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IEEE Standard for Interfaces and Protocols Enabling Distributed Decision Making for Optimized Radio Resource Usage in Heterogeneous Wireless Networks

IEEE Communications Society

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IEEE DySPAN Standards Committee

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IEEE Standard for Interfaces and Protocols Enabling Distributed Decision Making for Optimized Radio Resource Usage in Heterogeneous Wireless Networks

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IEEE DySPAN Standards Committee
of the
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Abstract: Interfaces and service access points defined in IEEE Std 1900.4™ are described in detail, enabling distributed decision making in heterogeneous wireless networks and obtaining context information for this decision making.

Keywords: distributed decision making, dynamic spectrum access, heterogeneous wireless networks, IEEE 1900.4™, interface, protocol, radio resource usage optimization

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ISB Corporation
National Institute of Information and Communications Technology (NICT)
NEC Corporation

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Alcatel-Lucent
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Introduction

This introduction is not part of IEEE Std 1900.4.1-2013, IEEE Standard for Interfaces and Protocols Enabling Distributed Decision Making for Optimized Radio Resource Usage in Heterogeneous Wireless Networks.

Multimode reconfigurable devices are increasingly being adopted within the wireless industry. The choice among various supported air interfaces on a single wireless device is already a reality today, with devices offering, for example, second-, third-, and fourth-generation cellular radio access technologies and IEEE 802® wireless standards. Last but not least, devices and networks with dynamic spectrum access capabilities that allow the use of spectrum resource simultaneously among different systems are emerging and will be part of the radio eco space. Furthermore, there has been an advocated need for these devices and networks being capable of operation in white space frequency bands to improve spectrum usage.

This standard and its baseline, IEEE Std 1900.4™-2009, define an overall system architecture and information exchange between the network and devices that will allow the devices to optimally choose among the available radio resources in heterogeneous wireless access networks. Whereas IEEE Std 1900.4-2009 is limited to the architectural and functional definitions, this standard provides detailed descriptions of interfaces and service access points that will enable distributed decision making in heterogeneous wireless networks and obtaining context information for this decision making. This standard also facilitates innovative, cost-effective, and multi-vendor production of network-side and terminal-side components of an IEEE 1900.4 system and accelerates commercialization of this system to improve capacity and quality of service in heterogeneous wireless networks.

The IEEE 1900 Standards Committee was established in the first quarter of 2005 jointly by the IEEE Communications Society and the IEEE Electromagnetic Compatibility Society. The objective of this effort is to develop supporting standards dealing with new technologies and techniques being developed for next-generation radio and advanced spectrum management. On March 22, 2007, the IEEE Standards Association Standards Board (SASB) approved the reorganization of the IEEE 1900 effort as IEEE Standards Coordinating Committee 41 (IEEE SCC41) on Dynamic Spectrum Access Networks (DySPAN). The IEEE Communications Society and the IEEE Electromagnetic Compatibility Society were sponsoring societies for this effort, as they had been for the IEEE 1900 effort. On December 8, 2010, the IEEE SASB authorized that all activities of IEEE SCC41 be transferred to the IEEE Communication Society and that IEEE SCC41 be disbanded. On June 8, 2012, the IEEE SASB approved the IEEE DySPAN Standards Committee (IEEE DySPAN-SC) as a sponsor under the IEEE Communications Society and that all the IEEE 1900.x projects be transferred to IEEE DySPAN-SC. The IEEE 1900.4 working group was launched in February 2007, originating from the IEEE 1900.B study group, and entitled “Architectural Building Blocks Enabling Network-Device Distributed Decision Making for Optimized Radio Resource Usage in Heterogeneous Wireless Access Networks.”

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IEEE Standard for Interfaces and Protocols Enabling Distributed Decision Making for Optimized Radio Resource Usage in Heterogeneous Wireless Networks

1. Overview

1.1 Scope

This standard provides a detailed description of interfaces and service access points defined in the baseline, IEEE Std 1900.4™, enabling distributed decision making in heterogeneous wireless networks and obtaining context information for this decision making.

1.2 Purpose

This standard facilitates innovative, cost-effective, and multi-vendor production of network side and terminal side components of an IEEE 1900.4™ system and accelerates commercialization of this system to improve capacity and quality of service in heterogeneous wireless networks.