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Telecommunications and information exchange between systems — Future network protocols and mechanisms —

Part 3: Networking of everything

Télécommunications et échange d'informations entre systèmes — Futurs protocoles et mécanismes de réseau —

Partie 3: Réseautique universelle

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

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Introduction

ISO/IEC TR 29181 is a series of standards on Future Network (FN). The subject of ISO/IEC TR 29181-9 is Networking of Everything (NoE).

ISO/IEC 21558-3[1)] specifies the architecture of the FN-NoE to provide further advanced NoE services identified in ISO/IEC TR 29181-9.

This document focuses on the FN-NoE protocols and mechanisms, consisting of functional procedures, service interfaces, and protocols, to provide the thing-user centric communication service upon the FN-NoE architecture defined in ISO/IEC 21558-3.

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Telecommunications and information exchange between systems — Future network protocols and mechanisms —

Part 3: Networking of everything

1 Scope

This document specifies:

— functional procedures to provide thing-user social networking and proximity defined networking;

— service access interfaces and protocols to support the FN-NoE functional procedure.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 21558-3:2022, *Telecommunications and information exchange between systems — Future network architecture — Part 3: Networking of everything*

ISO/IEC/TR 29181-9:2017, *Information technology — Future Network — Problem statement and requirements — Part 9: Networking of everything*

3 Terms and definitions

For the purposes of this document, the terms and definitions specified in ISO/IEC 21558-3 and ISO/IEC TR 29181-9 and the following apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
object
intrinsic representation of an entity that is described at an appropriate level of abstraction in terms of its attributes and functions

[SOURCE: ISO/IEC TR 29181-9:2017, 3.12]

3.2
identifier
series of digits, characters and symbols or any other form of data used to identify subscriber(s), user(s), network element(s), function(s), network entity(ies) providing services/applications, or other entities (e.g. physical or logical objects)

[SOURCE: ISO/IEC TR 29181-9:2017, 3.7]

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3.3
context
information that can be used to characterize the environment of a user

[SOURCE: ISO/IEC TR 29181-9:2017, 3.4]

3.4
thing
object (3.1) of the physical world (physical things) or of the information world (virtual thing), which is capable of being identified and integrated into communication networks

Note 1 to entry: Physical things are capable of being sensed, actuated and connected to things such as robots, goods and electrical equipment. Virtual things are capable of being stored, processed and accessed by things such as multimedia content and application software.

[SOURCE: ISO/IEC TR 29181-9:2017, 3.16]

3.5
collaborative work group
group of thing-users that can perform job planning, thing-user recruiting and coordination without human intervention

[SOURCE: ISO/IEC TR 29181-9:2017, 3.2]

3.6
proximity defined network
PDN
network configured among devices in close proximity, using conventional wired/wireless LAN or WAN technologies, which are in not only physically close proximity, but also closely related, or logically close proximity.

Note 1 to entry: PDN is an instantaneous network which is formed during the networking of everything.

[SOURCE: ISO/IEC TR 29181-9:2017, 3.13, modified — Note 1 to entry was added.]

3.7
Future Network for Networking of Everything
FN-NoE
network that is capable of providing *thing-user social networking* (3.12) and *thing-user centric communication* (3.13) service to the thing-users

[SOURCE: ISO/IEC 21558-3:2022, 3.8]

3.8
thing-user
thing that uses the *Future Network for Networking of Everything (FN-NoE)* (**3.7**) network service or the FN-NoE services provided by other things

Note 1 to entry: The thing-user in FN-NoE is defined as a concept corresponding to a human-user. Thing-user has an *NoE terminal* (3.11) function.

[SOURCE: ISO/IEC 21558-3:2022, 3.10, modified — Note 1 to entry was added.]

3.9
everything
equipment that is capable of performing Networking of Everything (NoE)

Note 1 to entry: "Everything" can be regarded as anything which can perform NoE in Future Network (FN). Everything is limited to the NoE related documents if there are no other comments.

