL:** <https://www.iso.org/standard/80136.html>

ABSTRACT: This document will provide the minimum-security requirements for IoT Devices.


 **DOCUMENT TYPE:** Standard_Specification


 **PUBLICATION DATE:** Under develop-ment

ISO/IEC CD 27403.2 Cybersecurity – IoT security and privacy – Guidelines for IoT-domotics

 **URL:** <https://www.iso.org/standard/78702.html>

ABSTRACT: This proposal provides guidelines to analyse security and privacy risks and identifies controls that need to be implemented in IoT domotis systems.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under develop-ment

ISO/IEC DIS 24392 Cybersecurity — Security reference model for industrial Internet platform (SRM- IIP)

 **URL:** <https://www.iso.org/standard/78703.html>

ABSTRACT: This document presents specific characteristics of IIPs, including related security threats, context-specific security control objectives and security controls. This document covers specific security concerns in the industrial context and thus complements generic security standards and reference models. In particular, it includes secure data collection and transmission among industrial devices, data security of industrial cloud platform, and secure collaborations with various industry stakeholders. The audiences for this document are organizations who develop, operate, or use any components of IIPs, including third parties who provide services to the above stakeholders.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under develop-ment

ISO/IEC DIS 27071 Cybersecurity — Security recommendations for establishing trusted connections between devices and services

 **URL:** <https://www.iso.org/standard/56572.html>

ABSTRACT: This document provides a framework and recommendations for establishing trusted connections between devices and services based on hardware security modules, including recommendations for components such as: hardware security module, roots of trust, identity, authentication and key establishment, remote attestation, data integrity and authenticity. This document is applicable to establishing trusted connections between devices and services based on hardware security modules. This document does not address privacy concerns.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under develop-ment

ISO/IEC TS 19249:2017 Information technology — Security techniques — Catalogue of architectural and design principles for secure products, systems and applications


 **URL:** <https://www.iso.org/standard/64140.html>

ABSTRACT: ISO/IEC TS 19249:2017 provides a catalogue of architectural and design principles that can be used in the development of secure products, systems and applications together with guidance on how to use those principles effectively. This document gives guidelines for the development of secure products, systems and applications including a more effective assessment with respect to the security properties they are supposed to implement. Furthermore, this document does not establish any requirements for the evaluation or the assessment process or implementation.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-10

ISO/IEC TS 30168 Internet of Things (IoT) - Generic Trust Anchor Application Programming Interface for Industrial IoT Devices

 **URL:** https://www.iec.ch/ords/f?p=103:38:706375228480080:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:20486,20,104067

ABSTRACT: This document specifies a generic application programming interface (API) for the integration of secure elements within Industrial IoT (IIoT) devices. It considers needs from industrial

usage scenarios and applications. This document also provides guidance for implementation, testing, and conformity validation.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: Under develop-ment

NGI-0 Discovery NEUROPIL

🔗 URL: <https://gitlab.com/pi-lar/neuropil>

ABSTRACT: Neuropil is an open-source de-centralized messaging layer that focuses on security and privacy by design. Persons, machines, and applications first have to identify their respective partners and/or content before real information can be sent. The discovery is handled internally and is based on so called “intent messages” that are secured by cryptographic primitives. This project aims to create distributed search engine capabilities based on neuropil, that enable the discovery and sharing of information with significantly higher levels of trust and privacy and with more control over the search content for data owners than today’s standard.

📄 DOCUMENT TYPE: EU & National funded Open Source projects

📅 PUBLICATION DATE: Under develop-ment

oneM2M TR-0012-V2.0.0 End-to-End Security and Group Authentication

🔗 URL: https://onem2m.org/images/files/deliverables/Release2/TR-0012-End-to-End-Security_and_Group_Authentication_V2_0_0.pdf

ABSTRACT: The present document provides options and analyses for the security features and mechanisms providing end-to-end security and group authentication for oneM2M. The scope of this technical report includes use cases, threat analyses, high level architecture, generic requirements, available options, evaluation of options, and detailed procedures for executing end-to-end security and group authentication.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2016-8

oneM2M TR-0016-V-2.0.0 Study of Authorization Architecture for Supporting Heterogeneous Access Control Policies

🔗 URL: https://onem2m.org/images/files/deliverables/Release2/TR-0016-Authorization_Architecture_and_Access_Control_Policy-V2_0_0.pdf

ABSTRACT: This document provides technical solutions for oneM2M authorization architecture, authorization procedures and access control policies. Furthermore, this document also gives evaluations of these proposed technical solutions.

Note that the ETSI TS 118 103 only defines a high level authorization architecture that describes its major components and general authorization procedure. In particular, the objective of this document is to provide candidate security solutions related to authorization architecture, authorization procedures and access control policies. The present document provides security solutions in the following three aspects:

- a) Detailed design of authorization architecture: This part investigates the interfaces among authorization components (e.g. procedures and parameters), how these components could be distributed in different oneM2M entities (i.e. different CSEs), and how to implement Role Based Access Control (RBAC) and token based access control;
- b) Supporting user specified access control policies: This part investigates how the oneM2M authorization system could be an extensible system that can support user-defined access control mechanisms and/or access control policy languages;

c) Investigating existing access control policy languages: This part investigates if some standardized access control policy languages could become oneM2M recommended access control policy description languages.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2016-08

oneM2M TR-0062-V-0.3.0 oneM2M System Enhancement to Support Privacy Data Protection Regulations (eDPR)

🔗 URL: <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=33146>

ABSTRACT: The document is describing state of the art privacy related regulations and their features followed by gap analysis to find out what features are supported and not supported by the current oneM2M system. Based on the result of the technical report, it will identify possible enhancement features to support data protection regulations which the next oneM2M release(s) could support.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2020-11

oneM2M TR-0063-V-0.0.1 Effective IoT Communication to Protect 3GPP Networks

🔗 URL: <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=31370>

ABSTRACT: This work item describes how a oneM2M service layer hosted on a 3GPP Cellular IoT device can implement the requirements defined in GSMA TS.34 to ensure that a device does not operate in a manner that can impair the 3GPP Cellular network.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2019-11

oneM2M TS-0003-V4.6.0 Security Solutions

🔗 URL: <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34191>

ABSTRACT: This document defines security solutions for M2M systems.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2021-10

oneM2M WI-0095 System enhancements to support Data Protection Regulations

🔗 URL: <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=30968>

ABSTRACT: Proposes a work item to study oneM2M system enhancement to support data protection regulations such as General Data Protection Regulation from EU.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2019-10

oneM2M-TR-0041-V-0.4.0 oneM2M Decentralized Authentication


 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=26293>

ABSTRACT: This document describes the oneM2M Decentralized Authentication procedure.

 DOCUMENT TYPE: Technical_Report

 PUBLICATION DATE: 2018-03

oneM2M-TR-0050-V-0.13.0 Attribute Based Access Control Policy

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=32114>

ABSTRACT: This work item develops attribute based access control policy scheme and the corresponding access control policy management mechanism in oneM2M System.

 DOCUMENT TYPE: Technical_Report


 PUBLICATION DATE: 2020-05

■ Manufacturing

IEC 62443-2-4:2015 Security for industrial automation and control systems - Part 2-4: Security program requirements for IACS service providers

 **URL:** <https://webstore.iec.ch/publication/22810>

ABSTRACT: IEC 62443-2-4:2015 specifies requirements for security capabilities for IACS service providers that they can offer to the asset owner during integration and maintenance activities of an Automation Solution. The contents of the corrigendum of August 2015 have been included in this version.


 DOCUMENT TYPE: Standard_Specification

 PUBLICATION DATE: 2015-06

IEC 62443-3-2:2020 Security for industrial automation and control systems - Part 3-2: Security risk assessment for system design

 **URL:** <https://webstore.iec.ch/publication/30727>

ABSTRACT: IEC 62443-3-2:2020 establishes requirements for: a) defining a system under consideration (SUC) for an industrial automation and control system (IACS); b) partitioning the SUC into zones and conduits; c) assessing risk for each zone and conduit; d) establishing the target security level (SL-T) for each zone and conduit; and e) documenting the security requirements.

 DOCUMENT TYPE: Standard_Specification

 PUBLICATION DATE: 2020-06

IEC 62443-3-3:2013 Industrial communication networks - Network and system security - Part 3-3: System security requirements and security levels

 **URL:** <https://webstore.iec.ch/publication/7033>

ABSTRACT: IEC 62443-3-3:2013 provides detailed technical control system requirements (SRs) associated with the seven foundational requirements (FRs) described in IEC 62443-1-1 including defining the requirements for control system capability security levels, SL-C(control system). These requirements would be used by various members of the industrial automation and control system (IACS) community along with the defined zones and conduits for the system under consideration (SuC) while developing the appropriate control system target SL, SL-T (control system), for a specific asset. The contents of the corrigendum of April 2014 have been included in this copy.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2013-08-07

IEC 62443-4-2:2019 Security for industrial automation and control systems - Part 4-2: Technical security requirements for IACS components

 **URL:** <https://webstore.iec.ch/publication/34421>

ABSTRACT: IEC 62443-4-2:2019 provides detailed technical control system component requirements (CRs) associated with the seven foundational requirements (FRs) described in IEC TS 62443-1-1 including defining the requirements for control system capability security levels and their components, SL-C (component). As defined in IEC TS 62443-1-1 there are a total of seven foundational requirements (FRs):

- a) identification and authentication control (IAC),
- b) use control (UC),
- c) system integrity (SI),
- d) data confidentiality (DC),
- e) restricted data flow (RDF),
- f) timely response to events (TRE), and
- g) resource availability (RA).

These seven FRs are the foundation for defining control system security capability levels. Defining security capability levels for the control system component is the goal and objective of this document as opposed to SL-T or achieved SLs (SL-A), which are out of scope.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-01-15

IEC TR 62443-2-3:2015 Security for industrial automation and control systems - Part 2-3: Patch management in the IACS environment

 **URL:** <https://webstore.iec.ch/publication/22811>

ABSTRACT: IEC TR 62443-2-3:2015(E) describes requirements for asset owners and industrial automation and control system (IACS) product suppliers that have established and are now maintaining an IACS patch management program. This Technical Report recommends a defined format for the distribution of information about security patches from asset owners to IACS product suppliers, a definition of some of the activities associated with the development of the patch information by IACS product suppliers and deployment and installation of the patches by asset owners. The exchange format and activities are defined for use in security related patches; however, it may also be applicable for non-security related patches or updates.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2015-06-30

IEC TR 62443-3-1:2009 Industrial communication networks - Network and system security - Part 3-1: Security technologies for industrial automation and control systems

URL: <https://webstore.iec.ch/publication/7031>

ABSTRACT: IEC/TR 62443-3-1:2009(E) provides a current assessment of various cybersecurity tools, mitigation counter-measures, and technologies that may effectively apply to the modern electronically based IACSs regulating and monitoring numerous industries and critical infrastructures. It describes several categories of control system-centric cybersecurity technologies, the types of products available in those categories, the pros and cons of using those products in the automated IACS environments, relative to the expected threats and known cyber vulnerabilities, and, most important, the preliminary recommendations and guidance for using these cybersecurity technology products and/or countermeasures.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2009-07-30

IEC TR 62541-2:2020 OPC Unified Architecture - Part 2: Security Model

URL: <https://webstore.iec.ch/publication/61110>

ABSTRACT: IEC TR 62541-2:2020 which contains the International Standard and its Redline version, showing all changes of the technical content compared to the previous edition. IEC 62541-2:2020 describes the OPC Unified Architecture (OPC UA) security model. It describes the security threats of the physical, hardware, and software environments in which OPC UA is expected to run. It describes how OPC UA relies upon other standards for security. It provides definition of common security terms that are used in this and other parts of the OPC UA specification. It gives an overview of the security features that are specified in other parts of the OPC UA specification. It references services, mappings, and Profiles that are specified normatively in other parts of the OPC UA Specification. It provides suggestions or best practice guidelines on implementing security. Any seeming ambiguity between this part and one of the other normative parts does not remove or reduce the requirement specified in the other normative part.

DOCUMENT TYPE: Technical_Report


PUBLICATION DATE: 2020-11-17

■ Mobility

ETSI TS 102 731 ITS; Security; Security Services and Architecture


 **URL:** http://www.etsi.org/deliver/etsi_ts/102700_102799/102731/01.01.01_60/ts_102731v010101p.pdf

ABSTRACT: The document specifies mechanisms and protocols for secure and privacy-preserving communication in vehicular environments, including vehicle-to-vehicle and vehicle-to infrastructure communication. It will provide credential and identity management, privacy and anonymity, integrity protection, authentication and authorization. It will incorporate mechanisms such as addressing schemes building on pseudonymization concepts, the protocols for address update, and for exchanging, updating, and invalidating credentials to counterfeit attacks on security and reliability of communication. Further methods to prevent malicious tracking of identity and location will be provided.

