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Internet of things (IoT) and digital twin – Vocabulary

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INTERNET OF THINGS (IoT) AND DIGITAL TWIN – VOCABULARY

FOREWORD

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ISO/IEC 20924 has been prepared by subcommittee 41: Internet of Things and Digital Twin, of ISO/IEC joint technical committee 1: Information technology. It is an International Standard.

This third edition cancels and replaces the second edition published in 2021. This edition constitutes a technical revision.

This edition includes the following technical changes with respect to the previous edition:

a) addition of new terms which are used in other ISO/IEC IoT related standards;
b) update of some definitions to align with current usage in IoT standards;
c) extension of digital twin related vocabularies with title and scope changes.

The text of this International Standard is based on the following documents:

Draft	Report on voting
JTC1-SC41/386/FDIS	JTC1-SC41/404/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1, and the ISO/IEC Directives, JTC 1 Supplement available at www.iec.ch/members_experts/refdocs and www.iso.org/directives.

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INTERNET OF THINGS (IoT) AND DIGITAL TWIN – VOCABULARY

1 Scope

This document provides a definition of Internet of Things and digital twin along with a set of terms and definitions. This document is a terminology foundation for the Internet of Things and digital twin.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1 General terms

3.1.1
application
software designed to fulfil a particular purpose

[SOURCE: ISO/IEC 24713-2:2008, 4.1, modified – "program or piece of" has been ~~removed~~ deleted from the beginning of the definition.]

3.1.2
architecture
~~<system>~~ set of fundamental concepts or properties of ~~a system~~ an entity in its environment ~~embodied in its elements, relationships, and in the principles of its design and evolution~~

Note 1 to entry: Governing principles are covered in the architecture description and are not part of the architecture.

[SOURCE: ISO/IEC/IEEE 42010:~~2011~~2022, 3.2, modified – "set of" has been added to the beginning of the definition, "and governing principles for the realization and evolution of this entity and its related life cycle processes" has been deleted from the end of the definition, and Note 1 to entry has been added.]

3.1.3
asset
entity (3.1.17) that has potential or actual value ~~and is either owned by or under the custody of~~ to an individual, an organization, a government, or other groups

3.1.4
availability
property of being accessible and usable upon demand by an authorized *entity* (3.1.17)

Note 1 to entry: *IoT systems* (3.2.15) can include both *human users* (3.1.18) and service components as "authorized entities".

[SOURCE: ISO/IEC 27000:2018, 3.7]

~~**3.1.6**~~
~~**characteristic**~~
~~abstraction of a property of an *entity* or of a set of entities~~

~~[SOURCE: ISO 18104:2014, 3.1.4]~~

3.1.5
cloud computing
paradigm for enabling *network* (3.1.24) access to a scalable and elastic pool of shareable physical or virtual resources with self-service provisioning and administration on demand

[SOURCE: ~~ISO/IEC 17788:2014, 3.2.5~~ ISO/IEC 22123-1:2023, 3.1.1, modified – Notes 1 and 2 to entry have been deleted.]

3.1.6
cloud service
one or more capabilities offered via *cloud computing* (3.1.5) invoked using a defined *interface* (3.1.22)

[SOURCE: ~~ISO/IEC 17788:2014, 3.2.8~~ ISO/IEC 22123-1:2023, 3.1.2]

3.1.7
cloud service provider
party ~~which makes *cloud services* available~~ that is acting in a cloud service provider role

[SOURCE: ~~ISO/IEC 17788:2014, 3.2.15~~ ISO/IEC 22123-1:2023, 3.3.3]

3.1.8
cloud service provider role
CSP role
set of activities that make cloud services available

[SOURCE: ISO/IEC 22123-1:2023, 3.3.15]

~~**3.1.10**~~
~~**compliance**~~
~~conformance to rules, such as those defined by a law, a regulation, a standard, or a policy~~

3.1.9
component
modular, deployable, and replaceable part of a system

[SOURCE: ISO 14813-5:2010, B.1.31, modified – "that encapsulates implementation and exposes a set of interfaces" has been deleted from the end of the definition.]

3.1.10
confidentiality
property that *information* (3.1.21) is not made available or disclosed to unauthorized individuals, entities, or processes

[SOURCE: ISO/IEC 27000:2018, 3.10]

3.1.11
data
symbol or symbols represented in a digital and formalized manner suitable for communication, storage, interpretation or processing

3.1.12
data store
persistent repository for ~~digital~~ *data* (3.1.11)

Note 1 to entry: A data store can be accessed by a single *entity* (3.1.17) or shared by multiple entities via a *network* (3.1.24) or other connection.

3.1.13
digital entity
~~computational element and/or data element~~

entity (3.1.17) that exists in the digital realm

Note 1 to entry: A digital entity can exist in several forms, including a *cloud service* (3.1.6) or as a *service* (3.1.28) in a data centre, or as a *network* (3.1.24) element or as an *IoT gateway* (3.2.14).