[SOURCE: ISO/IEC 21558-3:2022, 3.11, modified — The last sentence of Note 1 to entry was added.]

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3.10
Networking of Everything
NoE
process that is capable of providing *Future Network for Networking of Everything (FN-NoE)* (**3.7**) services

[SOURCE: ISO/IEC 21558-3:2022, 3.12]

3.11
Networking of Everything (NoE) terminal
thing that can perform the process in the network capable of providing *thing-user social networking* (3.12) and *thing-user centric communication* (3.13) service to the thing users

[SOURCE: ISO/IEC 21558-3:2022, 3.13]

3.12
thing-user social network
social network among *thing-users* (3.8) which automatically shares its capabilities, *context* (3.3), communicative motivation, experiences and intentions of collaboration for delivering the intelligent super-realistic service

Note 1 to entry: As the thing-user expands the social network, it may expand its knowledge.

Note 2 to entry: Thing-user social networking service can be a web application that thing-users use to build a social network provided by Networking of Everything (NoE). For web implementations, please see references [2], [3], [4], [5], and [6].

[SOURCE: ISO/IEC 21558-3:2022, 3.14, modified — The last sentence of Note 1 to entry was added.]

3.13
thing-user centric communication
process of conveying intended meanings from one *thing-user* (3.8) to another thing-user or thing-user group through the use of mutually understood language

[SOURCE: ISO/IEC 21558-3:2022, 3.15]

3.14
thing-user centric network
network that allows a *thing-user* (3.8) to discover another thing-user or thing-user group who understands its intention conveyed from the thing-user and supports the thing-user in achieving its mission

[SOURCE: ISO/IEC 21558-3:2022, 3.16]

3.15
Profile
all or some of the following information statements about a *thing-user* (3.8): (1) basic statements including Name, Identity, Address, URL, Account, Contract, Security; (2) motivation statements describing why the thing-user joins the social network; (3) mission statements describing what the thing-user plans to accomplish; and/or (4) capacity statements which describe its predications, knowledge, resources

Note 1 to entry: The statements in the Profile can be represented by semantic web language, e.g. RDF, RDFS or OWL, which can be standardized in W3C.

Note 2 to entry: In this document, semantic web technologies are used for explanation.

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3.16
Networking of Everything (NoE) registry
resource which maintains and manages *thing-user* (3.8) social communities and *clusters* (3.17) by keeping a list of all or some of the following characteristics of social communities and social clusters: (1) types of social networks including category, place, means to connect with others, or a recommendation system linked to trust; (2) coordinator information and status of social networks; (3) physical characteristics, e.g. geographical locations, owner information, type, size; (4) network characteristics, e.g. name, address, URI, capacity including QoS or security

3.17
cluster
one of the social groups of *community* (3.18) based on cultural and geographical relations

Note 1 to entry: Each cluster shall be built on characteristics of category place, communication type, or system type. The cluster is organized and maintained by the cluster coordinator, who the cluster members elect.

3.18
community
one of the social groups of a *thing-user* (3.8) social network to share experiences and collaborate with other thing-users to achieve a specific mission.

Note 1 to entry: The thing-users are autonomous and have equal rights to govern the thing-user social community. A social community can be composed of one or more *thing-user social clusters* (3.17).

Note 2 to entry: The thing-user social community may have multi-tiered communities.

3.19
home thing-user
thing-user (3.8) that initially requests any action for a thing-user social network or a *thing-user centric network* (3.14)

4 Abbreviated terms

dTU-ID	destination Thing-User ID
FN	Future Network
FN-NoE	Future Network for Networking of Everything
ICT	Information and Communication Technology
ID	Identifier
NoE	Networking of Everything
PDN	Proximity Defined Network
SAP	Service Access Point
sTU-ID	source Thing-User ID
TSC	Thing-User Service Control
TSN	Thing-User Social Network
TU	Thing-User
TU-ID	Thing-User ID
TUn	Thing-User n

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