 **DOCUMENT TYPE:** Standard_Specification


 **PUBLICATION DATE:** 2010-09

ETSI TS 102 940 ITS; Security; ITS communications security architecture and security management

 **URL:** http://www.etsi.org/deliver/etsi_ts/102900_102999/102940/01.03.01_60/ts_102940v010301p.pdf

ABSTRACT: The present document specifies a security architecture for Intelligent Transport System (ITS) communications. Based upon the security services defined in ETSI TS 102 731, it identifies the functional entities required to support security in an ITS environment and the relationships that exist between the entities themselves and the elements of the ITS reference architecture defined in EN 302 665. The present document also identifies the roles and locations of a range of security services for the protection of transmitted information and the management of essential security parameters. These include identifier and certificate management, PKI processes and interfaces as well as basic policies and guidelines for trust establishment.

It has been published for both Release 1 (V1.3.1) and Release 2 (V2.1.1) of the ETSI C-ITS standards

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-04

IEEE 1609.2 standard for Security, Network Services and Multi-Channel Operation: Security Services for Applications and Management Messages

 **URL:** <https://ieeexplore.ieee.org/document/7426684>

ABSTRACT: Communications/Networking - DSRC is a U.S. Department of Transportation (DOT) project based on ISO's Communications Access for Land Mobiles (CALM) architecture for vehicle-based communication networks, particularly for applications such as toll collection, vehicle safety services, and commerce transactions via cars. This specification focuses on Security Services for Applications and Management Messages.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-03

IEEE 1609.3 standard for Security, Network Services and Multi-Channel Operation: Networking Services

 **URL:** <https://ieeexplore.ieee.org/document/7458115>

ABSTRACT: Communications/Networking - DSRC is a U.S. Department of Transportation (DOT) project based on ISO's Communications Access for Land Mobiles (CALM) architecture for vehicle-based communication networks, particularly for applications such as toll collection, vehicle safety services, and commerce transactions via cars. This specification focuses on Networking Services.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-04

IEEE 1609.4 standard for Security, Network Services and Multi-Channel Operation: Multi-Channel Operations

 **URL:** <https://ieeexplore.ieee.org/document/7435228>

ABSTRACT: Communications/Networking - DSRC is a U.S. Department of Transportation (DOT) project based on ISO's Communications Access for Land Mobiles (CALM) architecture for vehicle-based communication networks, particularly for applications such as toll collection, vehicle safety services, and commerce transactions via cars. This specification focuses on Multi-Channel Operations.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2016-03

SAE ARINC687 Onboard secure Wi-Fi Network Profile Standard

 **URL:** <https://www.sae.org/standards/content/arinc687/>

ABSTRACT: This document defines a standard implementation for strong client authentication and encryption of Wi-Fi-based client connections to onboard Wireless LAN (WLAN) networks. WLAN networks may consist of multi-purpose inflight entertainment system networks operating in the Passenger Information and Entertainment System (PIES) domain, dedicated aircraft cabin wireless networks or localized Aircraft Integrated Data (AID) devices operating in the Aircraft Information Services (AIS) domain. The purpose of this document is to focus on the client devices requiring connections to these networks such as electronic flight bags, flight attendant mobile devices, onboard Internet of Things (IoT) devices, AID devices (acting as clients) and mobile maintenance devices. Passenger devices are not within the focus of this document.


 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-06

SAE J2931/7 Security for Plug-In Electric Vehicle Communications

 **URL:** https://www.sae.org/standards/content/j2931/7_201802/

ABSTRACT: This SAE Information Report J2931/7 establishes the security requirements for digital communication between Plug-In Electric Vehicles (PEV), the Electric Vehicle Supply Equipment (EVSE) and the utility, ESI, Advanced Metering Infrastructure (AMI) and/or Home Area Network (HAN).

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2018-02

■ Safety and Emergencies

■ Horizontals & Verticals

ASTM F3463-21 Standard Guide for Ensuring the Safety of Connected Consumer Products

 **URL:** <https://www.astm.org/f3463-21.html>

ABSTRACT: This guide provides guidance for connected consumer products, as it relates to physical product safety hazards created by virtue of their connectivity. It applies to connected products that need testing and evaluation to prevent cybersecurity vulnerabilities and weaknesses that could compromise the safety-related performance of the product, create a physical safety hazard in the product or its operation, or result in a noncompliance to the underlying end product safety standard.

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** 2021-10

bioTope D6.5 V1.0 Proof-of-Concept «Brussels-Capital Region Pilot» Implementation


 **URL:** <https://storage.ning.com/topology/rest/1.0/file/get/35619888?profile=original>

ABSTRACT: This report presents 3 pilots: Safety Around Schools, Waterbus, and Smart Parking for Disabled People. A focus is made on the integration of the bioTope building blocks, mainly in the 'Safety Around School' use case. In particular, it includes the implementation of the IoT gateway based on the O-MI and O-DF standards that enables to publish data coming from heterogeneous systems and its registration on the bioTope marketplace (referred to as IoTbN) for discovery purposes.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2018-02

ETSI TR 103 582 EMTEL; Study of use cases and communications involving IoT devices in provision of emergency situations

 **URL:** https://www.etsi.org/deliver/etsi_tr/103500_103599/103582/01.01.01_60/tr_103582v010101p.pdf

ABSTRACT: The present document considers communications involving IoT devices in all types of emergency situations. This includes the use of IoT devices to enhance:

- (1) Emergency calling, e.g. between individuals and emergency authorities/organizations, between emergency authorities/organizations, and between individuals.
- (2) Mission critical communications within emergency services/public safety organizations, e.g. between public safety officers and control centres, between the control centres of different public safety organizations, and between individual public safety officers.
- (3) Public Warning System type communications from authorities to the general public.
- (4) Automated emergency response (new IoT domain) between two IoT devices.

The current state of the art for IoT device communications, especially when relevant to emergency situations, is described and use cases illustrate how such communications can be used to provide additional/enhanced information for communicating parties involved in emergency situations.

The impact of the use cases on the existing emergency, public warning, and mission critical communications is then considered, and recommendations for requirements to existing specifications for each domain are provided.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2019-07

ITU X.1303 bis Secure applications and services – Emergency communications: Common Alerting Protocol Version 1.2

🔗 URL: <https://www.itu.int/en/ITU-D/Emergency-Telecommunications/Documents/2020/T-REC-X.1303bis-201403-.pdf>

ABSTRACT: The Common Alerting Protocol (CAP) is a simple but general format for exchanging all-hazard emergency alerts and public warnings over all kinds of networks. CAP allows a consistent warning message to be disseminated simultaneously over many different warning systems, thus increasing warning effectiveness while simplifying the warning task. CAP also facilitates the detection of emerging patterns in local warnings of various kinds, such as might indicate an undetected hazard or hostile act. And CAP provides a template for effective warning messages based on best practices identified in academic research and real-world experience.

📄 DOCUMENT TYPE: Recommended Practice

📅 PUBLICATION DATE: 2014-03

ITU-T Y.4116 Requirements of transportation safety services including use cases and service scenarios

🔗 URL: <https://handle.itu.int/11.1002/1000/13385>

ABSTRACT: This Recommendation addresses requirements for providing transportation safety services based on Internet of things (IoT) technologies. These requirements are applicable to various means of transportation, e.g., road, railway, maritime and air.

In this Recommendation, the concepts of transportation safety management according to the processing phases of IoT sensing data and the IoT sensing data necessary for safety management are introduced. An example of a decision-making hierarchy for transportation safety is also described.

The requirements for transportation safety services are described and classified according to the ITU T IoT reference model [ITU-T Y.4000].

Use cases and related service scenarios used to extract requirements for the various transportation safety services are described in Appendix I. Appendix II shows the relationship between the requirements provided in clause 7 and the use cases described in Appendix I.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2017-10

OASIS CAP-v1.2 Common Alerting Protocol Version 1.2

🔗 URL: <http://docs.oasis-open.org/emergency/cap/v1.2/CAP-v1.2.html>

ABSTRACT: The Common Alerting Protocol (CAP) is a simple but general format for exchanging all-hazard emergency alerts and public warnings over all kinds of networks. CAP allows a consistent warning message to be disseminated simultaneously over many different warning systems, thus increasing warning effectiveness while simplifying the warning task. CAP also facilitates the detection of emerging patterns in local warnings of various kinds, such as might indicate an undetected hazard or hostile act. And CAP provides a template for effective warning messages based on best practices identified in academic research and real-world experience.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2010-07

oneM2M TS-0037-V-0.9.0 IoT Public Warning Service Enablement

URL: <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=32830>

ABSTRACT: This technical specification specifies the information model of the public warning service, and defines the resource mapping rule for the information model of the public warning.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2020-10

■ Manufacturing

IEC EC 63237-1 ED1 Household and similar electrical appliances - Product information properties - Part 1: Fundamentals

URL: https://www.iec.ch/dyn/www/f?p=103:38:1645358955729:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:1275,23,102429

ABSTRACT: This part of IEC 63237 provides a method of standardizing the descriptions of household electrical appliances. The aims of this standard are: a) to define a common language for customers and suppliers through the publication of classes, represented by properties and their attributes; b) enable electronic data exchange by machines (including information technology systems, see M2M communication); c) to optimize workflows between customers and suppliers as well as in processes such as engineering, development and purchasing within their own organizations; d) to offer also a dictionary to legislators and; e) to reduce transaction costs.


The standard describes household electrical appliances using properties and makes the associated properties available in the IEC Common Data Dictionary (IEC CDD). Furthermore, this document provides rules, methods and the generic data structure for product specific classification standards and on how to produce a reference dictionary based on IEC 61360 Series. This in turn creates a descriptive basis of company internal and external descriptions of household electrical appliances based on structured classes and lists of properties.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: Under development

■ Mobility


ETSI TS 103 300-3 ITS; Vulnerable Road Users (VRU) awareness; Part 3: Specification of VRU awareness basic service; Release 2

 **URL:** http://www.etsi.org/deliver/etsi_ts/103300_103399/10330003/02.01.02_60/ts_10330003v020102p.pdf

ABSTRACT: Cooperative awareness within road traffic means that road users and roadside infrastructure are informed about each other's position, dynamics and attributes. Road users are all kind of road vehicles like cars, trucks, motorcycles, bicycles or even pedestrians and roadside infrastructure equipment including road signs, traffic lights or barriers and gates. The awareness of each other is achieved by regular exchange of information among vehicles, pedestrians and roadside infrastructure based on wireless networks. An integral part of road ITS are the class of vulnerable road users (VRU) including pedestrians, bicyclists, motorcyclists and animals. In order to efficiently participate in the road safety related ITS communication a continuous repeated awareness message is transmitted by these VRUs using the VRU Awareness Message (VAM).

The construction, management and processing of VAMs is done by the VRU basic service, which is part of the facilities layer within the ITS communication architecture defined in ETSI EN 302 665.

This document is the third and last part of the ETSI TS 103 300 standard for VRU awareness.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-04

ITU-T Y.4457 (06/2018) Architectural framework for transportation safety service

 **URL:** <https://handle.itu.int/11.1002/1000/13641>

ABSTRACT: This recommendation addresses a transportation safety management model that describes disaster management steps based on Internet of things (IoT) technologies in order to reduce damage from disasters. An architectural model for transportation safety services is described based on [ITU T Y.4116] and on requirements according to the IoT reference model [ITU T Y.4000]. The scope and characteristics of transportation disasters from various transportations (e.g., road, railway, maritime and air transportation) are based on [ITU-T Y.4116]. Transportation safety management parameters (e.g., safety index and driver tiredness) are presented respectively in Annex A and Annex B and sensing data pre-processing procedure and characteristics of transportation application services are described in the appendices of this Recommendation.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2018-06


■ Smart City

■ Horizontals & Verticals

ISO/IEC 30146:2019 Information technology - Smart city ICT indicators

 **URL:** <https://www.iso.org/standard/70302.html>

ABSTRACT: This document defines a comprehensive set of evaluation indicators specially related to information and communication technologies (ICT) adoption and usage in smart cities. Firstly, this document establishes an overall framework for all the indicators. Then, this document specifies the name, description, classification and measure method for each indicator.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2019-10

ISO/IEC 30182:2017 Smart city concept model — Guidance for establishing a model for data interoperability

 **URL:** <https://www.iso.org/standard/53302.html>

ABSTRACT: ISO/IEC 30182:2017 describes, and gives guidance on, a smart city concept model (SCCM) that can provide the basis of interoperability between component systems of a smart city, by aligning the ontologies in use across different sectors. It includes: (1) concepts (e.g. ORGANIZATION, PLACE, COMMUNITY, ITEM, METRIC, SERVICE, RESOURCE); and (2) relationships between concepts (e.g. ORGANIZATION has RESOURCES, EVENT at a PLACE).


The SCCM does not replace existing models where they exist, but, by mapping from a local model to a parent model, questions can be asked about data in a new and joined-up way.

