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TELECOMMUNICATION
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SERIES Y: GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS AND NEXT-GENERATION NETWORKS, INTERNET OF THINGS AND SMART CITIES

Internet of things and smart cities and communities – Frameworks, architectures and protocols

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

Broadband, triple-play and advanced multimedia services – Advanced multimedia services and applications

Web of things service architecture

Recommendation ITU-T Y.4414/H.623

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Recommendation ITU-T Y.4414/H.623

Web of things service architecture

Summary

Recommendation ITU-T Y.4414/H.623 defines a web of things (WoT) service architecture that can encompass service discovery, accessibility, sharing and mash-up for IoT devices and services with web technologies. It includes an overview of WoT services, the functional architecture of WoT services and WoT service/resource functions.

The WoT service architecture supports accessibility and reusability across IoT resources, and supports portability across heterogeneous network environments. Therefore, this Recommendation is applicable to seamless and interoperable IoT services with information interaction and exchange over physical IoT devices.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
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Web of things, WoT, WoT service architecture.

* To access the Recommendation, type the URL http://handle.itu.int/ in the address field of your web browser, followed by the Recommendation's unique ID. For example, http://handle.itu.int/11.1002/1000/11830-en.

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Web of things service architecture

1 Scope

The objective of this Recommendation is to define a WoT service architecture. The scope of this Recommendation covers the following:

– overview of the WoT applications

– a functional architecture for the WoT service

– functional entities for the WoT service

2 References

The following ITU-T Recommendations and other references contain provisions, which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T M.3030] Recommendation ITU-T M.3030 (2002), *Telecommunications Markup Language (tML) framework*.

[ITU-T Y.2002] Recommendation ITU-T Y.2002 (2009), *Overview of ubiquitous networking and of its support in NGN*.

[ITU-T Y.2232] Recommendation ITU-T Y.2232 (2008), *NGN convergence service model and scenario using web services*.

[ITU-T Y.4000] Recommendation ITU-T Y.4000/Y.2060 (2012), *Overview of the Internet of things*.

[ITU-T Y.4400] Recommendation ITU-T Y.4400/Y.2063 (2012), Framework of the w*eb of things*.

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 client [b-W3C WACterms]: The role adopted by an application when it is retrieving and/or rendering resources. A program establishes connections for the purpose of sending requests.

3.1.2 device [b-W3C digloss]: An apparatus through which a user can perceive and interact with the Web.

3.1.3 Internet of things (IoT) [ITU-T Y.4000]: A global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on, existing and evolving, interoperable information and communication technologies.

NOTE 1 – Through the exploitation of identification, data capture, processing and communication capabilities, the IoT makes full use of things to offer services to all kinds of applications, whilst ensuring that security and privacy requirements are fulfilled.

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NOTE 2 – In a broad perspective, the IoT can be perceived as a vision with technological and societal implications.

3.1.4 metadata [ITU-T M.3030]: Data that describes other data.

3.1.5 resource [b-IETF RFC 3986]: This specification does not limit the scope of what might be a resource; rather, the term "resource" is used in a general sense for whatever might be identified by a URI. Familiar examples include an electronic document, an image, a source of information with a consistent purpose (e.g., "today's weather report for Los Angeles"), a service (e.g., an HTTP-to-SMS gateway), and a collection of other resources. A resource is not necessarily accessible via the Internet; e.g., human beings, corporations, and bound books in a library can also be resources. Likewise, abstract concepts can be resources, such as the operators and operands of a mathematical equation, the types of a relationship (e.g., "parent" or "employee"), or numeric values (e.g., zero, one, and infinity).

3.1.6 server [b-W3C WACterms]: The role adopted by an application when it is supplying resources.

3.1.7 service provider [ITU-T Y.2232]: An entity that provides services.

3.1.8 SOAP [b-W3C SOAP 1]: The formal set of conventions governing the format and processing rules of a SOAP message. These conventions include the interactions among SOAP nodes generating and accepting SOAP messages for the purpose of exchanging information along a SOAP message path.

3.1.9 SOAP intermediary [b-W3C SOAP 1]: A SOAP intermediary is both a SOAP receiver and a SOAP sender and is targetable from within a SOAP message. It processes the SOAP header blocks targeted at it and acts to forward a SOAP message towards an ultimate SOAP receiver.

3.1.10 the World Wide Web (WWW, or simply web) [b-W3C webarch]: An information space in which the items of interest, referred to as resources, are identified by global identifiers called Uniform Resource Identifiers (URI).

3.1.11 thing [ITU-T Y.4000]: In the Internet of things, object of the physical world (physical things) or of the information world (virtual things), which is capable of being identified and integrated into the communication networks.

3.1.12 URI [b-IETF RFC 3986]: A URI is an identifier consisting of a sequence of characters matching the syntax rule named <URI> in Section 3 of [b-IETF RFC 3986]. It enables uniform identification of resources via a separately defined extensible set of naming schemes (Section 3.1 of [b-IETF RFC 3986]). How that identification is accomplished, assigned, or enabled is delegated to each scheme specification.

3.1.13 web of things [ITU-T Y.4400]: A way of realization of the IoT where (physical and virtual) things are connected and controlled through the World Wide Web.

3.1.14 web resource [b-W3C WACterms]: A resource, identified by a URI.

3.1.15 web services [ITU-T Y.2232]: Web services is a service provided using web services systems.

3.1.16 web services gateway (WSG) [ITU-T Y.2232]: A gateway which handles the web services message between the WSP and WSR.

3.1.17 web services provider (WSP) [ITU-T Y.2232]: A service provider that exposes a capability for use to create web services.

3.1.18 web services registry [ITU-T Y.2232]: An entity that stores web services information (e.g., WSDL).

3.1.19 Web services requester (WSR) [ITU-T Y.2232]: Client software that makes use of the services provided by a WSP.

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