

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

IEEE Standards Activities in Cloud/Edge/Fog Computing

Overview

Cloud computing offers the promise of ubiquitous, scalable, on-demand computing resources provided as a service for everything from mobile devices to supercomputers. Cloud computing offers end consumers a “pay as you go” model— a powerful shift for computing towards a utility model like the electricity system, the telephone system, or more recently the Internet.

The concept of a cloud operated by one service provider or enterprise interoperating with a cloud operated by another provider is a powerful means of increasing the value of cloud computing to industry and users. Such federation is called the “Intercloud.” IEEE is creating technical standards for this interoperability.

Two more concepts related to cloud computing are edge computing and fog computing. These are based on the fact that technology is making it possible to distribute processing into many devices e.g. laptops, mobile phones, and to home and enterprise locations and thus computing resources are not limited to large computing data centers.

Relevant Standards Activities *[A partial list.]*

Approved Standards*

- [IEEE 802.3-2015](#), IEEE Standard for Ethernet
- [IEEE 802.3.1-2013](#), IEEE Standard for Management Information Base (MIB) Definitions for Ethernet
- [IEEE 802.11-2016](#), IEEE Standard for Information Technology—Telecommunications and information exchange between systems--Local and metropolitan area networks--Specific requirements--Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications
- IEEE [802.15.1-2005](#) (R2010), IEEE Standard for Information Technology --Telecommunications and information exchange between systems--Local and metropolitan area networks--Specific requirements--Part 15.1: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Wireless Personal Area Networks (WPANs)
- IEEE [802.15.2-2003](#) (R2009), IEEE Recommended Practice for Information Technology--Local and metropolitan area networks--Specific requirements--Part 15.2: Coexistence of Wireless Personal Area Networks with Other Wireless Devices Operating in Unlicensed Frequency Bands
- [IEEE 802.15.3-2016](#), IEEE Standard for Information Technology--Local and metropolitan area networks--Specific requirements--Part 15.3: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for

High Rate Wireless Personal Area Networks (WPANs)

- [IEEE 802.15.4-2015](#), IEEE Standard for Local and metropolitan area networks--Part 15.4: Low-Rate Wireless Personal Area Networks (LR-WPANs)
- [IEEE 802.15.4q-2016](#), IEEE Standard for Low-Rate Wireless Networks --Amendment 2: Ultra-Low Power Physical Layer
- [IEEE 802.15.4t-2017](#), IEEE Standard for Low-Rate Wireless Networks--Amendment 4: Higher Rate (2 Mb/s) Physical (PHY) Layer
- [IEEE 802.15.5-2009](#), IEEE Recommended Practice for Information Technology--Telecommunications and information exchange between systems--Local and metropolitan area networks--Specific requirements--Part 15.5: Mesh Topology Capability in Wireless Personal Area Networks (WPANs)
- [IEEE 802.15.6-2012](#), IEEE Standard for Local and metropolitan area networks--Part 15.6: Wireless Body Area Networks
- [IEEE 802.16-2017](#), IEEE Standard for Air Interface for Broadband Wireless Access Systems
- [IEEE 1609.0-2013](#), IEEE Guide for Wireless Access in Vehicular Environments (WAVE)--Architecture
- [IEEE 1906.1-2015](#), IEEE Recommended Practice for Nanoscale and Molecular Communication Framework
- [IEEE 1934-2018](#), IEEE Standard for Adoption of OpenFog Reference Architecture for Fog Computing

Current New or Revision Projects*

- [IEEE P1935](#), IEEE Draft Standard for Edge/Fog Manageability and Orchestration
- [IEEE P2301](#), IEEE Draft Guide for Cloud Portability and Interoperability Profiles(CPIP)
- [IEEE P2302](#), IEEE Draft Standard for Intercloud Interoperability and Federation (SIIF)
- [IEEE P2303](#), IEEE Draft Standard for Adaptive Management of Cloud Computing Environments
- [IEEE P2557](#), IEEE Draft Standard for Ambient Genetics Frameworks
- [IEEE P2558](#), IEEE Draft Standard for Ambient Objects
- [IEEE P1906.1.1](#), IEEE Draft Standard Data Model for Nanoscale Communication Systems

**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>*

