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

Internet of things and smart cities and communities –
Requirements and use cases

Framework of wireless power transmission application service

Recommendation ITU-T Y.4202

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Recommendation ITU-T Y.4202

Framework of wireless power transmission application service

Summary

Recommendation ITU-T Y.4202 defines a framework for wireless power transmission (WPT) application service by describing concept, functional model, requirements, basic service flows and use cases. Wireless power transmission is a technology to transmit electric power wirelessly.

Applications using WPT technology are expanding to mobile and portable devices, home appliances and office equipment, and electric vehicles. In particular, WPT technology is useful in providing electric power to the Internet of things (IoT) devices in constrained environments. The WPT application service is an application service to realize various types of WPT charging for devices capable of receiving electric power wirelessly.

History

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Service framework, service requirements, wireless power transmission, WPT application service.

* 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>.

FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

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Recommendation ITU-T Y.4202

Framework of wireless power transmission application service

1 Scope

This Recommendation defines a framework for wireless power transmission (WPT) application service.

WPT is a technology to transmit electric power wirelessly. WPT can be realized in various ways, and applications using WPT technology are expanding to mobile and portable devices, home appliances and office equipment, and electric vehicles. In particular, WPT technology is useful in providing electric power to the Internet of things (IoT) devices in constrained environments.

The WPT application service is an application service to realize various types of WPT charging for devices (IoT devices in the context of this Recommendation) capable of receiving electric power wirelessly.

The scope of this Recommendation includes the following:

- concept of WPT application service;
- functional model of WPT application service;
- requirements of the WPT application service;
- basic service flows for WPT application service.

Use cases of WPT application service are also provided in Appendix I.

NOTE – Electric hazard related issues are out of scope of this Recommendation.

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 Q.1742] | Recommendation ITU-T Q.1742 (2014), <i>IMT-2000 references to ANSI-41 evolved core network with cdma2000 access network</i> . |
| [ITU-T Y.1271] | Recommendation ITU-T Y.1271 (2014), <i>Framework(s) on network requirements and capabilities to support emergency telecommunications over evolving circuit-switched and packet-switched networks</i> . |
| [ITU-T Y.2233] | Recommendation ITU-T Y.2233 (2010), <i>Requirements and framework allowing accounting and charging capabilities in NGN</i> . |
| [ITU-T Y.4000] | Recommendation ITU-T Y.4000/Y.2060 (2012), <i>Overview of the Internet of things</i> . |

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 authentication [ITU-T Q.1742]: The act of verifying the identity of an entity (e.g., a user, device).

3.1.2 authorization [ITU-T Y.1271]: The act of determining if a particular privilege, such as access to telecommunications resource, can be granted to the presenter of a particular credential.

3.1.3 charging [b-ITU-T Q.1741.1]: A function whereby information related to a chargeable event is formatted and transferred in order to make it possible to determine usage for which the charged party may be billed.

3.1.4 wireless power transmission [b-ITU-R SM.2110-0]: The transmission of power from a power source to an electrical load using the electromagnetic field.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 accounting: The process of collecting and analysing service and resource usage metrics for the purposes of capacity and trend analysis, cost allocation, auditing, billing, etc. Accounting management requires that resource consumption be measured, rated, assigned, and communicated between appropriate business entities.

NOTE – This definition is based on the definition of 'accounting' found in [ITU-T Y.2233].

3.2.2 electric charging: The act of providing electric power to devices.

3.2.3 WPT application service: An application service provided in the wireless power transmission (WPT) charging infrastructure for support of WPT devices and WPT base stations.

3.2.4 WPT base station: A module transmitting electric power to the WPT device in a wireless manner.

3.2.5 WPT charging: The act of providing electric power to devices using WPT technology.

3.2.6 WPT device: An IoT device capable of receiving electric power from a WPT base station in a wireless manner.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

AA	Authentication and Authorization
IoT	Internet of things
RLC	Resistor (R), Inductor (L) and Capacitor (C)
WPT	Wireless Power Transmission

5 Conventions

In this Recommendation:

The keywords "**is required to**" indicate a requirement which must be strictly followed and from which no deviation is permitted, if conformance to this Recommendation is to be claimed.

The keywords "**is recommended**" indicate a requirement which is recommended but which is not absolutely required. Thus, this requirement need not be present to claim conformance.

The keywords "**can optionally**" indicate an optional requirement which is permissible, without implying any sense of being recommended. This term is not intended to imply that the vendor's implementation must provide the option and the feature can be optionally enabled by the network