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Informatique de santé — Interopérabilité des dispositifs —

Partie 20701: Communication entre dispositifs médicaux sur le site des soins — Architecture d'échange orientée services entre dispositifs médicaux et liaison par protocole

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Health informatics—Point-of-care medical device communication

Part 20701: Service-Oriented Medical Device Exchange Architecture and Protocol Binding

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Approved 27 September 2018

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Abstract: Within the context of the ISO/IEEE 11073 family of standards for point-of-care (PoC) medical device communication, an architecture for service-oriented distributed PoC medical devices and medical IT systems is defined. This standard defines a binding of the Participant, Discovery, and Communication Model defined in IEEE Std 11073-10207™ to the profile for transport over Web Services defined in IEEE Std 11073-20702™. Moreover, a binding to Network Time Protocol (NTP) and Differentiated Services (DiffServ) is defined for time synchronization and transport Quality of Service requirements.

Keywords: alert systems, BICEPS, DiffServ, IEEE 11073-20701™, ISO/IEEE 11073, MDPWS, medical device communication, NTP, patient, point-of-care, remote control, service-oriented architecture

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Introduction

This introduction is not part of IEEE Std 11073-20701-2018, Health Informatics—Point-of-care medical device communication—Part 20701: Service-Oriented Medical Device Exchange Architecture and Protocol Binding.

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 medical devices

— Facilitate the efficient exchange of vital signs and medical device data, acquired at the Point-of-Care (PoC), in all health care environments

“Real-time” means that data from multiple devices can be retrieved, time correlated, and displayed or processed in fractions of a second. “Plug-and-play” means that all the clinician has to do is to make the connection—the Participants automatically detect, configure, and communicate without any other human interaction.

“Efficient exchange of medical device data” means that information that is captured at the PoC (e.g., patient vital signs data) can be received, parsed, and interpreted by many different types of applications without unnecessary loss of information. The standards are especially targeted at acute, surgical, and continuing care devices, such as patient monitors, ventilators, infusion pumps, ECG devices, endoscopic camera system, insufflators, endoscopic light sources, dissectors, etc. They comprise a family of standards that can be bound to one another to provide optimized connectivity for devices at the Point-of-Care.

Within the context of the ISO/IEEE 11073 family of standards for PoC medical device communication, this standard defines an architecture for service-oriented distributed PoC medical devices and medical IT systems. It defines a binding of the Participant, Discovery, and Communication Model defined in IEEE Std 11073-10207 to the profile for transport over Web Services defined in IEEE Std 11073-20702. Moreover, a binding to Network Time Protocol (NTP) and Differentiated Services (DiffServ) is defined to satisfy time synchronization and transport Quality of Service requirements.

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Health informatics—Point-of-care medical device communication

Part 20701: Service-Oriented Medical Device Exchange Architecture and Protocol Binding

1. Overview

1.1 Scope

The scope of this standard is a service-oriented medical device architecture and communication protocol specification for 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. It identifies the functional components, their communication relationships as well as the binding of the components and communication relationships to protocol specifications.

1.2 Purpose

This standard defines an architecture for service-oriented distributed PoC medical devices and medical IT systems. It describes a binding of the Participant and Communication model as defined in IEEE Std 11073-10207™ to Medical Devices Communication Profile for Web Services (MDPWS) as defined in IEEE Std 11073-20702™ for transport over Web Services.[1] Moreover, a binding to the Network Time Protocol (NTP) and Differentiated Services (DiffServ) is specified for time synchronization and transport Quality of Service requirements.

2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must 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.

IEEE Std 11073-10207-2017, IEEE Health informatics—Point-of-care medical device communication—Part 10207: Domain Information and Service Model for Service-Oriented Point-of-Care Medical Device Communication. [2, 3]

[1] Information on references can be found in Clause 2.
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IEEE Std 11073-20702-2016, IEEE Health informatics—Point-of-care medical device communication—Part 20702: Medical Devices Communication Profile for Web Services.

IETF RFC 1305, Network Time Protocol (Version 3) Specification, Implementation and Analysis, D. Mills, March 1992. Available at https://tools.ietf.org/html/rfc1305.

IETF RFC 1769, Simple Network Time Protocol (SNTP), D. Mills, March 1995. Available at https://tools.ietf.org/html/rfc1769.

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IETF RFC 5905, Network Time Protocol Version 4: Protocol and Algorithms Specification, D. Mills et al., June 2010. Available at https://tools.ietf.org/html/rfc5905.

ISO/IEEE Std 11073-10101:2004, Health informatics—Point-of-care medical device communication—Part 10101: Nomenclature.[4]

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NOTE 2—Equipment user advisory signals are INFORMATION SIGNALs indicating the presence of conditions that are not ALARM CONDITIONs. An ALERT CONDITION is not an ALARM CONDITION if the priority is neither LOW PRIORITY nor MEDIUM PRIORITY nor HIGH PRIORITY. See IEC 60601-1-8:2006+AMD1:2012 [B3].

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