ISO/IEC 30182:2017 is aimed at organizations that provide services to communities in cities, and manage the resulting data, as well as decision-makers and policy developers in cities.1)

The SCCM is relevant wherever many organizations provide services to many communities within a place. It does not cover the data standards that are relevant to each concept in the SCCM and does not attempt to list or recommend the sources of identifiers and categorizations that cities map to the SCCM.

The SCCM has been devised to communicate the meaning of data. It does not attempt to provide concepts to describe the metadata of a dataset, for example, validity and provenance of data.

It covers semantic interoperability, that is, defining the meaning of data, particularly from many sources. It does not cover other barriers to interoperability, some of which are described at 3.2.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2017-05

oneM2M-TR-0061 -V-0.3.0 Study on ontologies for Smart City Services

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34704>

ABSTRACT: This document describes a study on ontologies for Smart City Services.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2021-08


■ Social Community and Wellbeing

■ Energy

ITU-T L.1383 (10/2021) Smart energy for cities and home applications

 **URL:** <https://handle.itu.int/11.1002/1000/14719>


ABSTRACT: This recommendation will focus on smart energy solutions in different applications for saving energy and reducing carbon emissions. With the development of ICT technology, smart energy solutions are not only used for ICT systems, but also in homes, remote islands, businesses, industries, and countries. The following aspects will be taken into consideration in this Recommendation: (1) Different energy input solutions, (2) Electric characteristic, (3) Safety performances, (4) Environmental impacts, (5) Reliability, (6) Any other items.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-10

■ Health

ETSI SR 003 809 eHEALTH; The role of ICT to enable Health crisis management and recovery; Responding to the 2019 SARS-CoV-2 Pandemic

 **URL:** https://www.etsi.org/deliver/etsi_sr/003800_003899/003809/01.01.02_60/sr_003809v010102p.pdf

ABSTRACT: This report contains a detailed review of actions to be taken by ETSI, in partnership with other SDOs and industrial development groups, in driving ICT standards to support societal responses to health crisis. It considers the role played by ICT in response to the SARS-CoV-19 pandemic and identifies where there were successes, where there were failures, and where ICT and particularly standards in ICT, may play a role in future mitigations.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2021-12

ITU-T H.842 (11/2019) Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 2: Optimized Exchange Protocol: Personal Health Gateway

 **URL:** <https://handle.itu.int/11.1002/1000/14116>

ABSTRACT: This recommendation provides a test suite structure (TSS) and the test purposes (TPs) for personal health gateways (PHGs) using the IEEE 11073-20601 optimized exchange protocol in the Personal Health Devices (PHD) interface, based on the requirements defined in the Recommendations of the ITU-T H.810 sub-series, of which Recommendation ITU-T H.810 (2017) is

the base Recommendation. The objective of this test specification is to provide a high probability of interoperability at this interface.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2019-11

ITU-T H.844 (11/2019) Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 4: Continua Design Guidelines: Personal Health Gateway

🔗 URL: <https://handle.itu.int/11.1002/1000/14117>

ABSTRACT: This recommendation provides a test suite structure (TSS) and the test purposes (TP) for Personal Health Gateways (PHGs) in the Personal Health Devices (PHD) interface, based on the requirements defined in the Recommendations of the ITU-T H.810 sub-series, of which Recommendation ITU-T H.810 (2017) is the base Recommendation. The objective of this test specification is to provide a high probability of interoperability at this interface.

📄 DOCUMENT TYPE: Standard_Specification

📅 PUBLICATION DATE: 2019-11

■ Horizontals & Verticals

ISO/IEC TR 30174:2021 Internet of Things (IoT) - Socialized IoT system resembling human social interaction dynamics

🔗 URL: <https://webstore.iec.ch/publication/66419>

ABSTRACT: ISO/IEC TR 30174:2021(E) describes: a) key features of the socialized IoT systems, e.g. sensing the external physical world, resolving the uncertainties of targets, satisfying users' demand and providing quality service, etc.; b) socialized attributes, i.e. socialized network, socialized collaboration, and socialized services, which are derived from the key features; and c) guidelines on how to use or apply the socialized attributes in the design and development of IoT systems.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2021-11

bioTope D6.4 V1.0 Proof-of-Concept “Greater Lyon Pilot” Implementation

🔗 URL: <https://storage.ning.com/topology/rest/1.0/file/get/35619978?profile=original>

ABSTRACT: This document presents two pilot use cases deployed in Lyon: bottle banks management and heat wave mitigation. It presents how the use cases meet the smart metropolis strategy, the expectations of the different stakeholders, and which services are provided. Hardware and software solutions contributing to the services are then described. A focus is made on the integration of the heat wave mitigation use case in the bioTope ecosystem including the description of the gateways built between heterogeneous systems and the O-DF/O-MI standard, the semantic annotations added to data and the publication on the bioTope marketplace. Concerning the bottle banks use case, the document shows how the interoperability enabled by the bioTope ecosystem makes it possible to develop new collaborative services with several partners and the metropolis.

📄 DOCUMENT TYPE: Technical_Report

📅 PUBLICATION DATE: 2018-01

■ Strategies Policies and Planning

■ Buildings

[ETSI TS 103 735 SmartM2M; Smart Lifts IoT System](#)

🔗 **URL:** http://www.etsi.org/deliver/etsi_ts/103700_103799/103735/01.01.02_60/ts_103735v010102p.pdf

ABSTRACT: Standardize the IoT system for Smart Lifts. It includes : a) the identification of the relevant roles; b) the Information models in the Smart Lift system, including signals, alarms and commands; c) the mapping to Semantic model of oneM2M (SDT) and ETSI SAREF; d) the communication system.

📄 **DOCUMENT TYPE:** Standard_Specification

📅 **PUBLICATION DATE:** 2021-07

■ Horizontals & Verticals

[CEN/CENELEC CWA 17431 Principles and guidance for licensing Standard Essential Patents in 5G and the Internet of Things \(IoT\), including the Industrial Internet](#)

🔗 **URL:** <https://www.cencenelec.eu/media/CEN-CENELEC/CWAs/ICT/cwa17431.pdf>

ABSTRACT: This CEN Workshop Agreement (CWA) addresses a broad set of Principles and Guidance to form a solid foundation for future practice with regard to SEP licensing for ICT standards such as mobile communication standards and other wireless communication standards. The CWA also includes information about licensing to those who are new to the implementation and use of standardised technology and the licensing of patents that cover those technologies.

📄 **DOCUMENT TYPE:** Guideline

📅 **PUBLICATION DATE:** 2019-06

[ETSI TR 103 536 Strategic/technical approach on how to achieve interoperability/interworking of existing standardized IoT Platforms](#)


🔗 **URL:** https://www.etsi.org/deliver/etsi_tr/103500_103599/103536/01.01.02_60/tr_103536v010102p.pdf

ABSTRACT: The document outlines the nature, the role of IoT platforms and proposes elements for the identification of the most relevant ones. It also addresses detailed examples such as Industrial IoT to outline the challenges posed to generic IoT platforms. It addresses the issues related to the interoperability and interworking of IoT platforms, in particular standardized IoT platforms, and how the way they are handled can foster their adoption by the IoT community.

📄 **DOCUMENT TYPE:** Technical_Report

📅 **PUBLICATION DATE:** 2019-12

ISO/IEC PWI JTC1-SC41-8 Internet of Things (IoT) - Behavioral and policy interoperability

 **URL:** https://www.iec.ch/ords/f?p=103:38:204774363295796:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:20486,23,108353

ABSTRACT: Based on ISO/IEC 21823-1, this document provides the basic concepts for IoT systems and digital twin systems behavioral and policy interoperability. This includes: (1) requirements, (2) guidance on how to identify points of interoperability, (3) guidance on how to express behavioral and policy information on capabilities, (4) guidance on how to achieve trustworthiness interoperability, and (5) use cases and examples.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under develop-ment

oneM2M TS-0002-V4.6.0 Requirements

 **URL:** <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=29274>

ABSTRACT: The present document contains an informative functional role model and normative technical requirements for oneM2M.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2019-11

■ Mobility

SAE ARINC686 Roadmap for IPv6 Transition in Aviation

 **URL:** <https://www.sae.org/standards/content/arinc686/>

ABSTRACT: This report represents the consensus of industry to prepare a roadmap migration from IPv4 to IPv6. This document describes airline objectives (air and ground side when possible) towards the development and introduction of IPv6. There are three distinct elements considered: 1) the applications for addressing aspects 2) the communication network(s) over which the applications are running for the IP protocol level itself and associated features, and 3) the physical link(s) the network(s) interface.

 **DOCUMENT TYPE:** Guideline

 **PUBLICATION DATE:** 2020-06


■ Sustainability and Resilience

■ Buildings

ITU-T L.1371 (06/2020) A methodology for improving, assessing and scoring the sustainability performance of office buildings

 **URL:** <https://handle.itu.int/11.1002/1000/14304>

ABSTRACT: This recommendation provides a consistent framework for owners, managers and building operators to critically assess ten (10) key areas of environmental performance and management of office buildings; (1) Energy, (2) Water, (3) Air, (4) Comfort, (5) Health & Wellness, (6) Purchasing, (7) Custodial, (8) Waste, (9) Site, and (10) Stakeholders.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2020-06

■ Energy

CENELEC prEN IEC 63345 Energy Efficiency Systems - Simple External Consumer Display

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=305:110:0:::FSP_PROJECT,FSP_LANG_ID:74332,25&cs=10C4D76ADB0C4C7D5B9DA81FF8E547C2D

ABSTRACT: This Standard specifies a data model to abstract the metering world towards a simple external consumer display. The data model, as described by means of functional blocks contained in this IEC Standard, lays down the format of metering data accessible by a simple external consumer display. This data interface would be typically part of the meter communication functions and be accessed by a simple external consumer display via the H1 interface of the CEN/CLC/ETSI TR 50572 between the display and the meter communication functions.


 **DOCUMENT TYPE:** Standard_Specification


 **PUBLICATION DATE:** Under develop-ment

CENELEC prEN IEC 63402 Energy Efficiency Systems - Smart Grid - Customer Energy Management Systems - General Requirements and Architecture

 **URL:** https://standards.cencenelec.eu/dyn/www/f?p=305:110:0:::FSP_PROJECT,FSP_LANG_ID:74575,25&cs=167DD57F4AA099C41201ADC1979E157B2


ABSTRACT: This Standard specifies General Requirements and Architecture of an application layer interface between the Customer Energy Manager (CEM) and Smart Devices (SD) operating within the smart grid premises-side system (i.e. home or building but not industrial premises).

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** Under develop-ment

■ Horizontals & Verticals

ITU Standards Landscape - IoT & Smart Sustainable Cities

 **URL:** <https://www.itu.int/net4/itu-t/landscape/#?topic=0.78&workgroup=1&searchValue=&page=1&sort=Relevance>

ABSTRACT: This document presents the Standards Landscape - IoT & Smart Sustainable Cities


 **DOCUMENT TYPE:** Landscape

 **PUBLICATION DATE:** N/A

■ Terms and Definitions

■ Horizontals & Verticals

ETSI SR 003 680 SmartM2M; Guidelines for Security, Privacy and Interoperability in IoT System Definition; A Concrete Approach

 **URL:** http://www.etsi.org/deliver/etsi_sr/003600_003699/003680/01.01.01_60/sr_003680v010101p.pdf

ABSTRACT: Providing guidelines for Security, Privacy and Interoperability in IoT System Definition based on the analysis of representative use cases.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2020-03

IETF RFC 7228 Terminology for Constrained-Node Networks

 **URL:** <https://datatracker.ietf.org/doc/rfc7228/>

ABSTRACT: This document provides a number of basic terms that have been useful in the standardization work for constrained-node networks.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2014-05

IETF RFC7102 Terms Used in Routing for Low-Power and Lossy Networks

 **URL:** <https://datatracker.ietf.org/doc/rfc7102/>

ABSTRACT: This document provides a glossary of terminology used in routing requirements and solutions for networks referred to as Low-Power and Lossy Networks (LLNs). An LLN is typically composed of many embedded devices with limited power, memory, and processing resources interconnected by a variety of links. There is a wide scope of application areas for LLNs, including industrial monitoring, building automation (e.g., heating, ventilation, air conditioning, lighting, access control, fire), connected home, health care, environmental monitoring, urban sensor networks, energy management, assets tracking, and refrigeration.

 **DOCUMENT TYPE:** Technical_Report

 **PUBLICATION DATE:** 2014-01

IRTF draft-irtf-t2trg-secure-bootstrapping Terminology and processes for initial security setup of IoT devices

 **URL:** <https://datatracker.ietf.org/doc/draft-irtf-t2trg-secure-bootstrapping/>

ABSTRACT: This document provides an overview of terms that are commonly used when discussing the initial security setup of Internet of Things (IoT) devices. This document also presents a brief but illustrative survey of protocols and standards available for initial security setup of IoT devices.

