ISO/IEC 29182-2

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8800 знаков (с нумерацией)

1 Scope

This part of ISO/IEC 29182 is intended to facilitate the development of international standards in sensor networks. It presents terms and definitions for selected concepts relevant to the field of sensor networks. It establishes a general description of concepts in this field and identifies the relationships among those concepts. It may also be used as guidance for development of other parts of ISO/IEC 29182 and any other sensor network related standard.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1 General

2.1.1

actuator

device that provides a physical output in response to an input signal in a predetermined way

2.1.2

backbone network

network that connects to sensor network gateways through different access networks to transmit information from sensor network to service provider or user

Note 1 to entry: The Internet is one example of backbone networks.

2.1.3

entity

unit having distinct set of attributes and connected to other unit(s) defined in the sensor network reference architecture

2.1.4

personal area network

network consisting of sensor nodes, communication devices, or networked peripheral devices all in the vicinity of a person

2.1.5

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 1 to entry: Signal can be electrical, chemical, etc.

2.1.6

sensor network

system of spatially distributed sensor nodes interacting with each other and, depending on applications, possibly with other infrastructure in order to acquire, process, transfer, and provide information

extracted from its environment with a primary function of information gathering and possible control capability

Note 1 to entry: Distinguishing features of a sensor network can include wide area coverage, use of radio networks, flexibility of purpose, self-organization, openness, and providing data for multiple applications.

2.1.7

sensor network gateway

sensor network element that connects a sensor network to another network with different architectures or protocols, permitting information exchange between them

Note 1 to entry: Sensor network gateway functionalities may include address or protocol translation.

2.1.8

sensor node

sensor network element that includes at least one sensor and, optionally actuators with communication capabilities and data processing capabilities

Note 1 to entry: It may include additional application capabilities.

2.2 Reference architecture

2.2.1

reference architecture

framework that provides common features collected from different types of sensor networks not only to provide developmental guidelines and reuse but also to describe the interrelations and interactions among the entities in a sensor network and possibly between sensor networks

2.2.2

sensor network application

use case of sensor networks, which provides a set of functions to users to meet defined requirements

EXAMPLE:

Monitoring forests to detect natural fires; monitoring seismic activity; monitoring pollution levels in environment.

2.2.3

sensor network service

set of functionalities offered by individual sensor network elements or the sensor network

EXAMPLE:

Generating an alarm signal if the measurement made at a sensor exceeds or drops out of certain prescribed range; providing average sensor measurements over a given geographic area.

2.2.4

sensor network service provider

agent that offers sensor network services to users

2.3 Communications and networking

2.3.1 Protocol stack

2.3.1.1

application layer

layer that provides means for the application processes to access the OSI environment

[SOURCE: ISO/IEC 2382‑26:1993]

Note 1 to entry: This layer provides means for the application processes to exchange data and it contains the application-oriented protocols by which these processes communicate.

2.3.1.2

data link layer

layer that provides services to transfer data between network layer entities, usually in adjacent nodes

[SOURCE: ISO/IEC 2382‑26:1993]

Note 1 to entry: The data link layer detects and possibly corrects errors that may occur in the physical layer.

2.3.1.3

media access control

data link sublayer that is responsible for transferring data to and from the physical layer

[SOURCE: ISO/IEC 8802‑3:2000]

Note 1 to entry: It provides channel access control mechanisms that make it possible for several sensor nodes to communicate within a sensor network that incorporates a shared medium.

2.3.1.4

network layer

layer that provides for the entities in the transport layer the means for transferring blocks of data, by routing and switching through the network between the open systems in which those entities reside

[SOURCE: ISO/IEC 2382‑26:1993]

Note 1 to entry: The network layer may use intermediate systems.

Note 2 to entry: Network layer intermediate systems are commonly referred to as "routers" and may be used to perform network layer routing of communications between nodes.

2.3.1.5

physical layer

layer that provides the mechanical, electrical, functional, and procedural means to establish, maintain and release physical connections for transfer of bits over a transmission medium

[SOURCE: ISO/IEC 2382‑26:1993]

2.3.1.6

transport layer

layer that provides a reliable end-to-end data transfer service

[SOURCE: ISO/IEC 2382‑26:1993]

Note 1 to entry: Under specific conditions, the transport layer may improve the service provided by the network layer.

