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IEEE Standard for Wireless Access in Vehicular Environments (WAVE)—Networking

IEEE Vehicular Technology Society

Developed by the
Intelligent Transportation Systems Committee

IEEE Std 1609.3™-2020
(Revision of IEEE Std 1609.3-2016)

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IEEE SA Standards Board

Abstract: Services to WAVE devices and systems are provided. Layer 3 and layer 4 of the open system interconnect (OSI) model and the Internet Protocol (IP), User Datagram Protocol (UDP), and Transmission Control Protocol (TCP) elements of the Internet model are represented. Management and data services within WAVE devices are provided.

Keywords: IEEE 1609.3™, Provider Service Identifier (PSID), WAVE Service Advertisement (WSA), WAVE Short Message (WSM), Wireless Access in Vehicular Environments (WAVE)

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Introduction

This introduction is not part of IEEE Std 1609.3™-2020, IEEE Standard for Wireless Access in Vehicular Environments (WAVE)—Networking Services.

A WAVE system is a radio communications system intended to provide seamless, interoperable services to users of a transportation system. These services include Intelligent Transportation System (ITS) services recognized by the Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT) [B1][1] and many others contemplated by the automotive and transportation infrastructure industries around the world. Specifically, the WAVE system provides communications between vehicles and infrastructure, communications among vehicles, and potentially communication among other devices. Networking Services provides services to WAVE devices and systems. Layer 3 and layer 4 of the open systems interconnect (OSI) model and the Internet Protocol (IP), User Datagram Protocol (UDP), and Transmission Control Protocol (TCP) elements of the Internet model are represented. Management and data services within WAVE devices are provided. Network Services is but one component in the overall WAVE architecture, which is described in IEEE Std 1609.0™.

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

Contents

IEEE Standard for Wireless Access in Vehicular Environments (WAVE)—Networking Services

1. Overview

1.1 General

A wireless access in vehicular environments (WAVE) system is a radio communication system intended to provide seamless, interoperable services to users of a transportation system. These services include Intelligent Transportation System (ITS) services recognized by the Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT) and many others contemplated by the automotive and transportation infrastructure industries around the world. Specifically, the WAVE system provides communications between vehicles and infrastructure, and communications among vehicles. WAVE Networking Services provide management services and data delivery services between WAVE devices. Networking Services is but one component in the overall WAVE architecture, which is described in IEEE Std 1609.0™[1].

Aspects of the WAVE architecture specifically related to the use of IEEE Std 802.11™ as the underlying wireless communication technology are incorporated in various places throughout this document. The IEEE Std 802.11–specific aspects are identified and marked as such, and Annex M has been added to include aspects specifically related to the use of LTE-V2X as the underlying wireless communication technology.

1.2 Scope

The scope of this standard is to define services, operating at the network and transport layers, in support of wireless connectivity among vehicles, roadside devices, and Intelligent Transportation Systems (ITS) devices. The scope also includes aspects of the corresponding architecture related to the use of lower layer underlying wireless communication technologies.

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