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ISO/IEC CD 20924

ISO/IEC JTC 1/WG 10

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Information technology — Internet of Things — Definition and Vocabulary

CD stage

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Foreword

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The committee responsible for this document is ISO/IEC JTC 1/WG 10.

Information technology Title — Internet of Things — Definition and Vocabulary

1 Scope

This International Standard provides a definition of Internet of Things along with a set of terms and definitions. This International Standard is a terminology foundation for the Internet of Things.

2 Normative references

None

3 Terms and definitions

3.1
actuator
a component which conveys digital information to effect a change of some property of a physical entity
[SOURCE: IoT-A]

3.2
address
value that identifies a location
[SOURCE: ISO/IEC 2382-7:2000, 07.09.07]

3.3
application software
software that is specific to the solution of an application problem
[SOURCE: ISO/IEC 2382-20, 20.01.15]

3.4
architecture
(system) fundamental concepts or properties of a system in its environment embodied in its elements, relationships, and in the principles of its design and evolution
[SOURCE: ISO/IEC/IEEE 42010:2011, 3.2][JLEE1]

3.5
asset
anything that has value to the [stakeholder], its business operations and its continuity

3.6
attribute
characteristic or property of an entity that can be used to describe its state, appearance, or other aspects

EXAMPLE: An entity type, address information, telephone number, a privilege, a MAC address, a domain name are possible attributes
[SOURCE: ISO/IEC 24760-1:2011, 3.1.3]

3.7
automatic identification system
system for achieving accurate and unambiguous identification of a data bearing label, tag, transponder or a natural/prescribed feature, the data or feature being interrogated by means of a system appropriate source
[SOURCE: ISO/IEC 19762, 01.01.38]

3.8
characteristics
abstraction of a property of an object or a set of

Note: Characteristics are used for describing concepts
[Source: ISO 1087-1:2000 (3.2.4)][JLEE2]

3.9
component
a modular, deployable, and replaceable part of a system that encapsulates implementations
[SOURCE: ISO/TS 19104:2008, B.50]

Note 1: a component may expose or use interfaces (local or on a network) to interact with other entities. A Component which exposes or uses network interfaces is called an Endpoint.

Note 2: see also "functional component": that specialization of the component concept is consistent with this definition except that it is not deployable, as it is a part of a logical architecture and not part of an implementation architecture.

3.10
conceptual model
common structure and definitions for describing the concepts and relationships within an IoT system
[SOURCE: ISO/IEC 20006-1:2014, 4.8, modified]

Editor's Note: (To be deleted if no comments)
term "IoT" added to fit this standard

3.11
data carrier
device or medium used to store data as a relay mechanism in an AIDC system

NOTE: Bar code, OCR character string and RF tag are examples of data carriers
[SOURCE: ISO/IEC 19762, 01.01.59]

3.12
digital entity
any computational or data element of an IT-based system, and it may exist as a service based in a data centre or cloud, or a network element or a gateway.

3.13
digital user
a non-human user of the IoT system and it includes automation services that act on behalf of human users.

3.14
discovery
a service to find unknown resources/entities/services based on a rough specification of the desired result. It may be utilized by a human or another service. Credentials for authorization are considered when executing the discovery.
[SOURCE: IoT-A]

3.15
domain
class of all entities of similar group and common characteristic
[SOURCE: ISO 14813-5:2010, B.1.49]

3.16
endpoint
a component that exposes or uses network interfaces
[ISO/IEC 24791-1:2010, 4.5 modified]

Editor's Note: (To be deleted if no comments)
The original text is "one of two components that implements or exposes an interface to other components or uses the interface of another component"

3.17
entity
item inside or outside an information and communication technology system such as a person, an organization, a device, a subsystem, or a group of such items that has recognizably distinct existence
[SOURCE: ISO/IEC 24760-1:2011, 3.1.1]

3.18
end-to-end security
security (including privacy and information integrity) for the exchange of information between two or more end points that relies on protocols and mechanisms that are implemented exclusively on those endpoints
[SOURCE: ISO/IEC TR 26927:2011, 3.10]

3.19
function
a special kind of activity proper to anything; the mode of action by which it fulfils its purpose. Also in generalized application, especially as contrasted with structure
[SOURCE: Oxford English Dictionary]

Editor's Note: (To be deleted if no comments)
Contribution from WG 10 experts requested on the use of OED definition for this term. Provide the contribution as (1) Use of OED definition is sufficient for this IS; or (2) Use of OED definition is not sufficient for this IS. In case (2), the contributor is requested to provide the contribution on the definition for this term.

3.20
functional component
a functional building block needed to engage in an activity, realized by an implementation
[SOURCE: ISO/IEC 17789:2014, 3.2.3, modified]

Editor's Note: (To be deleted if no comments)
The original word "backed " had been replaced with "realized".

3.21
human user
an IoT user.

3.22
identifier
information that unambiguously distinguishes one entity from another one in a given identity context.

3.23
identity
characteristics determining who or what a person or thing is.

3.24
identity context
the environment where an entity can use a set of attributes for identification and other purposes.