2.3.2   Basic functions

2.3.2.1

relaying

process of receiving data from a sensor network element and retransmitting it for the purpose of extending the communication range

2.3.2.2

routing

process of establishing paths, between a source and a destination, over which packets flow

2.4 Data and information processing

2.4.1

information

structured data concerning objects, such as facts, events, things, processes, or ideas, including concepts, that within a certain context has a particular meaning

2.4.2

aggregation

process of combining data from various sources

2.4.3

collaborative information processing

form of information processing in which multiple sensor network elements collaborate, in order to enhance efficiency and improve the quality and reliability of the output

2.4.4

fusion

deriving information by processing data from various sources

Note 1 to entry: Such data may be sensed data, aggregation of sensor data, or other processed data.

2.5 Interfaces

2.5.1

data interface

specification of data type and exchange protocol used on a physical interface

2.5.2

physical interface

mechanical, electrical, electromagnetic and/or optical interface

Note 1 to entry: A physical interface may, for example, be defined between two devices such as a sensor, an actuator, and a sensor network element or between a device and a cable.

2.5.3

sensor interface

set of software and hardware functionalities used to attach sensors to a sensor node, which may be physical interfaces or data interfaces or both

2.6 Security and privacy

2.6.1

authentication

act of verifying the claimed identity of an entity

Note 1 to entry: Entity may include sensor, actuator or sensor network element.

2.6.2

authorization

granting of rights, which includes the granting of access based on access rights

2.6.3

availability

property of being accessible and useable upon demand by an authorized entity

[SOURCE: ISO 7498‑2:1989, definition 3.3.11]

2.6.4

confidentiality

property that information is not made available or disclosed to unauthorized individuals, entities, or processes

[SOURCE: ISO 7498‑2:1989, definition 3.3.16]

2.6.5

data integrity

property that data has not been altered or destroyed in an unauthorized manner

2.6.6

data security

preservation of data to guarantee availability, confidentiality and data integrity

2.6.7

privacy

right of individuals to control or influence what information related to them may be collected and stored and by whom and to whom that information may be disclosed

[SOURCE: ISO 7498‑2:1989, definition 3.3.43]

2.7 Provision of service

2.7.1

device management

procedures to operate and maintain a sensor network element

2.7.2

identification

process of recognizing an entity by using its attributes, identifier, etc.

2.7.3

identifier

character, or string of characters, used to unambiguously identify an entity such as a sensor network element

2.7.4

middleware

software which allows for interaction between two or more different software entities by hiding their structure and complexity from each other

2.7.5

network management

care for operation and maintenance of a sensor network, including the monitoring and controlling of its elements and the configuration of the sensor network, and the allocation of resources across the sensor network

2.7.6

quality of service

collective effect of service performance, which determines the satisfaction of users

Note 1 to entry: The quality of service may be defined at the "user satisfaction" level by a number of metrics that may vary from one sensor network application to another. Quality of service may also be characterized through a number of lower level metrics. For example, when it comes to transmission of information within a sensor network, the appropriate metrics would include packet loss rate and latency, which affect transmission quality.

2.7.7

sensor network integration platform

middleware which integrates any given sensor network into a wider IT system using an abstraction layer, controls the interaction between sensor networks and existing enterprise infrastructures and supports intra-corporate and cross-company integration

2.7.8

service layer

conceptual layer that consists of sets of services provided by sensor networks

2.8 Others

2.8.1

homogeneous sensor network

sensor network in which all nodes are interoperable and functionally identical

2.8.2

heterogeneous sensor network

sensor network in which not all nodes are interoperable or functionally identical

2.8.3

interoperability

ability of diverse sensor networks or sensor nodes to exchange information and to make mutual use of the information that has been exchanged

2.8.4

interworking

functionality to interconnect dissimilar networks in terms of communication technology and/or information manipulation

2.8.5

user

any person, organization, process, device, program or system which uses services provided by others, and may benefit from the operation of a sensor network

2.8.6 и далее ???