DOCUMENT TYPE: Technical_Report

PUBLICATION DATE: 2021-10

ISO/IEC 20924:2021 Internet of Things (IoT) - Vocabulary

URL: <https://webstore.iec.ch/publication/66217>

ABSTRACT: ISO/IEC 20924:2021 is available as ISO/IEC 20924:2021 RLV which contains the International Standard and its Redline version, showing all changes of the technical content compared to the previous edition. ISO/IEC 20924:2021 (E) provides a definition of Internet of Things along with a set of terms and definitions. This document is a terminology foundation for the Internet of Things.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2021-03

ISO/IEC PWI JTC1-SC41-6 Guidance for IoT and Digital Twin use cases

URL: https://www.iec.ch/dyn/www/f?p=103:38:204774363295796:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:20486,23,104897

ABSTRACT: The scope of this document is to: a) define a conceptual model for the building of use cases; b) specify a use case template ontology, i.e. vocabulary as well as conventions for describing and representing use case contents; c) provide guidance on building use case templates and on extending a use case ontology to cover the targeted standard; d) provide examples of use case templates and use cases; and e) specify an implementation scheme that will allow use cases to be stored and shared in a repository.

DOCUMENT TYPE: Guideline

PUBLICATION DATE: Under develop-ment

ITU-T Y.4000/Y.2060 (06/2012) Overview of Internet of Things

URL: <https://handle.itu.int/11.1002/1000/11559>

ABSTRACT: This recommendation provides an overview of the Internet of things (IoT). It clarifies the concept and scope of the IoT, identifies the fundamental characteristics and high-level requirements of the IoT and describes the IoT reference model. The ecosystem and business models are also provided in an informative appendix.

DOCUMENT TYPE: Standard_Specification

PUBLICATION DATE: 2012-06

oneM2M TS-0011-V4.1.0 Common Terminology

URL: <https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=31396>

ABSTRACT: This TS contains a collection of specific technical terms (definitions and abbreviations) used within oneM2M .

DOCUMENT TYPE: Technical_Report


PUBLICATION DATE: 2019-12

■ Manufacturing

ISO/IEC 20924:2021 RLV Redline version Internet of Things (IoT) - Vocabulary

 **URL:** <https://webstore.iec.ch/publication/68737>

ABSTRACT: ISO/IEC 20924:2021 RLV contains both the official IEC International Standard and its Redline version. The Redline version is available in English only and provides you with a quick and easy way to compare all the changes between the official IEC Standard and its previous edition. ISO/IEC 20924:2021 (E) provides a definition of Internet of Things along with a set of terms and definitions. This document is a terminology foundation for the Internet of Things.

 **DOCUMENT TYPE:** Standard_Specification

 **PUBLICATION DATE:** 2021-03

■ Mobility

SAE ARINC688 Intersystem Network Integration

 **URL:** <https://www.sae.org/standards/content/arinc688/>

ABSTRACT: The purpose of this document is to provide guidelines for integrating previously standalone cabin systems such as cabin management systems, In-Flight Entertainment (IFE) systems, In-Flight Connectivity (IFC) systems, galley systems, surveillance systems, etc.

Resource sharing between systems can reduce airline costs and/or increase functionality. But, as systems expose their internal resources to external systems, the risk of an intrusion that could degrade function and/or negatively expose the supplier's or airline's brand increases. This document provides a recommended IP networking design framework between aircraft systems to reduce the operational security threats while still supporting the necessary intersystem routing.

Title	Date	Weblink
3GPP TR 36.763 V17.0.0 Study on Narrow-Band Internet of Things (NB-IoT) / enhanced Machine Type Communication (eMTC) support for Non-Terrestrial Networks (NTN)	2021-06	https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3747
3GPP TR 36.763 V17.0.0 Study on Narrow-Band Internet of Things (NB-IoT) / enhanced Machine Type Communication (eMTC) support for Non-Terrestrial Networks (NTN)	2021-06	https://www.3gpp.org/news-events/1805-iot_r14
3GPP TR 36.802 V13.0.0 Evolved Universal Terrestrial Radio Access (E-UTRA); NB-IOT; Technical Report for BS and UE radio transmission and reception	2016-06	https://www.3gpp.org/news-events/3gpp-news/nb-iot-complete
3GPP TR 38.825 V16.0.0 Study on NR industrial Internet of Things (IoT)	2019-03	https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3492
5G PPP 5G PPP H2020 ICT-18-2018 5G Trials for Cooperative, Connected and Automated Mobility along European 5G Cross-Border Corridors - Challenges and Opportunities	2020-10	https://5g-ppp.eu/wp-content/uploads/2020/10/5G-for-CCAM-in-Cross-Border-Corridors_5G-PPP-White-Paper-Final2.pdf
5GAA Tele-operated Driving Use Cases, System Architecture and Business Considerations	2021-12	https://5gaa.org/news/tele-operated-driving-use-cases-system-architecture-and-business-considerations/
All Industrial Internet Architecture	2016-12	http://en.ii-alliance.org/index.php?m=content&c=index&a=show&catid=17&id=25
AIOTI Application-Centric Security, Privacy & Trust in IoT	2019-06	https://aioti.eu/wp-content/uploads/2019/06/Webinar_Nr1_ApplicationCentric_SecurityPrivacyTrustInIoT_ArthursLegal_v2019.1_vPresented.pdf
AIOTI Computing Continuum Scenarios, Requirements and Optical Communication enablers	2022-04	https://aioti.eu/wp-content/uploads/2022/04/AIOTI-Computing-Continuum-Final.pdf
AIOTI High Priority IoT Standardisation Gaps and Relevant SDOs Release 2.0	2020-01	https://aioti.eu/wp-content/uploads/2020/01/AIOTI-WG3-High-Priority-Gaps-v2.0-200128-Final.pdf
AIOTI Identifiers in Internet of Things (IoT)	2018-02	https://aioti.eu/wp-content/uploads/2018/03/AIOTI-Identifiers_in_IoT-1_0.pdf.pdf
AIOTI IoT and Edge Computing impact on Beyond 5G: enabling technologies and challenges	2021-09	https://aioti.eu/wp-content/uploads/2021/10/AIOTI-Beyond-5G-R1-Report-Published.pdf
AIOTI IoT High-Level Architecture (HLA) Release 5.0	2020-12	https://aioti.eu/wp-content/uploads/2020/12/AIOTI_HLA_R5_201221_Published.pdf
AIOTI IoT LSP Standard Framework Concepts Release 2.9	2019-10	https://aioti.eu/wp-content/uploads/2019/10/AIOTI-WG3-SDOs-Alliance-Landscape-IoT-LSP-standard-framework-R2.9-Published.pdf
AIOTI Ontology Landscape	2021-12	https://aioti.eu/wp-content/uploads/2022/02/AIOTI-Ontology-Landscape-Report-R1-Published-1.0.1.pdf
AIOTI Semantic IoT Solutions - A Developer Perspective	2019-10	https://www.researchgate.net/publication/336679022_Semantic_IoT_Solutions_-_A_Developer_Perspective

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AIoTI Towards semantic interoperability standards based on ontologies	2019-10	https://www.researchgate.net/publication/336677616_Towards_Semantic_Interoperability_Standards_based_on_Ontologies
ASTM ASTM F3463-21 Standard Guide for Ensuring the Safety of Connected Consumer Products	2021-10	https://www.astm.org/f3463-21.html
bioTope D2.7 V2.0 bioTope SoS Reference Platform Specification	2018-03	https://storage.ning.com/topology/rest/1.0/file/get/35619929?profile=original
bioTope D3.3 V1.0 Context-Sensitive Security, Privacy Management, Adaptation Framework	2017-03	https://st11.ning.com/topology/rest/1.0/file/get/1065330?profile=original
bioTope D3.5 Prototype of Platform Integration using API Mediators	2017-06	https://st11.ning.com/topology/rest/1.0/file/get/1065014?profile=original
bioTope D3.6 V2.0 Information Source Publication and Consumption Framework	2018-01	https://storage.ning.com/topology/rest/1.0/file/get/35619932?profile=original
bioTope D5.2 V1.0 Service Composition Framework	2017-01	https://st11.ning.com/topology/rest/1.0/file/get/1064994?profile=original
bioTope D5.5 V2.0 Service Composition Framework	2017-12	https://storage.ning.com/topology/rest/1.0/file/get/35619974?profile=original
bioTope D6.4 V1.0 Proof-of-Concept "Greater Lyon Pilot" Implementation	2018-01	https://storage.ning.com/topology/rest/1.0/file/get/35619978?profile=original
bioTope D6.5 V1.0 Proof-of-Concept "Brussels-Capital Region Pilot" Implementation	2018-02	https://storage.ning.com/topology/rest/1.0/file/get/35619888?profile=original
bioTope D6.6 V1.0 Proof-of-Concept "Helsinki Pilot" Implementation	2018-02	https://storage.ning.com/topology/rest/1.0/file/get/35619980?profile=original
C2C-CC C2CCC_RS_2035 Objectives	2021-12	https://www.car-2-car.org/fileadmin/documents/Basic_System_Profile/Release_1.6.1/C2CCC_RS_2035_Objectives.pdf
C2C-CC C2CCC_RS_2036 Features	2021-12	https://www.car-2-car.org/fileadmin/documents/Basic_System_Profile/Release_1.6.1/C2CCC_RS_2036_Features.pdf
C2C-CC C2CCC_RS_2037 Vehicle C-ITS station profile	2021-12	https://www.car-2-car.org/fileadmin/documents/Basic_System_Profile/Release_1.6.1/C2CCC_RS_2037_Profile.pdf
C2C-CC C2CCC_TR_2000 C2CCC_TR_2000_ReleaseOverview - Basic System Profile Release Overview, Release 1.6.1	2021-12	https://www.car-2-car.org/fileadmin/documents/Basic_System_Profile/Release_1.6.1/C2CCC_TR_2000_ReleaseOverview.pdf
CEN Wireless mesh networking - Communication systems for meter data exchange	N/A	https://standards.iteh.ai/catalog/tc/cen/a0640f96-2f0c-4456-af8e-20887cd8b203/cen-tc-294-wg-6
CEN EN 13757-1 Communication systems for meters - Part 1: Data exchange	2021-12	https://standards.cencenelec.eu/dyn/www/?p=CEN:110:0:::FSP_PROJECT.FSP_ORG_
CEN EN 13757-2 Communication systems for meters - Part 2: Wired M-Bus communication	2018-10	https://standards.cencenelec.eu/dyn/www/?p=CEN:110:0:::FSP_PROJECT.FSP_ORG_ID:61821.6275&cs=148E2A53815B1043A00AB94D1340B84A1
CEN EN 13757-2:2018/prA1 Communication systems for meters - Part 2: Wired M-Bus communication	Under development	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT.FSP_LANG_ID:74544.25&cs=1761F4D6E55C0F87848EB2822BAF9FAAF

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CEN EN 13757-3:2018 Communication systems for meters - Part 3: Application protocols	2018-10	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:61820&cs=1699FDB9F0D54F7BB01D7266589ED286A
CEN EN 13757-4:2019 Communication systems for meters - Part 4: Wireless M-Bus communication	2019-11	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:60262&cs=156CDF6A723103E3251766A06586779B6
CEN EN 13757-5 Communication systems for meters - Part 5: Wireless M-Bus relaying	2016-05	https://standards.cencenelec.eu/dyn/www/?p=CEN:110:0:::FSP_PROJECT.FSP_ORG_ID:36150.6275&cs=1B9B9291A8674B58CF7FF96F8B88F5B85
CEN EN 13757-6:2015 Communication systems for meters - Part 6: Local Bus	2016-06	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:41515&cs=14E87496D5D72D87C65ABEBFFCB3BD0AB
CEN EN 13757-7:2018 Communication systems for meters - Part 7: Transport and security services	2018-10	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:61822&cs=107399C785EC0B2EDA CF60D74955A90D5
CEN EN 1434-3:2015 Heat meters - Part 3: Data exchange and interfaces	2016-06	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:41516&cs=157EF44C329D0ADE1DB97DF0406BAA443
CEN EN 16157-1:2018 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 1: Context and framework	2018-12	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:62523&cs=15997C7BB19A97A296D8A7719196409AD
CEN EN 16157-2:2019 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 2: Location referencing	2019-03	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:60747&cs=1C3A140087AD1FDE865115EA876607C93
CEN EN 16157-3:2018 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 3: Situation Publication	2018-12	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:60748&cs=13B159A7784936BDC97A42AFA8C21211A
CEN EN 16157-4:2021 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 4: VMS publication	2021-03	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:68227&cs=19CD8A5DF8D8A747A2648590BAC670053
CEN EN 16157-5:2020 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 5: Measured and elaborated data publications	2020-08	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:68225&cs=15C7361EFFD209FF289AF2AAE0FBC17A1
CEN EN 16157-7:2018 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 7: Common data elements	2018-12	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:62524&cs=14AD3FDA01670AAB7137D7857613CB12B

