IEEE SA STANDARDS ASSOCIATION

This document contains supplemental information referenced by the European Rolling Plan for ICT Standardisation.

IEEE Standards Activities in the Internet of Things (IoT)

Overview

IEEE serves as the gathering place for the global technical community working on the Internet of Things (IoT), as demonstrated by the many ongoing activities of the IEEE Internet of Things Initiative. The IEEE IoT Initiative provides the platform where professionals learn, share knowledge, and collaborate on the sweeping convergence of technologies, markets, applications, and the Internet. The success of IoT depends strongly on standardization, which provides interoperability, compatibility, reliability, and effective operations on a global scale.

IEEE has a number of existing standards (current and under development), activities, and events that are directly related to creating the environment needed for a vibrant IoT, recognising the value of the IoT to industry and the benefits this technology innovation brings to the public. Some key standards activities are:

- Architectural framework: The focus of IEEE P2413-2019 is to develop a standard for the architectural framework for the Internet of Things, which includes descriptions of various IoT domains, definitions of IoT domain abstractions, and identification of commonalities between different IoT domains. The architectural framework defined in this standard will promote cross-domain interaction, aid system interoperability and functional compatibility.

- Harmonization and security of IoT: The IEEE 1451-99 is focused on developing a standard for harmonization of Internet of Things (IoT) devices and systems. This standard defines a method for data sharing, interoperability, and security of messages over a network, where sensors, actuators and other devices can interoperate, regardless of underlying communication technology.

- Sensor Performance and Quality: Sensors are fundamental to IoT ecosystem with large volume of different sensors integrated into a complex framework. IEEE 2700 proposes a common framework for sensor performance specification terminology, units, conditions and limits is provided. IEEE P2510 defines quality measures, controls, parameters and definitions for sensor data related to Internet of Things (IoT) implementations.

Relevant Standards Activities

IEEE Standards Series*

- IEEE Std 802.3 series on Ethernet
- IEEE Std802.11 series on wireless LAN
- IEEE Std 802.15 series on wireless personal area networks
- IEEE Std 802.16 series on broadband wireless access mobility enhancements
- IEEE Std 1451 series, addressing sensors (adopted by ISO/IEC)
- IEEE Std 1547 series on handling distributed resources in electric power systems
- IEEE Std 1609 series on intelligent transportation
- IEEE Std 1888 series, addressing ubiquitous green community control networks

- IEEE Std 1900 series on dynamic spectrum access
- IEEE Std 1901 series on broadband over powerline networks
- IEEE Std 2030 series on the Smart Grid, including electric vehicle infrastructure
- IEEE Std 2040 series on connected, automated, and intelligent vehicles
- IEEE Std 11073 series on point-of-care medical device communication (adopted as ISO/IEEE)

Approved Standards*

- IEEE Std 754-2008, (Adopted as ISO/IEC/IEEE 60559:2011) IEEE Standard for Floating-Point Arithmetic
- IEEE Std 1284-2000 (R2011), IEEE Standard Signaling Method for a Bidirectional Parallel Peripheral Interface for Personal Computers
- IEEE Std 1285-2005, IEEE Standard for Scalable Storage Interface
- IEEE Std 1301.3-1992, IEEE Standard for a Metric Equipment Practice for Microcomputers--Convection-Cooled With 2.5mm Connectors
- IEEE Std 1377-2012, IEEE Standard for Utility Industry Metering Communication Protocol Application Layer (End Device Data Tables)
- IEEE Std 1394-2008, IEEE Standard for a High-Performance Serial Bus
- ANSI/IEEE Std 1675-2008, IEEE Standard for Broadband Over Powerline Hardware
- IEEE Std 1701-2011, IEEE Standard for Optical Port Communication Protocol to Complement the Utility Industry End Device Data Tables
- IEEE Std 1702-2011, IEEE Standard for Telephone Modem Communication Protocol to Complement the Utility Industry End Device Data Tables
- IEEE Std 1703-2012, IEEE Standard for Local Area Network/Wide Area Network (LAN/WAN) Node Communication Protocol to Complement the Utility Industry End Device Data Tables
- IEEE Std 1775-2010, IEEE Standard for Power Line Communication Equipment--Electromagnetic Compatibility (EMC) Requirements--Testing and Measurement Methods
- IEEE Std 1815-2012, IEEE Standard for Electric Power Systems Communications--Distributed Network Protocol (DNP3)
- IEEE Std 1856-2017, Standard Framework for Prognostics and Health Management of Electronic Systems
- IEEE Std 1902.1-2009, IEEE Standard for Long Wavelength Wireless Network Protocol
- IEEE Std 1904.1-2013, IEEE Standard for Service Interoperability in Ethernet Passive Optical Networks (SIEPON)
- IEEE Std 1904.1-Conformance01-2014, IEEE Standard for Conformance Test Procedures for Service Interoperability in Ethernet Passive Optical Networks, IEEE Std 1904.1 Package A
- IEEE Std 1904.1-Conformance02-2014, IEEE Standard for Conformance Test Procedures for Service Interoperability in Ethernet Passive Optical Networks, IEEE Std 1904.1 Package B
- IEEE Std 1904.1-Conformance03-2014, IEEE Standard for Conformance Test Procedures for Service Interoperability in Ethernet Passive Optical Networks, IEEE Std 1904.1 Package C
- IEEE Std 1905.1-2013, IEEE Standard for a Convergent Digital Home Network for Heterogeneous Technologies
- IEEE Std 2200-2012, IEEE Standard Protocol for Stream Management in Media Client Devices

Current New or Revision Projects*

- IEEE P754, Standard for Floating-Point Arithmetic
- IEEE P1906.1.1, Standard Data Model for Nanoscale Communication Systems

- IEEE P1912, Standard for Privacy and Security Architecture for Consumer Wireless Devices
- IEEE P1931.1, Standard for an Architectural Framework for Real-time Onsite Operations Facilitation (ROOF) for the Internet of Things
- IEEE P1934, Draft Standard for Adoption of OpenFog Reference Architecture for Fog Computing
- IEEE P1935, Standard for Edge/Fog Manageability and Orchestration
- IEEE P2301, Guide for Cloud Portability and Interoperability Profiles (CPIP)
- IEEE P2302, Standard for Intercloud Interoperability and Federation (SIIF)
- IEEE P2303, Standard for Adaptive Management of Cloud Computing Environments
- IEEE P2413, Standard for an Architectural Framework for the Internet of Things
- IEEE P2557, Standard for Ambient Genetics Frameworks
- IEEE P2558, Standard for Ambient Objects
- IEEE P2668, Standard for Maturity Index of Internet-of-things: Evaluation, Grading and Ranking
- IEC/IEEE P62704-4, Standard for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body from Wireless Communications Devices, 30 MHz-6 GHz: General Requirements for Using the Finite Element Method (FEM) for SAR Calculations and Specific Requirements for Modeling Vehicle-Mounted Antennas and Personal Wireless Devices

Pre-standardization Industry Connections Activities

- IC12-003, IEEE Intercloud Testbed

**Draft standards projects, once approved, are often revised and/or used as the base for new projects. The status of these projects is updated periodically. For the most up-to-date status, please see the following link: <https://standards.ieee.org/project/index.html>*