3.1.14
discovery service
service (3.1.28) to find resources, entities or services based on a specification, keywords, search terms, or tags of the desired target

Note 1 to entry: A discovery service can be used by a *human user* (3.1.18) or a *digital user* (3.2.4).

3.1.15
endpoint
component (3.1.8) that exposes ~~or~~ and uses one or more *network* (3.1.24) *interfaces* (3.1.22)

3.1.16
endpoint address
<endpoint> ~~value~~ character or group of characters that can be used to identify an *endpoint* (3.1.15), which can designate the originating source or destination of *data* (3.1.11) being transmitted

3.1.17
entity
anything (physical or non-physical) having a distinct existence

[SOURCE: ISO/IEC 15459-3:2014, 3.1]

~~**3.1.19**~~
~~**functional component**~~
~~functional building block needed to engage in an activity, backed by an implementation~~

~~Note 1 to entry: See also "*component*", which is a superset containing all functional components and other types of *component* that are deployable.~~

~~[SOURCE: ISO/IEC 17789:2014, 3.2.3, modified – Note 1 to entry has been added.]~~

3.1.18
human user
natural person who uses a system

3.1.19
identifier
information (3.1.21) that unambiguously distinguishes one *entity* (3.1.17) from other entities in a given *identity context* (3.1.20)

3.1.20
identity context
environment where an *entity* (3.1.17) can be sufficiently identified by a certain set of its attributes and values

3.1.21
information
data (3.1.11) that within a certain context has a particular meaning

3.1.22
interface
shared boundary between two functional *components* (3.1.8), defined by various characteristics pertaining to the functions, physical interconnections, signal exchanges, and other characteristics

[SOURCE: ISO/IEC 13066-1:2011, 2.15, modified – In the definition, "units" has been replaced by "components"; ", as appropriate" has been deleted from the end of the definition.]

3.1.23
interoperability
ability of two or more systems or *applications* (3.1.1) to exchange *information* (3.1.21) and to mutually use the information that has been exchanged

[SOURCE: ~~ISO/IEC 17788:2014, 3.1.5~~ ISO/IEC 22123-1:2023, 3.6.1]

3.1.24
network
data network
digital network
infrastructure that connects a set of *endpoints* (3.1.15), enabling communication of *data* (3.1.11) between the digital entities reachable through them

3.1.25
physical entity
entity (3.1.17) in the physical world that can be the subject of sensing and/or actuating

Note 1 to entry: In the Internet of Things reference architecture, the physical entity is a thing that can be sensed and/or actuated by IoT devices or IoT systems.

3.1.26
reference architecture
~~framework used as a template when developing or validating an architecture description for a particular solution~~

architecture description for a specific subject area that guides and constrains the structure and behaviour of a related set of systems of interest

3.1.27
safety
state in which the risk of harm (to persons) or damage is limited to an acceptable level

[SOURCE: ISO 21101:2014, 3.34]

3.1.28
service
distinct functionality that is provided by an *entity* (3.1.17) through *interfaces* (3.1.22)

[SOURCE: ISO/IEC TR 14252:1996, 2.2.2.46, modified – In the definition, "part of the functionality" has been replaced by "functionality" and "on one side of an interface to an entity on the other side of the interface" has been replaced by "through *interfaces* (3.1.22)".]

3.1.29
service provider
organization that manages and delivers a service or services to customers

[SOURCE: ISO/IEC 20000-10:2018, 3.2.24]

3.1.30
socialized
having organized and constructive behaviour of functions in a system or among systems built with the attributes of the division of labour and the collaboration of tasks

[SOURCE: ISO/IEC TR 30174:2021, 3.4]

3.1.31
stakeholder
individual~~, team~~, organization, or classes thereof, having an interest, right, share, or claim, in ~~a system~~ an entity of interest

[SOURCE: ISO/IEC/IEEE 42010:~~2011~~2022,~~ 3.10~~ 3.17, modified – "role, position" has been deleted from the beginning of the definition; the EXAMPLE has been deleted.]

3.1.32
tag
human- or machine-readable mark, or digital identity used to communicate *information* (3.1.21) about an *entity* (3.1.17)

Note 1 to entry: A tag can contain information that can be read by sensors to aid in identification of the *physical entity* (3.1.25).

3.1.33
trustworthiness
ability to meet stakeholder expectations in a demonstrable, verifiable and measurable way

~~Note 1 to entry: Depending on the context or sector, and also on the specific product or service, data, and technology used, different characteristics apply and need verification to ensure stakeholders' expectations are met.~~

~~Note 2 to entry: Characteristics of trustworthiness include, for instance, reliability, availability, resilience, security, privacy, safety, accountability, transparency, integrity, authenticity, quality, usability and accuracy.~~

~~Note 3 to entry: Trustworthiness is an attribute that can be applied to services, products, technology, data and information as well as, in the context of governance, to organizations.~~

3.1.34
virtual entity
digital entity that represents a *physical entity* (3.1.25)

3.1.35
wearable device
~~electronic device intended to be located near to, on or in a body~~

IoT device designed for operation near to, on, or inside of a body