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CEN EN 16836-1 Communication systems for meters - Wireless mesh networking for meter data exchange - Part 1: Introduction and standardization framework	2017-05	https://standards.cencenelec.eu/dyn/www/?p=CEN:110:0:::FSP_PROJECT.FSP_ORG_ID:41098.6275&cs=1101.9FC07793E83E7C3B39E9E3A6DBF78
CEN EN 16836-2:2016 Communication systems for meters - Wireless mesh networking for meter data exchange - Part 2: Networking layer and stack specification	2017-05	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:41099&cs=181323929D1945B365914E7CE01F502AD
CEN EN 16836-3:2016 Communication systems for meters - Wireless mesh networking for meter data exchange - Part 3: Energy profile specification dedicated application layer	2017-05	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:41100&cs=1C46CE950442B0C43F9EDDAC4585ACF19
CEN EN ISO 14814:2006 Road transport and traffic telematics - Automatic vehicle and equipment identification - Reference architecture and terminology (ISO 14814:2006)	2006-03	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:21173&cs=184DD778D0F4ED9BEEC2F72C92F3FFFB1
CEN CEN/TS 16157-6 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 6: Parking publications	2022-07	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT.FSP_LANG_ID:69724.25&cs=1451A03D2D2D1D87355F1559FEB7FA425
CEN ISO/TS 17425:2016 Intelligent transport systems - Cooperative systems - Data exchange specification for in-vehicle presentation of external road and traffic related data	2016-06	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:35914&cs=10C18F278124980B9F4075E355AB45BC3
CEN ISO/TS 17429:2017 Intelligent transport systems - Cooperative ITS - ITS station facilities for the transfer of information between ITS stations	2017-04	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:35915&cs=1DF674B52BAF01613F1CDAABBB1D408E6
CEN ISO/TS 19091:2019 Intelligent transport systems - Cooperative ITS - Using V2I and I2V communications for applications related to signalized intersections	2019-07	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:64994&cs=155A0F218787309EC4D33F96797394306
CEN ISO/TS 19321:2020 Intelligent transport systems - Cooperative ITS - Dictionary of in-vehicle information (IVI) data structures	2020-10	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:68350&cs=1FE9288D0BD55B9A6A45F662E5E523F64
CEN ISO/TS 19321:2020 Intelligent transport systems - Cooperative ITS - Dictionary of in-vehicle information (IVI) data structures	2020-10	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:68350&cs=1FE9288D0BD55B9A6A45F662E5E523F65
CEN ISO/TS 19468:2022 Intelligent transport systems - Data interfaces between centres for transport information and control systems - Platform-independent model specifications for data exchange protocols for transport information and control systems	2022-02	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:71962&cs=18889333092FF2E127C49B472E09BA2FB

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CEN prCEN ISO/TS 19321 rev Intelligent transport systems — Cooperative ITS — Dictionary of in-vehicle information (IVI) data structures	Under development	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT.FSP_LANG_ID:73937.25&cs=108B9C05FB5433B566ACFD5122C7E1F9
CEN prEN 13757-8 Communication systems for meters - Part 8: Adaptation layer	Under development	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT.FSP_LANG_ID:73097.25&cs=19B94878D7D6F98142DFDE0433CC7D3C1
CEN prEN 14154-4 Water meters — Part 4: Additional functionalities	Under development	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT.FSP_LANG_ID:73396.25&cs=1DA0D2906520CD899CB94F5BB61C72E7F
CEN/CENELEC CWA 17431 Principles and guidance for licensing Standard Essential Patents in 5G and the Internet of Things (IoT), including the Industrial Internet	2019-06	https://www.cencenelec.eu/media/CEN-CENELEC/CWAs/ICT/cwa17431.pdf
CEN/TR 17167:2018 Communication system for meters - Accompanying TR to EN 13757-2,-3 and -7, Examples and supplementary information	2018-04	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:61828&cs=1338F0A4C7239DOEC0470C6E1605E2BCF
CEN/TS 16157-10:2022 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 10: Energy infrastructure publications	2022-03	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:71189&cs=17C8E7FC7390CF7CC48C34700D0A825D
CEN/TS 16157-11 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 11: Publication of machine interpretable traffic regulations	2022-03	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:71777&cs=10465408B33310E1C137C3B2AAB7CE51
CEN/TS 16157-12 Intelligent transport systems — DATEX II management and information — Part 12: Facilities publications	2022-05	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT.FSP_LANG_ID:73025.25&cs=191FBA7A8FAE57738466F76A27106F67D
CEN/TS 16157-8 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 8: Traffic management publications and extensions dedicated to the urban environment	2020-04	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:68653&cs=18BC2B0B4960475D11D2ABEA1D8C23A2D
CEN/TS 16157-9 Intelligent transport systems - DATEX II data exchange specifications for traffic management and information - Part 9: Traffic signal management publications dedicated to the urban environment	2020-04	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:68652&cs=18B5180A209437120996363BB8237DDAC
CEN/TS 16614-1:2020 Public transport - Network and Timetable Exchange (NetEx) - Part 1: Public transport network topology exchange format	2020-04	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT:66892&cs=1CAED5ABB1179CBAE5D7E61C865704C55
CENELEC CLC/prTS 50491-7 Home and Building Electronic Systems - IT security and data protection - User Guide	Under development	https://standards.cencenelec.eu/dyn/www/?p=305:110:0:::FSP_PROJECT.FSP_LANG_ID:75291.25&cs=1AC4B90B75A5026B198062B2BBB1F96BE

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CENELEC EN 17529:2022 Cybersecurity and Data Protection	2022-05	https://standards.cencenelec.eu/dyn/www/?p=CEN:110:0:::FSP_PROJECT.FSP_ORG_ID:63633.2307986&cs=11F702120AA40D5CC2DD42848140B1806
CENELEC EN 50090 (ISO 14543) Home and Building Electronic Systems (HBES)	2012-02	https://standards.cencenelec.eu/dyn/www/?p=CENELEC:110:::FSP_PROJECT.FSP_ORG_ID:55668.1258281&cs=14BD408738BD97FB5CF4581F27FF76877
CENELEC prEN 17640 Fixed time cybersecurity evaluation methodology for ICT products	Under development	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT.FSP_LANG_ID:70971.25&cs=16CB6A9987F11452CBD61C83CAD57215B
CENELEC prEN 50090-6-3 Home and Building Electronic Systems (HBES)- Part 6-3 -3rd Party HBES IoT API	Under development	https://standards.cencenelec.eu/dyn/www/?p=305:110:0:::FSP_PROJECT.FSP_LANG_ID:74475.25&cs=1046EE8EC4361FACC3F6370EBB7B68089
CENELEC prEN IEC 63345 Energy Efficiency Systems - Simple External Consumer Display	Under development	https://standards.cencenelec.eu/dyn/www/?p=305:110:0:::FSP_PROJECT.FSP_LANG_ID:74332.25&cs=10C4D76ADB0C4C7D5B9DA81FF8E547C2D
CENELEC prEN IEC 63402 Energy Efficiency Systems - Smart Grid - Customer Energy Management Systems - General Requirements and Architecture	Under development	https://standards.cencenelec.eu/dyn/www/?p=305:110:0:::FSP_PROJECT.FSP_LANG_ID:74575.25&cs=167DD57F4AA099C41201ADC1979E157B2
CENELEC prEN XXXXX Security Evaluation Standard for IoT Platforms (SESIP)	Under development	https://standards.cencenelec.eu/dyn/www/?p=205:110:0:::FSP_PROJECT.FSP_LANG_ID:74909.25&cs=157BB6AD851BD6F80A208E00FBBD6B8DD
Contiki Contiki-NG Contiki-NG, the OS for Next Generation IoT Devices	2017/01	https://www.contiki-ng.org/
CSA ZigBee Document 13-0402-14 Base Device Behaviour Specification - ZigBee Document 13-0402-14	2016-02	https://csa-iot.org/developer-resource/specifications-download-request/
CSA-IOT Zigbee Document 05-3474-22 Zigbee Specification	2017-04	https://csa-iot.org/developer-resource/specifications-download-request/
CSA-IOT Zigbee Document 075123 Cluster Library Specification	2019-12	https://csa-iot.org/developer-resource/specifications-download-request/
CSA-IOT Zigbee Document 07-5356-21 Zigbee Smart Energy Standard	2017-06	https://csa-iot.org/developer-resource/specifications-download-request/
CSA-IOT Zigbee Document 14-0563-18 Zigbee PRO Green Power feature specification Basic functionality set V1.1.1	2019-11	https://csa-iot.org/developer-resource/specifications-download-request/
CSA-IOT ZigBee Document 15-0014-05 ZigBee Lighting & Occupancy Device Specification	2016-02	https://csa-iot.org/developer-resource/specifications-download-request/
DIN/DKE DIN SPEC 16593-1 Reference Model for Industry 4.0 Service Architectures - Part 1: Basic Concepts of an Interaction-based Architecture	2018-04	www.beuth.de/de/technische-regel/din-spec-16593-1/287632675
Eclipse Foundation Eclipse IoT-Testware	N/A	https://projects.eclipse.org/projects/technology.iottestware
ECSSO System security and certification considerations	2022-01	https://www.youtube.com/watch?v=mXiytFIOXeI

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EEBUS SHIP (Smart Home IP) and SPINE (Smart Premises Interoperable Neutral Message Exchange)	N/A	www.eebus.org/media-downloads/#specifications
Energetics ETP v1.2 Energetics Transfer Protocol (ETP) v1.2 (2021)	2021-09	https://www.energetics.org/energetics-releases-v1-2-of-energetics-transfer-protocol/
ENISA Baseline Security Recommendations for IoT	2017-11	https://www.enisa.europa.eu/publications/baseline-security-recommendations-for-iot
ENISA Good practices for IoT and Smart Infrastructures Tool	N/A	https://www.enisa.europa.eu/topics/iot-and-smart-infrastructures/iot/good-practices-for-iot-and-smart-infrastructures-tool
ENISA IoT Security Standards Gap Analysis	2019-01	https://www.enisa.europa.eu/publications/iot-security-standards-gap-analysis
ETSI DTR/MTS-TST11Sec_IoTconf Methods for Testing and Specification (MTS); Security validation of IoT architecture application and conformity Case Study Experiences	2022-05	https://portal.etsi.org/webapp/WorkProgram/Report_Workitem.asp?WKI_ID=66188
ETSI DTS/MTS-TST10SecTest_IoTmodule Methods for Testing and Specification (MTS); Security Testing; IoT Security Functional Modules	To be published in 2023-07	https://portal.etsi.org/webapp/WorkProgram/Report_Workitem.asp?WKI_ID=66187
ETSI EG 202 798 ITS; Testing; Framework for conformance and interoperability testing	2011-01	http://www.etsi.org/deliver/etsi_eg/202700_202799/202798/01_01_01_60/eg_202798v010101p.pdf
ETSI EN 300 175-1 Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview	2022-03	http://www.etsi.org/deliver/etsi_en/300100_300199/30017501/02_09_01_60/en_30017501v020901p.pdf
ETSI EN 302 065-1 Short Range Devices (SRD) using Ultra Wide Band technology (UWB); Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 1: Requirements for Generic UWB applications	2016-11	http://www.etsi.org/deliver/etsi_en/302000_302099/30206501/02_01_01_60/en_30206501v020101p.pdf
ETSI EN 302 636-1 ITS; Vehicular Communications; GeoNetworking; Part 1: Requirements	2014-04	http://www.etsi.org/deliver/etsi_en/302600_302699/30263601/01_02_01_60/en_30263601v010201p.pdf
ETSI EN 302 637-2 ITS; Vehicular Communications; Basic Set of Applications; Part 2: Specification of Cooperative Awareness Basic Service	2019-04	http://www.etsi.org/deliver/etsi_en/302600_302699/30263702/01_04_01_60/en_30263702v010401p.pdf
ETSI EN 302 637-3 ITS; Vehicular Communications; Basic Set of Applications; Part 3: Specifications of Decentralized Environmental Notification Basic Service	2019-04	http://www.etsi.org/deliver/etsi_en/302600_302699/30263703/01_03_01_60/en_30263703v010301p.pdf
ETSI EN 302 663 ITS; ITS-G5 Access layer specification for Intelligent Transport Systems operating in the 5 GHz frequency band	2020-01	http://www.etsi.org/deliver/etsi_en/302600_302699/302663/01_03_01_60/en_302663v010301p.pdf
ETSI EN 302 665 ITS; Communications Architecture	2010-09	http://www.etsi.org/deliver/etsi_en/302600_302699/302665/01_01_01_60/en_302665v010101p.pdf
ETSI EN 303 613 ITS; LTE-V2X Access layer specification for Intelligent Transport Systems operating in the 5 GHz frequency band	2020-01	http://www.etsi.org/deliver/etsi_en/303600_303699/303613/01_01_01_60/en_303613v010101p.pdf