3.25
interface
shared boundary between two functional components, defined by various characteristics pertaining to the functions, physical interconnections, signal exchanges, and other characteristics, as appropriate
[SOURCE: ISO/IEC 13066-1:2011, 2.15, modified]

Editor's Note: (To be deleted if no comments)
The original word "units " had been replaced with "components".

3.26
interface device
a hardware component or system of components that allows a human being to interact with a computer, a telephone system, or other electronic information system
[SOURCE: http://whatis.techtarget.com/definition/interface-device-IDF]

3.27
Internet of Things (IoT)
an infrastructure of interconnected objects, people, systems and information resources together with intelligent services to allow them to process information of the physical and the virtual world and react

3.28
interoperability
capability to communicate, execute programs, or transfer data among various functional units in a manner that requires the user to have little or no knowledge of the unique characteristics of those units
[SOURCE: ISO/IEC 2382-1:1993, 01.01.47]

3.29
IoT Device
a component that can be a single or a combination of the following elements:

- Sensors, which provide information about the Physical Entity

- Tags, which are used to identify Physical Entities

- Actuators, which can modify the physical state of a Physical Entity [IOT-A,RERUM].

Note 1: An IoT device can be either attached to or embedded inside a Physical Entity, or monitor a Physical Entity in its vicinity. [Short OED]

Note 2: Several IoT specifications have used the term Device for this concept. However, the term Device in the English dictionary has a much broader context, which is why this RA introduces IoT as a more specific concept.

3.30
IoT Domain

set of entities which in an IoT context have similar characteristics and share the same rules

3.31
IoT Gateway
a forwarding device enabling the connections between the sensing or actuating subsystem in the real environment and other subsystems or networks.

3.32
IoT system
a system that is comprised of functions that provide the system the capabilities for identification, sensing, actuation, communication, and management, and applications and services to a user
[SOURCE: Internet of Things: A Hands on Approach, Bahga & Madisetti, 2014]

3.33
IoT User
an entity that is interested in interacting with a physical or virtual entity

3.34
local storage
special type of resource that contains information about one or only a few entities in the vicinity of a device
[SOURCE: IoT-A]

3.35
location technologies
All technologies whose primary purpose is to establish and communicate the location of a device e.g. GPS, RTLS, etc
[SOURCE: IoT-A]

3.36
look-up
service that addresses exiting known resources using a key or identifier cf. Discovery
[SOURCE: IoT-A]

3.37
network
an entity that connects endpoints, sources to destinations, and may itself act as a value added element in the IoT system or services.

3.38
network interface
set of operations accessible on a network, that characterizes the behaviour of an endpoint.

3.39
machine-to-machine (M2M) communication
refer to physical telecommunication based interconnection for data exchange between two ETSI M2M compliant entities, like: device, gateways, and network infrastructures, etc.
[SOURCE: ETSI TR 102 725]

3.40
on-device resource
resource hosted inside a Device and enabling access to the Device and thus to the related Physical Entity
[SOURCE: IoT-A]

3.41
physical entity
a thing that is discrete, identifiable, and observable, and having material existence in real world

3.42
reference architecture
description of common features, common vocabulary, guidelines, interrelations and interactions among the entities, and a template for an IoT architecture

3.43
sensor
a component that senses or measures certain characteristics of the real world and transfers them into a digital representation. [IoT-A]

3.44
service operator
one who owns administration rights on the services it provides and/or on the entities it owns, is able to negotiate partnership with equivalent counterparts and define polices specifying how a service can be accessed by users

Editor's note:
network operator def. is needed if not in RA doc.

3.45
resource
any element of a data processing system needed to perform required operations
[SOURCE: ISO/IEC 2382-1:1993, 01.01.23]

3.46
Radio Frequency Identification (RFID)
use of electromagnetic or inductive coupling in the radio frequency portion of the spectrum to communicate to or from a tag through a variety of modulation and encoding schemes to uniquely read the identity of an RF Tag
[SOURCE: ISO/IEC 19762:2014, 05.01.01]

3.47
service
service is a distinct part of the functionality that is provided by an entity through interfaces [ISO/TR 14252:1996].

3.48
service provider
abstract representation of all entities that provide a service to peer service users
[SOURCE: ISO/IEC 2382-26:1993, 26.03.10]

3.49
stakeholder
person or organisation that can affect, be affected by, or perceive themselves to be affected by a decision or activity

Note: A decision maker can be a stakeholder.
[SOURCE: ISO Guide 73:2009]

3.50
sensor
device that observes and measures a physical property of a natural phenomenon or man-made process and converts that measurement into a signal
Note: Signal can be electrical, chemical, etc
[SOURCE: ISO 29182-2:2013, 2.1.5]

3.51
unilateral authentication
entity authentication that provides one entity with assurance of the other's identity but not vice versa
[SOURCE: ISO/IEC 9798-5:2009, 2.28]

3.52
user
A Human or any Active Digital Entity that is interested in interacting with a particular physical object
[SOURCE: IoT-A]

3.53
virtual entity
a discrete software, firmware, or data, e.g., computing device/system or virtual data storage, that performs a task or tasks. It is a digital representation of a physical entity