

IEEE Standard for an Architectural Framework for the Internet of Things (IOT)

IEEE Computer Society

Developed by the
IEEE SA Board of Governors / Corporate Advisory Group (BoG/CAG)

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Developed by the

IEEE SA Board of Governors/Corporate Advisory Group (BoG/CAG)
of the
IEEE Computer Society

Approved 21 May 2019

IEEE SA Standards Board

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Abstract: An architecture framework description for the Internet of Things (IoT) which conforms to the international standard ISO/IEC/IEEE 42010:2011 is defined. The architecture framework description is motivated by concerns commonly shared by IoT system stakeholders across multiple domains (transportation, healthcare, Smart Grid, etc.). A conceptual basis for the notion of things in the IoT is provided and the shared concerns as a collection of architecture viewpoints is elaborated to form the body of the framework description.

Keywords: architectural framework, IEEE 2413™, Internet of Things (IoT)

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Introduction

This introduction is not part of IEEE Std 2413-2019, IEEE Standard for an Architectural Framework for the Internet of Things (IoT).

This document has four logical parts:

- **Part 1: IoT domains**
 - Description of behaviors and applications of IoT domains (see Clause 4)
- **Part 2: Domain commonalities and shared concerns**
 - Discussion of the core characteristics across IoT domains (see Clause 5)
- **Part 3: IoT architecture framework**
 - ISO/IEC/IEEE 42010:2011 conformant description of the architecture framework (see Clause 6)¹
- **Part 4: Examples of IoT architectures**
 - Domain-specific ISO/IEC/IEEE 42010:2011 conformant architectural description

¹ Information on references can be found in Clause 2.

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IEEE Standard for an Architectural Framework for the Internet of Things (IoT)

1. Overview

1.1 Scope

This standard defines an architecture framework description for the Internet of Things (IoT). The architecture ontology and methodology of the framework architecture conforms to the international standard ISO/IEC/IEEE 42010:2011.

The architecture framework description is motivated by concerns commonly shared by IoT system stakeholders across multiple domains (transportation, healthcare, Smart Grid, etc.). This standard provides a conceptual basis for the notion of things in the IoT and then elaborates the shared concerns as a collection of architecture viewpoints that form the body of the framework description.

1.2 Purpose

The IoT is predicted to become one of the most significant drivers of growth in many technology markets. The architectural framework defined in this standard will promote cross-domain interaction, aid system interoperability and functional compatibility, and further fuel the growth of the IoT market. The standard will address stakeholder concerns to help them build a connected world that can interoperate while meeting both the needs of enterprises and society for trustworthiness of IoT systems. The adoption of a unified approach to the development of IoT systems will reduce industry fragmentation and create a critical mass of multi-stakeholder activities around the world.

The motivation for the standard as informed by stakeholder concerns and desired outcome is to build stakeholder confidence through the following:

- a) Provide a framework for vendors to build conformant, interoperable, secure, IoT systems that can span multiple application domains.
- b) Provide a framework for buyers to make comparisons and assessments of such systems.
- c) Provide a framework for system designers to accelerate design, implementation, and deployment processes of such systems.