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ETSI EN 303 645 CYBER; Cyber Security for Consumer Internet of Things: Baseline Requirements	2020-06	https://www.etsi.org/deliver/etsi_en/303600_303699/303645/02.01.01_60/en_303645v020101p.pdf
ETSI GR CIM 011 Context Information Management (CIM); NGSI-LD Testing Framework: Test Purposes Description Language (TPDL)	2021-04	https://www.etsi.org/deliver/etsi_gr/CIM/001_099/011/01.01.01_60/gr_CIM011v010101p.pdf
ETSI GR IP6 001 IPv6 Deployment in the Enterprise	2017-06	https://www.etsi.org/deliver/etsi_gr/IP6/001_099/001/01.01.01_60/gr_IP6001v010101p.pdf
ETSI GR IP6 008 IPv6-based Internet of Things Deployment of IPv6-based Internet of Things	2017-06	https://www.etsi.org/deliver/etsi_gr/IP6/001_099/008/01.01.01_60/gr_IP6008v010101p.pdf
ETSI GS CIM 016 Context Information Management (CIM); NGSI-LD Testing Framework: Test Template	2021-04	https://www.etsi.org/deliver/etsi_gs/CIM/001_099/016/01.01.01_60/gs_CIM016v010101p.pdf
ETSI GS LTN 002 Low Throughput Networks (LTN) - Functional Architecture	2014-09	https://www.etsi.org/deliver/etsi_gs/LTN/001_099/002/01.01.01_60/gs_LTN002v010101p.pdf
ETSI GS LTN 003 Low Throughput Networks (LTN) - Protocols and Interfaces	2014-09	https://www.etsi.org/deliver/etsi_gs/LTN/001_099/003/01.01.01_60/gs_LTN003v010101p.pdf
ETSI GS NGP 005 Next Generation Protocol Requirements	2017-04	https://www.etsi.org/deliver/etsi_gs/NGP/001_099/005/01.01.01_60/gs_NGP005v010101p.pdf
ETSI SAREF ontology SAREF: the Smart Applications REference ontology	2020-02	https://saref.etsi.org/core/
ETSI SR 003 680 SmartM2M; Guidelines for Security, Privacy and Interoperability in IoT System Definition; A Concrete Approach	2020-03	http://www.etsi.org/deliver/etsi_sr/003600_003699/003680/01.01.01_60/sr_003680v010101p.pdf
ETSI SR 003 809 eHEALTH; The role of ICT to enable Health crisis management and recovery; Responding to the 2019 SARS-CoV-2 Pandemic	2021-12	https://www.etsi.org/deliver/etsi_sr/003800_003899/003809/01.01.02_60/sr_003809v010102p.pdf
ETSI TR 101 607 ITS; Cooperative ITS (C-ITS); Release 1	2020-02	http://www.etsi.org/deliver/etsi_tr/101600_101699/101607/01.02.01_60/tr_101607v010201p.pdf
ETSI TR 102 638 ITS; Vehicular Communications; Basic Set of Applications; Release 2	2009-06	http://www.etsi.org/deliver/etsi_tr/102600_102699/102638/01.01.01_60/tr_102638v010101p.pdf
ETSI TR 103 249 Low Throughput Network (LTN); Use Cases and System Characteristics	2017-10	http://www.etsi.org/deliver/etsi_tr/103200_103299/103249/01.01.01_60/tr_103249v010101p.pdf
ETSI TR 103 290 Machine-to-Machine communications (M2M); Impact of Smart City Activity on IoT Environment	2015-04	http://www.etsi.org/deliver/etsi_tr/103200_103299/103290/01.01.01_60/tr_103290v010101p.pdf
ETSI TR 103 375 SmartM2M; IoT Standards landscape and future evolutions	2016-10	http://www.etsi.org/deliver/etsi_tr/103300_103399/103375/01.01.01_60/tr_103375v010101p.pdf
ETSI TR 103 376 SmartM2M; IoT LSP use cases and standards gaps	2016-10	http://www.etsi.org/deliver/etsi_tr/103300_103399/103376/01.01.01_60/tr_103376v010101p.pdf
ETSI TR 103 394 Smart Body Area Networks (SmartBAN); System Description	2018-01	http://www.etsi.org/deliver/etsi_tr/103300_103399/103394/01.01.01_60/tr_103394v010101p.pdf

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ETSI TR 103 467 Speech and multimedia Transmission Quality (STQ); Quality of Service aspects for IoT; Discussion of QoS aspects of services related to the IoT ecosystem	2018-06	https://www.etsi.org/deliver/etsi_tr/103400_103499/103467/01.01.01_60/tr_103467v010101p.pdf
ETSI TR 103 514 DECT; DECT-2020 New Radio (NR) interface; Study on Physical (PHY) layer	2018-07	https://www.standict.eu/sites/default/files/2021-01/tr_103514v010101p.pdf
ETSI TR 103 515 DECT; Study on URLLC use cases of vertical industries for DECT evolution and DECT-2020	2018-03	https://www.etsi.org/deliver/etsi_tr/103500_103599/103515/01.01.01_60/tr_103515v010101p.pdf
ETSI TR 103 527 SmartM2M; Virtualized IoT Architectures with Cloud Back-ends	2018-07	http://www.etsi.org/deliver/etsi_tr/103500_103599/103527/01.01.01_60/tr_103527v010101p.pdf
ETSI TR 103 528 SmartM2M; Landscape for open source and standards for cloud native software applicable for a Virtualized IoT service layer	2018-08	http://www.etsi.org/deliver/etsi_tr/103500_103599/103528/01.01.01_60/tr_103528v010101p.pdf
ETSI TR 103 533 Security; Standards Landscape and best practices	2019-08	https://www.etsi.org/deliver/etsi_tr/103500_103599/103533/01.01.01_60/tr_103533v010101p.pdf
ETSI TR 103 534-1 Teaching Material: Part 1 (Security)	2019-08	https://www.etsi.org/deliver/etsi_tr/103500_103599/10353401/01.01.01_60/tr_10353401v010101p.pdf
ETSI TR 103 534-2 Teaching Material: Part 2 (Privacy)	2019-10	https://www.etsi.org/deliver/etsi_tr/103500_103599/10353402/01.01.01_60/tr_10353402v010101p.pdf
ETSI TR 103 535 Guidelines for semantic interoperability in the industry	2019-10	https://www.etsi.org/deliver/etsi_tr/103500_103599/103535/01.01.01_60/tr_103535v010101p.pdf
ETSI TR 103 536 Strategic/technical approach on how to achieve interoperability/interworking of existing standardized IoT Platforms	2019-12	https://www.etsi.org/deliver/etsi_tr/103500_103599/103536/01.01.02_60/tr_103536v010102p.pdf
ETSI TR 103 537 Plugtests™ preparation on Semantic Interoperability	2019-09	https://www.etsi.org/deliver/etsi_tr/103500_103599/103537/01.01.01_60/tr_103537v010101p.pdf
ETSI TR 103 545 SmartM2M; Pilot test definition and guidelines for testing cooperation between oneM2M and Ag equipment standards	2018-08	http://www.etsi.org/deliver/etsi_tr/103500_103599/103545/01.01.01_60/tr_103545v010101p.pdf
ETSI TR 103 582 EMTEL; Study of use cases and communications involving IoT devices in provision of emergency situations	2019-07	https://www.etsi.org/deliver/etsi_tr/103500_103599/103582/01.01.01_60/tr_103582v010101p.pdf
ETSI TR 103 591 Privacy study report; Standards Landscape and best practices	2019-10	https://www.etsi.org/deliver/etsi_tr/103500_103599/103591/01.01.01_60/tr_103591v010101p.pdf
ETSI TR 103 674 SmartM2M; Artificial Intelligence and the oneM2M architecture	2021-02	http://www.etsi.org/deliver/etsi_tr/103600_103699/103674/01.01.01_60/tr_103674v010101p.pdf
ETSI TR 103 714 SmartM2M; Study for oneM2M; Discovery and Query use cases and requirements	2020-07	http://www.etsi.org/deliver/etsi_tr/103700_103799/103714/01.01.01_60/tr_103714v010101p.pdf
ETSI TR 103 717 SmartM2M; Study for oneM2M; Discovery and Query specification development	2021-07	http://www.etsi.org/deliver/etsi_tr/103700_103799/103717/01.01.01_60/tr_103717v010101p.pdf
ETSI TR 103 751 Smart Body Area Networks (SmartBAN); Implant communications	2021-04	http://www.etsi.org/deliver/etsi_tr/103700_103799/103751/01.01.01_60/tr_103751v010101p.pdf

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ETSI TR 103 778 SmartM2M; Use cases for cross-domain data usability of IoT devices	2021-12	http://www.etsi.org/deliver/etsi_tr/103700_103799/10378/01.01.01_60/tr_103778v010101p.pdf
ETSI TR 103 783 SmartM2M; SAREF: SDT interoperability and oneM2M base ontology alignment	2022-05	https://www.etsi.org/deliver/etsi_tr/103700_103799/103783/01.01.01_60/tr_103783v010101p.pdf
ETSI TR 118 503 V1.0.0 Architecture Part 2: Study for the merging of architectures proposed for consideration	2015-04	https://2020.standict.eu/sites/default/files/tr_118503v010000p.pdf
ETSI TS 102 731 ITS; Security; Security Services and Architecture	2010-09	http://www.etsi.org/deliver/etsi_ts/102700_102799/102731/01.01.01_60/ts_102731v010101p.pdf
ETSI TS 102 894-2 ITS; Users and applications requirements; Part 2: Applications and facilities layer common data dictionary	2018-08	http://www.etsi.org/deliver/etsi_ts/102800_102899/10289402/01.03.01_60/ts_10289402v010301p.pdf
ETSI TS 102 939-1 DECT; Ultra Low Energy (ULE); Machine to Machine Communications; Part 1: Home Automation Network (phase 1)	2017-10	https://www.etsi.org/deliver/etsi_ts/102900_102999/10293901/01.03.01_60/ts_10293901v010301p.pdf
ETSI TS 102 940 ITS; Security; ITS communications security architecture and security management	2018-04	http://www.etsi.org/deliver/etsi_ts/102900_102999/102940/01.03.01_60/ts_102940v010301p.pdf
ETSI TS 103 246-1 Satellite Earth Stations and Systems (SES); GNSS based location systems; Part 1: Functional requirements	2020-10	http://www.etsi.org/deliver/etsi_ts/103200_103299/10324601/01.03.01_60/ts_10324601v010301p.pdf
ETSI TS 103 264 SmartM2M; Smart Applications; Reference Ontology and oneM2M Mapping	2020-02	https://www.etsi.org/deliver/etsi_ts/103200_103299/103264/03.01.01_60/ts_103264v030101p.pdf
ETSI TS 103 267 SmartM2M; Smart Applications; Communication Framework	2020-02	http://www.etsi.org/deliver/etsi_ts/103200_103299/103267/02.01.01_60/ts_103267v020101p.pdf
ETSI TS 103 300-3 ITS; Vulnerable Road Users (VRU) awareness; Part 3: Specification of VRU awareness basic service; Release 2	2021-04	http://www.etsi.org/deliver/etsi_ts/103300_103399/10330003/02.01.02_60/ts_10330003v020102p.pdf
ETSI TS 103 301 ITS; Vehicular Communications; Basic Set of Applications; Facilities layer protocols and communication requirements for infrastructure services	2020-02	http://www.etsi.org/deliver/etsi_ts/103300_103399/103301/01.03.01_60/ts_103301v010301p.pdf
ETSI TS 103 325 Smart Body Area Network (SmartBAN); Low Complexity Medium Access Control (MAC) for SmartBAN	2015-04	http://www.etsi.org/deliver/etsi_ts/103300_103399/103325/01.01.01_60/ts_103325v010101p.pdf
ETSI TS 103 326 Smart Body Area Network (SmartBAN); Enhanced Ultra-Low Power Physical Layer	2021-07	http://www.etsi.org/deliver/etsi_ts/103300_103399/103326/01.02.01_60/ts_103326v010201p.pdf
ETSI TS 103 327 Smart Body Area Networks (SmartBAN); Service and application standardized enablers and interfaces, APIs and infrastructure for interoperability management	2019-04	http://www.etsi.org/deliver/etsi_ts/103300_103399/103327/01.01.01_60/ts_103327v010101p.pdf
ETSI TS 103 357 Short Range Devices; Low Throughput Networks (LTN); Protocols for radio interface A	2018-06	http://www.etsi.org/deliver/etsi_ts/103300_103399/103357/01.01.01_60/ts_103357v010101p.pdf
ETSI TS 103 358 Short range devices; Low Throughput Networks (LTN) Architecture; LTN Architecture	2018-06	http://www.etsi.org/deliver/etsi_ts/103300_103399/103358/01.01.01_60/ts_103358v010101p.pdf

