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Part 20702: Medical devices communication profile for web services

Informatique de santé — Communication entre dispositifs médicaux sur le site des soins —

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IEEE Std 11073™-20702-2016

Health informatics—Point-of-care medical device communication

Part 20702: Medical Devices Communication Profile for Web Services

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Approved 22 September 2016

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Abstract: Within the context of the ISO/IEEE 11073 family of standards for point-of-care (PoC) medical device communication, a communication protocol specification for a distributed system of PoC medical devices and medical IT systems that need to exchange data, or safely control networked PoC medical devices by profiling Web Service specifications, is defined by this standard. Additional Web Service specifications are part of this standard.

Keywords: Devices Profile for Web Services, DPWS, Efficient XML Interchange, EXI, IEEE 11073-20702™, ISO/IEEE 11073, MDC, medical device communication, PoC, point-of-care, safety, Simple Object Access Protocol, SOAP, Streaming Web Services, WS-Discovery

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Introduction

This introduction is not part of IEEE Std 11073-20702-2016, Health informatics—Point-of-care medical device communication—Part 20702: Standard for Medical Devices Communication Profile for Web Services.

ISO/IEEE 11073 standards enable communication between medical devices and external computer systems. They provide automatic and detailed electronic data capture of patient vital signs information and device operational data. The primary goals are to:

— Provide real-time plug-and-play interoperability for patient-connected medical devices

— Facilitate the efficient exchange of vital signs and medical device data, acquired at the point-of-care (POC), in all healthcare environments

This standard defines a discovery, messaging, and event propagation method for a distributed POC medical device communication system. It serves as communication transport layer related to the existing ISO/IEEE 11073 standards series (ISO/IEEE 11073-10101:2004 [B6], ISO/IEEE 11073-10201:2004 [B7], and ISO/IEEE 11073-20101:2004 [B8]).[1] Moreover, a set of protocols is defined that allows transmission of real-time streams (e.g., waveforms) and remote control of a medical device in a safe way. For this purpose, it introduces implementation constraints and extensions on the Devices Profile for Web Services (DPWS) standard (OASIS DPWS V1.1) in order to allow the utilization of DPWS in such an environment.

Furthermore, this standard is intended to be compatible with the Integrating the Healthcare Enterprise (IHE) International's technical framework specifications for using Web Services for achieving interoperability in healthcare [e.g., Web Services Basic Profile 2.0 (WS-I Basic Profile V2.0)], which is used by Information Technology Infrastructure (ITI) Technical Framework Volume 2, Appendix V: Web Services for IHE Transactions, and further referenced for device information exchange in the Patient Care Device (PCD) Technical Framework Volume 2 [B5].

In the IHE Patient Care Device (PCD) domain, Web Services are used to wrap IHE PCD HL7 messages. Beyond that, this standard adds the capability of providing a plug-and-play and publish-subscribe supporting Web Services infrastructure to create a service-oriented architecture in distributed systems of medical devices.

The non-normative name of this standard is "Medical Devices Profile for Web Services" (MDPWS).

[1]The numbers in brackets correspond to those of the bibliography in Annex E.

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Health informatics—Point-of-care medical device communication

Part 20702: Medical Devices Communication Profile for Web Services

1. Overview

1.1 Scope

The scope of this standard is a communication protocol specification for a distributed system of point-of-care (PoC) medical devices and medical IT systems that need to exchange data or safely control networked PoC medical devices by defining a profile for Web Service specifications and defining additional Web Service specifications as part of this standard.

1.2 Purpose

Currently, there is no part of the 11073 standard series that allows plug-and-play-enabled communication of medical devices in an Internet Protocol (IP)-based distributed PoC medical device communication system. Therefore, this standard defines a discovery, messaging, and event propagation method for a distributed PoC medical device communication system based on Web Services. Moreover, it proposes a set of protocols that allow advertisement of STREAMs (e.g., waveforms) as well as provision of remote control in a safe way. For this purpose, the Devices Profile for Web Services (DPWS) is used as a communication foundation and tailored to be utilized in a distributed PoC medical device communication system.

This standard can be used for any diagnostic, therapeutic, or monitoring communication needs where PoC medical devices shall be able to discover communication partners, exchange virtual device descriptions, provide and consume event-driven data, and enable safe remote control.

2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they shall be understood and used, so each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

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3. Definitions, terminology, notational conventions, and normative statements

3.1 Definitions

For the purposes of this document, the following terms and definitions apply. The *IEEE Standards Dictionary Online* should be consulted for terms not defined in this clause.[4]

ASSERTION: A WS-Policy assertion. A policy assertion identifies a behavior that is a requirement or capability of a policy subject. A policy subject is an entity (e.g., an endpoint, message, resource, operation) with which a policy can be associated. (adapted from W3C WS-Policy 1.5 Framework, Section 3.1)

ATTRIBUTE: References the attribute in a normative outline that is currently described.

NOTE—See normative outlines in 3.3.1.[5]

CLIENT: A network endpoint that sends MESSAGEs to and/or receives MESSAGEs from a SERVICE. (OASIS DPWS V1.1)

DEVICE: A distinguished type of SERVICE that hosts other SERVICEs and sends and/or receives one or more specific types of MESSAGEs. (OASIS DPWS V1.1)

ELEMENT: References the element in a normative outline that is currently described.

NOTE—See 3.3.1.

HOSTED SERVICE: A distinguished type of SERVICE that is hosted by another SERVICE. The lifetime of the HOSTED SERVICE is a subset of the lifetime of its host. The HOSTED SERVICE is visible (not encapsulated) and is addressed separately from its host. Each HOSTED SERVICE has exactly one host. The relationship is not transitive. (OASIS DPWS V1.1)

[4]The *IEEE Standards Dictionary Online* is available at: http://dictionary.ieee.org.
[5]Notes in text, tables, and figures of a standard are given for information only and do not contain requirements needed to implement this standard.

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