IEEE Standard for Information technology—Telecommunications and information exchange between systems—Local and metropolitan area networks—Specific requirements

Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications

Amendment 6: Wireless Access in Vehicular Environments

IEEE Computer Society

Sponsored by the
LAN/MAN Standards Committee

IEEE
3 Park Avenue
New York, NY 10016-5997, USA

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IEEE Std 802.11p™-2010
(Amendment to IEEE Std 802.11™-2007
as amended by IEEE Std 802.11k™-2008,
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Abstract: This amendment specifies the extensions to IEEE Std 802.11 for wireless local area networks (WLANs) providing wireless communications while in a vehicular environment.
Keywords: 5.9 GHz, wireless access in vehicular environments

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Introduction

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IEEE 802.11™ devices may be used in environments where the physical layer properties are rapidly changing and where very short-duration communications exchanges are required. The purpose of this standard is to provide the minimum set of specifications required to ensure interoperability between wireless devices attempting to communicate in potentially rapidly changing communications environments and in situations where transactions must be completed in time frames much shorter than the minimum possible with infrastructure or ad hoc IEEE 802.11 networks. In particular, time frames that are shorter than the amount of time required to perform standard authentication and association to join a BSS are accommodated in this amendment.

This specification accomplishes the following:

— Describes the functions and services required by stations to operate in a rapidly varying environment and to exchange messages without joining a BSS

— Defines the signaling techniques and interface functions used by stations communicating outside of the context of a BSS that are controlled by the IEEE 802.11 MAC

This amendment to IEEE Std 802.11-2007 is based on extensive testing and analyses of wireless communications in a mobile environment. The results of these efforts are documented in ASTM E2213-03, Standard Specification for Telecommunications and Information Exchange Between Roadside and Vehicle Systems—5.9 GHz Band Wireless Access in Vehicular Environments (WAVE)/Dedicated Short Range Communications (DSRC) Medium Access Control (MAC) and Physical Layer (PHY) Specifications.[a] This amendment to IEEE Std 802.11-2007 is technically compatible with ASTM E2213-03.

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NOTE—The editing instructions contained in this amendment define how to merge the material contained herein into the existing base standard and its amendments to form the comprehensive standard.[1]

The editing instructions are shown in ***bold italic***. Four editing instructions are used: change, delete, insert, and replace. ***Change*** is used to make corrections in existing text or tables. The editing instruction specifies the location of the change and describes what is being changed by using ~~strikethrough~~ (to remove old material) and underscore (to add new material). ***Delete*** removes existing material. ***Insert*** adds new material without disturbing the existing material. Insertions may require renumbering. If so, renumbering instructions are given in the editing instructions. ***Replace*** is used to make changes in figures or equations by removing the existing figure or equation and replacing it with a new one. Editing instructions, change markings, and this NOTE will not be carried over into future editions because the changes will be incorporated into the base standard.

[1]Notes in text, tables, and figures are given for information only and do not contain requirements needed to implement the standard.

1. Overview

1.2 Purpose

Insert a new list item after the first dashed list item:

— Describes the functions and services that allow an IEEE 802.11™-compliant device to communicate directly with another such device outside of an independent or infrastructure network.

2. Normative references

Insert the following reference in alphanumeric order in Clause 2:

ITU-R Recommendation TF.460-4(2002), Standard-frequency and time-signal emissions.

4. Abbreviations and acronyms

Insert the following new abbreviations and acronyms in alphabetical order:

GPS Global Positioning System

UTC Coordinated Universal Time

5. General description

5.2 Components of the IEEE 802.11 architecture

5.2.6 QoS BSS: The QoS network

Change the second paragraph in 5.2.6 as follows:

The enhancements that distinguish QoS STAs from non-QoS STAs and QoS APs from non-QoS APs are collectively termed the *QoS facility.* The quantity of certain, QoS-specific, mechanisms may vary among QoS implementations, as well as between QoS STAs and QoS APs, over ranges specified in subsequent clauses. All service primitives, frame formats, coordination function and frame exchange rules, and management interface functions except for the Block Acknowledgment (Block Ack) function, direct-link setup (DLS), and automatic power-save delivery (APSD) are part of the core QoS facilities. A QoS STA or QoS AP must implement those core QoS facilities necessary for its QoS functions to interoperate with other QoS STAs ~~in the BSS~~. Functions such as the Block Ack, DLS, and APSD are separate from the core QoS facilities; and the presence of these functions is indicated by STAs separately from the core QoS facilities. A comprehensive statement on mandatory and optional functionalities is available in Annex A.

Insert the following new subclause (5.2.10) after the last subclause in 5.2, renumbering as necessary:

5.2.10 STA transmission of data frames outside the context of a BSS

In addition to defining procedures for STA communication within a BSS, this standard also allows a STA that is not a member of a BSS to transmit data frames. Such data frames are defined as being transmitted

