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IEEE Standard for Ubiquitous Green Community Control Network: Heterogeneous Networks Convergence and Scalability

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Abstract: This standard describes heterogeneous networks convergence and scalability, specifies the requirements of network convergence, extends the system architecture defined in IEEE Std 1888™, IEEE Standard for Ubiquitous Green Community Control Network Protocol, with two new IEEE 1888™ Components, i.e., the reconfigurable resolution server (RRS) and the intelligent application resolver (IAR), and generalizes primitive data type expressions and explicit field-bus data type management in IEEE 1888 systems. This standard enables IEEE 1888 systems to interoperate with heterogeneous access networks efficiently and improves the efficiency, flexibility, scalability and manageability of IEEE 1888 systems.

Keywords: field-bus data type, heterogeneous network convergence, IEEE 1888.2™, intelligent application resolver, reconfigurable resolution server, scalability, primitive data type

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Introduction

This introduction is not part of IEEE Std 1888.2™-2014, IEEE Standard for Ubiquitous Green Community Control Network: Heterogeneous Networks Convergence and Scalability.

IEEE 1888™ has enabled access interoperability with many standard and proprietary protocols for field-bus systems including BACnet™[a], LonWorks®[b], Modbus-based systems, ZigBee®[c] devices, etc. However, IEEE 1888 lacks translation schemes among different application data types, generalized primitive data type expressions, and ID mapping configuration between field-bus and IEEE 1888 systems. That is, there are no efficient and scalable solutions for heterogeneous network convergence in IEEE 1888 systems.

This standard aims to provide the standard criteria for network convergence and scalability that enhances the heterogeneous networks interconnection and improves the efficiency, flexibility, scalability and manageability of IEEE 1888.

This standard extends the system architecture defined in IEEE Std 1888™ [d], IEEE Standard for Ubiquitous Green Community Control Network, with two new Components, i.e., the reconfigurable resolution server (RRS) and the intelligent application resolver (IAR). With the RRS, IEEE 1888 systems can support remote and dynamic distribution of ID mapping configuration and translation rules. The IAR can perform automatic translation among different application data types. In addition, this standard generalizes primitive data type expressions, explicit field-bus data type management, and ID mapping configuration between field-buses and IEEE 1888 systems for heterogeneous networks convergence.

This document is organized as follows:

— Clause 4 identifies the background and the requirements that this standard enables.

— Clause 5 defines the IEEE 1888 system architecture with the RRS and the IAR.

— Clause 6 generalizes the primitive data type expression.

— Clause 7 defines the management rule for importing field-bus data type.

— Clause 8 describes the security consideration.

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[d] Information on references can be found in Clause 2.

Contents

IEEE Standard for Ubiquitous Green Community Control Network: Heterogeneous Networks Convergence and Scalability

1. Overview

1.1 Scope

Based on the protocol defined in IEEE Std 1888™[1], IEEE Standard for Ubiquitous Green Community Control Network Protocol, this standard extends component and data type definitions, message formats, and communication procedures for heterogeneous network convergence and scalability. This standard also describes heterogeneous networks interconnection issues and requirements. Also, this standard specifies system architecture and solutions to improve heterogeneous networks convergence and scalability while offering system robustness and supplying better performance in system operation and management.

1.2 Purpose

This standard describes the standard criteria for network convergence and scalability that enhances the Ubiquitous Green Community Control Network (UGCCNet) heterogeneous networks interconnection. This standard provides enhanced efficiency, flexibility, and scalability to construct a secure, manageable, and compatible system.

[1] Information on references can be found in Clause 2.

2. Normative references

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IEEE Std 1888™, IEEE Standard for Ubiquitous Green Community Control Network Protocol.[2, 3]

IEEE Std 1888.3™, IEEE Standard for Ubiquitous Green Community Control Network Protocol: Security.

XML Schema Part 2: Datatypes Second Edition, P.V. Biron and A. Malhotra, eds., October 2008.[4]

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