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ETSI TS 103 378 Smart Body Area Networks (SmartBAN) Unified data representation formats, semantic and open data model	2015-12	http://www.etsi.org/deliver/etsi_ts/103300_103399/103378/01.01.01_60/ts_103378v010101p.pdf
ETSI TS 103 410-1 SmartM2M; Extension to SAREF; Part 1: Energy Domain	2020-05	http://www.etsi.org/deliver/etsi_ts/103400_103499/10341001/01.01.02_60/ts_10341001v010102p.pdf
ETSI TS 103 424 Publicly Available Specification (PAS); Smart Machine-to-Machine communications (SmartM2M)	2016-11	http://www.etsi.org/deliver/etsi_tr/103500_103599/103527/01.01.01_60/tr_103527v010101p.pdf
ETSI TS 103 544-1 Publicly Available Specification (PAS); ITS; MirrorLink; Part 1: Connectivity	2019-10	http://www.etsi.org/deliver/etsi_ts/103500_103599/10354401/01.03.01_60/ts_10354401v010301p.pdf
ETSI TS 103 596-1 V1.1.1 (Methods for Testing and Specification (MTS); Test Specification for CoAP; Part 1: Conformance Tests	2021-05	https://www.etsi.org/deliver/etsi_ts/103500_103599/10359601/01.01.01_60/ts_10359601v010101p.pdf
ETSI TS 103 596-2 V1.1.1 Methods for Testing and Specification (MTS); Test Specification for CoAP; Part 2: Security Tests	2021-05	https://www.etsi.org/deliver/etsi_ts/103500_103599/10359602/01.01.01_60/ts_10359602v010101p.pdf
ETSI TS 103 596-3 V1.1.1 Methods for Testing and Specification (MTS); Test Specification for CoAP; Part 3: Performance Tests	2021-05	https://www.etsi.org/deliver/etsi_ts/103500_103599/10359603/01.01.01_60/ts_10359603v010101p.pdf
ETSI TS 103 597-1 V1.1.2 Methods for Testing and Specification (MTS); Test Specification for MQTT; Part 1: Conformance Tests	2021-01	https://www.etsi.org/deliver/etsi_ts/103500_103599/10359701/01.01.02_60/ts_10359701v010102p.pdf
ETSI TS 103 597-2 V1.1.1 Methods for Testing and Specification (MTS); Test Specification for MQTT; Part 2: Security Tests	2021-04	https://www.etsi.org/deliver/etsi_ts/103500_103599/10359702/01.01.01_60/ts_10359702v010101p.pdf
ETSI TS 103 597-3 V1.1.1 Methods for Testing and Specification (MTS); Test Specification for MQTT; Part 3: Performance Tests	2021-01	https://www.etsi.org/deliver/etsi_ts/103500_103599/10359703/01.01.01_60/ts_10359703v010101p.pdf
ETSI TS 103 646 V1.1.1 Methods for Testing and Specification (MTS); Test Specification for foundational Security IoT-Profile	2021-01	https://www.etsi.org/deliver/etsi_ts/103600_103699/103646/01.01.01_60/ts_103646v010101p.pdf
ETSI TS 103 673 SmartM2M; SAREF Development Framework and Workflow, Streamlining the Development of SAREF and its Extensions	2020-08	http://www.etsi.org/deliver/etsi_ts/103600_103699/103673/01.01.01_60/ts_103673v010101p.pdf
ETSI TS 103 701 CYBER; Cyber Security for Consumer Internet of Things: Conformance Assessment of Baseline Requirements	2021-08	https://www.etsi.org/deliver/etsi_ts/103700_103799/103701/01.01.01_60/ts_103701v010101p.pdf
ETSI TS 103 735 SmartM2M; Smart Lifts IoT System	2021-07	http://www.etsi.org/deliver/etsi_ts/103700_103799/103735/01.01.02_60/ts_103735v010102p.pdf
ETSI TS 103 757 SmartM2M; Asynchronous Contact Tracing System; Fighting pandemic disease with Internet of Things (IoT)	2021-08	http://www.etsi.org/deliver/etsi_ts/103700_103799/103757/02.01.01_60/ts_103757v020101p.pdf

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ETSI TS 103 779 SmartM2M; Requirements and Guidelines for cross-domain data usability of IoT devices	2022-05	https://www.etsi.org/deliver/etsi_ts/103700_103799/103779/01.01.01_60/ts_103779v010101p.pdf
ETSI TS 103 780 SmartM2M; SAREF: oneM2M usage guidelines	Under development	Not available yet
ETSI TS 103 849 Smart M2M; Smart Escalators IoT System	2022-08	https://www.etsi.org/deliver/etsi_ts/103700_103799/103735/01.01.01_60/ts_103735v010101p.pdf
FIT IoT Lab FIT IoT-LAB Testbed The Very Large Scale Internet of Things Testbed	2014-06	https://www.ietf-lab.info/
FIWARE Foundation FIWARE Internet of Things Framework	2018-01	https://www.fiware.org/
GS1 EPCIS EPC Information Services (EPCIS) Standard, v1.2 (2016)	2022-06	https://ref.gs1.org/standards/epcis/
HL7 International FHIR Fast Healthcare Interoperability Resources (FHIR) v4.0.1 (2019)	2022-05	http://hl7.org/fhir/directory.html
HL7 International HL7 V2.9 HL7 Version 2 Messaging Standard	2019-12	http://www.hl7.org/implement/standards/product_brief.cfm?product_id=516
IEC Asset Administration Shell for Industrial Applications – Part 2: Information meta model	Under development	https://www.iec.ch/dyn/www/?p=103:38:7310547639:17753:::FSP_ORG_ID:FSP_APEX_PAGE:FSP_PROJECT_ID:1250.23.109017
IEC IEC role in the IoT	2018-10	https://www.iec.ch/basecamp/iec-role-iot
IEC Internet of Things: Wireless Sensor Networks	2014-11	https://www.iec.ch/basecamp/internet-things-wireless-sensor-networks
IEC IoT 2020: Smart and secure IoT platform	2016-10	https://www.iec.ch/basecamp/iot-2020-smart-and-secure-iot-platform
IEC 60869-1:2018 Fibre optic interconnecting devices and passive components - Fibre optic passive power control devices - Part 1: Generic specification	2018-11-16	https://webstore.iec.ch/publication/60884
IEC 60875-1:2015 Fibre optic interconnecting devices and passive components - Non-wavelength-selective fibre optic branching devices - Part 1: Generic specification	2015-05-07	https://webstore.iec.ch/publication/22396
IEC 61300-1:2022 Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 1: General and guidance	2022-04-04	https://webstore.iec.ch/publication/67663
IEC 61406 ED1 Identification Link	Under development	https://www.iec.ch/ords/?p=103:38:4010308328493:10:::FSP_ORG_ID:FSP_APEX_PAGE:FSP_PROJECT_ID:1452.23.104621
IEC 61753-1:2018 Fibre optic interconnecting devices and passive components - Performance standard - Part 1: General and guidance	2018-08-15	https://webstore.iec.ch/publication/67249
IEC 61754-4:2022 Fibre optic interconnecting devices and passive components - Fibre optic connector interfaces - Part 4: Type SC connector family	2022-02-28	https://webstore.iec.ch/publication/29284

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IEC 61754-7-3:2019 Fibre optic interconnecting devices and passive components - Fibre optic connector interfaces - Part 7-3: Type MPO connector family - Two fibre rows 16 fibre wide	2019-04-05	https://webstore.iec.ch/publication/26692
IEC 61756-1:2019 Fibre optic interconnecting devices and passive components - Interface standard for fibre management systems - Part 1: General and guidance	2019-11-27	https://webstore.iec.ch/publication/59508
IEC 61987-1:2006 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 1: Measuring equipment with analogue and digital output	2006-12-14	https://webstore.iec.ch/publication/6225
IEC 61987-10:2009 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 10: List of Properties (LOPs) for Industrial-Process Measurement and Control for Electronic Data Exchange - Fundamentals	2009-07-23	https://webstore.iec.ch/publication/6227
IEC 61987-11:2016 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 11: List of properties (LOPs) of measuring equipment for electronic data exchange - Generic structures	2016-12-15	https://webstore.iec.ch/publication/32275
IEC 61987-12:2016 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 12: Lists of properties (LOPs) for flow measuring equipment for electronic data exchange	2016-03-23	https://webstore.iec.ch/publication/24401
IEC 61987-13:2016 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 13: Lists of properties (LOP) for pressure measuring equipment for electronic data exchange	2016-03-23	https://webstore.iec.ch/publication/24400
IEC 61987-14:2016 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 14: Lists of properties (LOP) for temperature measuring equipment for electronic data exchange	2016-04-26	https://webstore.iec.ch/publication/24637
IEC 61987-15:2016 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 15: Lists of properties (LOPs) for level measuring equipment for electronic data exchange	2016-11-08	https://webstore.iec.ch/publication/26177

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IEC 61987-16:2016 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 16: List of properties (LOPs) for density measuring equipment for electronic data exchange	2016-12-15	https://webstore.iec.ch/publication/34265
IEC 61987-31 ED1 List of Properties (LOP) of infrastructure devices for electronic data exchange – Generic structures	Under development	https://www.iec.ch/ords/?p=103:38:4010308328493:10:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:1452,23,102292
IEC 61987-32 ED1 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 32: Lists of properties (LOP) for I/O modules for electronic data exchange	Under development	https://www.iec.ch/ords/?p=103:38:4010308328493:10:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:1452,23,102293
IEC 61987-41 ED1 Generic structures of List of Properties (LOP) of Process Analyzer Technology (PAT) measuring devices for electronic data exchange	Under development	https://www.iec.ch/ords/?p=103:38:4010308328493:10:::FSP_ORG_ID,FSP_APEX_PAGE,FSP_PROJECT_ID:1452,23,107355
IEC 61987-92:2018 Industrial-process measurement and control - Data structures and elements in process equipment catalogues - Part 92: Lists of properties (LOP) of measuring equipment for electronic data exchange - Aspect LOPs	2018-06-05	https://webstore.iec.ch/publication/33096
IEC 62005-1:2001 Reliability of fibre optic interconnecting devices and passive components - Part 1: Introductory guide and definitions	2001-03-07	https://webstore.iec.ch/publication/6280
IEC 62099:2001 Fibre optic wavelength switches - Generic specification	2001-03-30	https://webstore.iec.ch/publication/6459
IEC 62443-2-1:2010 Industrial communication networks - Network and system security - Part 2-1: Establishing an industrial automation and control system security program	2010-11	https://webstore.iec.ch/publication/7030
IEC 62443-2-4:2015 Security for industrial automation and control systems - Part 2-4: Security program requirements for IACS service providers	2015-06	https://webstore.iec.ch/publication/22810
IEC 62443-3-2:2020 Security for industrial automation and control systems - Part 3-2: Security risk assessment for system design	2020-06	https://webstore.iec.ch/publication/30727
IEC 62443-3-2:2020 Security for industrial automation and control systems - Part 3-2: Security risk assessment for system design	2020-06	https://webstore.iec.ch/publication/30727
IEC 62443-3-3:2013 Industrial communication networks - Network and system security - Part 3-3: System security requirements and security levels	2013-08-07	https://webstore.iec.ch/publication/7033
IEC 62443-4-2:2019 Security for industrial automation and control systems - Part 4-2: Technical security requirements for IACS components	2018-01-15	https://webstore.iec.ch/publication/34421

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IEC 62443-4-2:2019 Security for industrial automation and control systems - Part 4-2: Technical security requirements for IACS components	2019-02	https://webstore.iec.ch/publication/34421
IEC 62541-10:2020 OPC Unified Architecture - Part 10: Programs	2020-07-07	https://webstore.iec.ch/publication/61119
IEC 62541-100:2015 OPC Unified Architecture - Part 100: Device Interface	2015-03-25	https://webstore.iec.ch/publication/21987
IEC 62541-11:2020 OPC Unified Architecture - Part 11: Historical Access	2020-06-23	https://webstore.iec.ch/publication/61129
IEC 62541-13:2020 OPC Unified Architecture - Part 13: Aggregates	2020-06-11	https://webstore.iec.ch/publication/61131
IEC 62541-14:2020 OPC Unified Architecture - Part 14: PubSub	2020-07-08	https://webstore.iec.ch/publication/61108
IEC 62541-3:2020 OPC Unified Architecture - Part 3: Address Space Model	2020-07-08	https://webstore.iec.ch/publication/61112
IEC 62541-4:2020 OPC Unified Architecture - Part 4: Services	2020-07-13	https://webstore.iec.ch/publication/61113
IEC 62541-5:2020 OPC Unified Architecture - Part 5: Information Model	2020-07-10	https://webstore.iec.ch/publication/61114
IEC 62541-6:2020 OPC Unified Architecture - Part 6: Mappings	2020-07-13	https://webstore.iec.ch/publication/61115
IEC 62541-7:2020 OPC Unified Architecture - Part 7: Profiles	2020-06-22	https://webstore.iec.ch/publication/61116
IEC 62541-8:2020 OPC Unified Architecture - Part 8: Data Access	2020-06-22	https://webstore.iec.ch/publication/61117
IEC 62541-9:2020 OPC Unified Architecture - Part 9: Alarms and Conditions	2020-06-18	https://webstore.iec.ch/publication/61118
IEC 62714-1:2018 Engineering data exchange format for use in industrial automation systems engineering - Automation Markup Language - Part 1: Architecture and general requirements	2018-04-30	https://webstore.iec.ch/publication/32339
IEC 62714-2:2015 Engineering data exchange format for use in industrial automation systems engineering - Automation markup language - Part 2: Role class libraries	2015-03-30	https://webstore.iec.ch/publication/22030
IEC 62714-3:2017 Engineering data exchange format for use in industrial automation systems engineering - Automation markup language - Part 3: Geometry and kinematics	2017-01-25	https://webstore.iec.ch/publication/34158
IEC 62714-4:2020 Engineering data exchange format for use in industrial automation systems engineering - Automation markup language - Part 4: Logic	2020-06-16	https://webstore.iec.ch/publication/28979
IEC 62714-5:2022 Engineering data exchange format for use in industrial automation systems engineering - Automation markup language - Part 5: Communication	2022-03-11	https://webstore.iec.ch/publication/65493

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IEC 62832-1:2020 Industrial-process measurement, control and automation - Digital factory framework - Part 1: General principles	2020-10	https://webstore.iec.ch/publication/65858
IEC 62832-2:2020 Industrial-process measurement, control and automation - Digital factory framework - Part 2: Model elements	2020-10	https://webstore.iec.ch/publication/60214
IEC 62832-3:2020 Industrial-process measurement, control and automation - Digital factory framework - Part 3: Application of Digital Factory for life cycle management of production systems	2020-10	https://webstore.iec.ch/publication/60277
IEC 62872-2:2022 Industrial-process measurement, control and automation - Part 2: Internet of Things (IoT) - Application framework for industrial facility demand response energy management	2022-02	https://webstore.iec.ch/publication/63419
IEC 63203-801-1 Wearable electronic devices and technologies - Part 801-1: Smart Body Area Network (SmartBAN) - Enhanced Ultra-Low Power Physical Layer	Under development	https://www.iec.ch/dyn/www/?p=103:38:6154992354_31339:::FSP_ORG_ID.FSP_APEX_PAGE.FSP_PROJECT_ID:20537.23.103719
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NGI-0 Discovery NEUROPIIL	Under development	https://gitlab.com/pi-lar/neuropil
NGI-Fed4Fire COMPUTATION OFFLOADING FOR IOT-ENABLED APPLICATIONS	Under development	https://www.fed4fire.eu/demo-stories/oc2/comfort-app/

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NGI-Ontochain ADOS (AirTrace Decentralized Oracle System)	Under development	https://ontochain.ngi.eu/content/ados
NGI-Trust B-Smart	Under development	https://things.is/
NGI-Trust D-SBOM (Distributed Software Bill of Materials)	Under development	https://www.trublo.eu/d-sbom/
NGI-Trust EDGE-TINC	Under development	https://edge-tinc.gitlab.io/fluentic/
NGI-Trust IZI	Under development	https://github.com/mizolotu/izi
NGI-Trust PY	Under development	https://www.panga.fr/
NGI-Trust PY 2.0	Under development	https://www.pyguard.fr/
NGI-Trust Totem	Under development	https://insigh.io/
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OASIS CAP-v1.2 Common Alerting Protocol Version 1.2	2010-07	http://docs.oasis-open.org/emergency/cap/v1.2/CAP-v1.2.html
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OMA ObjLwM2M_Cell_Conn LIGHTWEIGHTM2M CELLULAR CONNECTIVITY	2020-11	https://www.openmobilealliance.org/release/ObjLwM2M_Cell_Conn/V1_1-20201110-A/

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OMA ObjLwM2M_COSE LightweightM2M COSE	2020-11	https://www.openmobilealliance.org/release/ObjLwM2M_COSE/V1_0-20201110-A/
OMA ObjLwM2M_Device LightweightM2M Device	2020-11	https://www.openmobilealliance.org/release/ObjLwM2M_Device/V1_2-20201110-A/
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oneM2M TR-0068-V-0.2.0 AI enablement to oneM2M	2021-11	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34206
oneM2M TS-0001-V4.14.0 Functional Architecture	2022-03	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34648
oneM2M TS-0002-V4.6.0 Requirements	2019-11	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=29274
oneM2M TS-0003-V4.6.0 Security Solutions	2021-10	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34191

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oneM2M TS-0004-V4.9.0 Service Layer Core Protocol	2021-02	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34618
oneM2M TS-0005-V4.0.0 Management Enablement (OMA)	2019-06	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=30113
oneM2M TS-0006-V4.0.0 Management enablement (BBF)	2019-06	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=30114
oneM2M TS-0008- V-4.2.0 CoAP Protocol Binding	2021-10	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34132
oneM2M TS-0009-V4.4.0 HTTP Protocol Binding	2022-02	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34550
oneM2M TS-0011-V4.1.0 Common Terminology	2019-12	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=31396
oneM2M TS-0012-V3.7.3 OneM2M Base Ontology	2019-02	https://www.onem2m.org/images/pdf/TS-0012-Base_Ontology-V3_7_3.pdf
oneM2M TS-0013-V.4.0.0 Interoperability Testing	2021-07	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=33896
oneM2M TS-0020-V2.0.0 WebSocket Protocol Binding (oneM2M TS-0020 version 2.0.0 Release 2)	2016-09-01T02:00:00	https://onem2m.org/images/files/deliverables/Release2/TS-0020_WebSocket_Protocol_Binding_V2_0_0.pdf
oneM2M TS-0021-V2.0.0 oneM2M and AllJoyn Interworking	2016-08	https://www.onem2m.org/images/files/deliverables/Release2/TS-0021-oneM2M_and_AllJoyn_Interworking-V2_0_0.pdf
oneM2M TS-0022-V4_3_0 Field Device Configuration	2022-04	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34724
oneM2M- TS-0023-V4.8.0 SDT based Information Model and Mapping for Vertical Industries	2021-04	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=33779
oneM2M TS-0024-V3.2.2 OCF Interworking	2019-04	https://onem2m.org/images/files/deliverables/Release3/TS-0024-OCF_Interworking-V3_2_2.pdf
oneM2M TS-0026-V4.6.0 3GPP Interworking between oneM2M service layer and 3GPP features	2020-12	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=33174
oneM2M TS-0034-V4.2.0 Semantics Support	2020-08	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=31425
oneM2M TS-0037-V-0.9.0 IoT Public Warning Service Enablement	2020-10	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=32830
oneM2M TS-0040-V0.1.0 Modbus Interworking	2020-07	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=32500
oneM2M WI-0095 System enhancements to support Data Protection Regulations	2019-10	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=30968

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oneM2M WI-0096 Effective IoT Communication to Protect 3GPP Networks	2021-01	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=33091
oneM2M WI-0102 System enhancements to support Data License Management	2020-05	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=32157
oneM2M WI-0104 V0_0_1 SDT based Information Model and Mapping for Vertical Industries – SIMVI	2021-03	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=33391
oneM2M WI-0105 System enhancements to support AI capabilities	2021-06	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=33772
oneM2M WI-0109 IPE-based Device Management with FlexContainers	2022-02	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34558
oneM2M-TR-0006-Study_of_Management_Capability_Enablement-V0_5_1 Study of Management Capability Enablement Technologies for Consideration	2015-04	https://onem2m.org/images/files/deliverables/TR-0006-Study_of_Management_Capability_Enablement-V0_5_1.doc
oneM2M-TR-0026-V-4.8.0 Vehicular Domain Enablement	2019-12	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=31410
oneM2M-TR-0041-V-0.4.0 oneM2M Decentralized Authentication	2018-03	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=26293
oneM2M-TR-0042-V-0.4.0 WoT Interworking	2018-05	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=26945
oneM2M-TR-0043-V-0.2.0 Modbus Interworking	2019-06	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=30112
oneM2M-TR-0044-V-0.6.0 Physical object heterogeneous identification and tracking in oneM2M	2020-02	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=31631
oneM2M-TR-0050-V-0.13.0 Attribute Based Access Control Policy	2020-05	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=32114
oneM2M-TR-0053-V-0.6.0 Lightweight oneM2M Services	2020-03	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=31776
oneM2M-TR-0054-V-0.8.0 oneM2M Service Subscribers and Users	2020-06	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=32207
oneM2M-TR-0057-V-0.6.0 Getting Started with oneM2M	2021-02	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=33407
oneM2M-TR-0058-V-0.0.1: Railway Domain Enablement	2018-12	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=28240
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oneM2M-TR-0061 -V-0.3.0 Study on ontologies for Smart City Services	2021-08	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34704
oneM2M-TR-0064 ZigBee Interworking	2020-04	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=32243
oneM2M-TS-0018-V-4.6.0 Test Suite Structure and Test Purposes	2022-04	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=34702
oneM2M-TS-0036-V-0.0.1 Advanced Vehicular Domain Enablement	2017-11	https://member.onem2m.org/Application/documentapp/downloadLatestRevision/default.aspx?docID=24640
Open Group Reference Architectures and Open Group Standards for the Internet of Things	2016-12	https://publications.opengroup.org/w16d
Open Group IT4IT Open Messaging Interface (O-MI), The Open Group Standard for the Internet of Things (IoT), Version 2.0	2019-12	https://publications.opengroup.org/c19e
Open Group MSA-IoT Microservices Architecture for the Internet of Things (MSA-IoT)	2018-04	https://publications.opengroup.org/g187
Open Group O-DF Open Data Format (O-DF), The Open Group Standard for the Internet of Things (IoT), Version 2.0	2019-12	https://publications.opengroup.org/c19d
RIOT RIOT OS The friendly Operating System for the Internet of Things	2014-05	https://www.riot-os.org/
SAE 6857 Requirements for a Terrestrial Based Positioning, Navigation, and Timing (PNT) System to Improve Navigation Solutions and Ensure Critical Infrastructure Security	2018-04	https://www.sae.org/standards/content/sae6857/
SAE AIR6988 Artificial Intelligence in Aeronautical Systems: Statement of Concerns	2021-04	https://www.sae.org/standards/content/air6988/
SAE ARINC686 Roadmap for IPv6 Transition in Aviation	2020-06	https://www.sae.org/standards/content/arinc686/
SAE ARINC687 Onboard secure Wi-Fi Network Profile Standard	2021-06	https://www.sae.org/standards/content/arinc687/
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SAE J2735 ASN1 V2X Communications Message Set Dictionary™ ASN file	2020-07	https://www.sae.org/standards/content/j2735asn_202007/
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SAE J2945 Guidance Dedicated Short-Range Communication (DSRC) Systems Engineering Process Guidance for SAE J2945/X Documents and Common Design Concepts™	2017-12	https://www.sae.org/standards/content/j2945_201712/

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SAE J2945/1 On-Board System Requirements for V2V Safety Communications	2020-04	https://www.sae.org/standards/content/j2945/1_202004/
SAE J2945/2 Dedicated Short-Range Communications (DSRC) Performance Requirements for V2V Safety Awareness	2018-10	https://www.sae.org/standards/content/j2945/2_201810/
UN P1095 E Negotiation	2022-01	https://uncefact.unece.org/display/uncefactpublic/E+Negotiation
W3C W3C Thing Description (TD) Ontology	2022-02	https://www.w3.org/2019/wot/td
W3C DIDs Decentralized Identifiers (DIDs) v1.0 (2021)	2021-08	www.w3.org/TR/did-core/
W3C JSON-LD 1.1 A JSON-based Serialization for Linked Data	2020-07	www.w3.org/TR/json-ld11/
W3C ODRL Information Model 2.2 Open Digital Rights Language (ODRL) Information Model 2.2	2018-02	www.w3.org/TR/odrl-model/
W3C OGC 16-079 W3C Semantic Sensor Network Ontology	2017-10	https://www.w3.org/TR/vocab-ssn/
W3C RDF Resource Description Framework (RDF) v1.1 (2014)	2014-02	www.w3.org/RDF/
W3C Verifiable Credentials Data Model v1.1 Verifiable Credentials Data Model v1.1 (2021)	2022-03	www.w3.org/TR/vc-data-model/
WITSML WITSML WITSML (Well-site Information Transfer Standard Markup Language) 2.0 (2016)	2016-11	http://docs.energistics.org/WITSML/WITSML_TOPICS/WITSML-000-000-titlepage.html





StandICT.eu has received funding from the European Union's Horizon 2020 (H2020) research and innovation programme under the Grant Agreement no. GA 951972.