INTERNATIONAL STANDARD

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Second edition
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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

Technologies de l'information — Télécommunications et échange d'information entre systèmes — Réseaux locaux et métropolitains — Exigences spécifiques

Partie 11: Spécifications pour le contrôle d'accès au support et la couche physique

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IEEE Std 802.11i™-2003 Edition
(Includes IEEE Std 802.11, 1999 Edition;
IEEE Std 802.11a.-1999; IEEE Std 802.11b.-1999;
IEEE Std 802.11b.-1999/Cor 1-2001; and IEEE Std 802.11d.-2001)

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

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IEEE Computer Society

Adopted as an International Standard by the International Organization for Standardization and by the International Electrotechnical Commission

Abstract: The medium access control (MAC) and physical characteristics for wireless local area networks (LANs) are specified in this standard, which is part of a series of standards for local and metropolitan area networks. The medium access control unit in this standard is designed to support physical layer units as they may be adopted dependent on the availability of spectrum. This standard contains five physical layer units: four radio units, operating in the 2400–2500 MHz band and in the bands comprising 5.15–5.25 GHz, 5.25–5.35 GHz, and 5.725–5.825 GHz, and one baseband infrared (IR) unit. One radio unit employs the frequency-hopping spread spectrum (FHSS) technique, two employ the direct sequence spread spectrum (DSSS) technique, and another employs the orthogonal frequency division multiplexing (OFDM) technique.
Keywords: 2 GHz, 5 GHz, ad hoc network, high speed, infrared, international roaming, LAN, local area network, mobility, radio frequency, RF, wireless

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ISO/IEC 8802-11 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems*.

This second edition cancels and replaces the first edition (ISO/IEC 8802-11:1999), which has been technically revised. It also incorporates the amendment ISO/IEC 8802-11:1999/Amd.1:2000.

ISO/IEC 8802 consists of the following parts, under the general title *Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks — Specific requirements*:

— *Part 1: Overview of Local Area Network Standards* [Technical Report]

— *Part 2: Logical link control*

— *Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications*

— *Part 5: Token ring access method and physical layer specifications*

— *Part 6: Distributed Queue Dual Bus (DQDB) access method and physical layer specifications*

— *Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications*

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Introduction

This introduction is not part of IEEE Std 802.11i, 2003 Edition, 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.

IEEE Std 802.11, 2003 Edition

IEEE Std 802.11, 2003 Edition, incorporates IEEE Std 802.11, 1999 Edition; IEEE Std 802.11a-1999; IEEE Std 802.11b-1999; IEEE Std 802.11b-1999/Cor 1-2001; and IEEE Std 802.11d-2001. Minor changes have been made throughout the document.

This standard defines the protocol and compatible interconnection of data communication equipment via the air,. radio or infrared (IR), in a local area network (LAN) using the carrier sense multiple access protocol with collision avoidance (CSMA/CA) medium sharing mechanism. The medium access control (MAC) supports operation under control of an access point (AP) as well as between independent stations. The protocol includes authentication, association, and reassociation services, an optional encryption/decryption procedure,power management to reduce power consumption in mobile stations, and a point coordination function (PCF) for time-bounded transfer of data. The standard includes the definition of the management information base (MIB) using Abstract Syntax Notation 1 (ASN.1) and specifies the MAC protocol in a formal way, using the Specification and Description Language (SDL). Both ASN.1 and SDL source code are distributed with this standard.

The IR implementation of the PHY supports 1 Mbit/s data rate with an optional 2 Mbit/s extension. The radio implementations of the PHY specify frequency-hopping spread spectrum (FHSS) supporting 1 Mbit/s and optional 2 Mbit/s data rates, direct sequence spread spectrum (DSSS) supporting both 1 Mbit/s and 2 Mbit/s data rates, complementary code key (CCK) supporting both 5.5 Mbit/s and 11 Mbit/s data rates, optional packet binary convolutional code (PBCC) supporting both 5.5 Mbit/s and 11 Mbit/s data rates, and orthogonal frequency division multiplexing (OFDM) supporting 6 Mbit/s, 12 Mbit/s, and 24 Mbit/s and optional data rates of 9 Mbit/s, 18 Mbit/s, 36 Mbit/s, and 54 Mbit/s.

This standard contains state-of-the-art material. The area covered by this standard is undergoing evolution. Revisions are anticipated to this standard within the next few years to clarify existing material, to correct possible errors, and to incorporate new related material.

Conformance test methodology

An additional standards series, identified by the number 1802, has been established to identify the conformance test methodology documents for the 802 family of standards. Thus the conformance test documents for 802.3 are numbered 1802.3.

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At the time the draft of IEEE Std 802.11b-1999/Cor 1-2001 was sent to sponsor ballot, the IEEE 802.11 Working Group had the following voting members:

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Al Petrick and **Harry Worstell**, *Vice Chairs*
Tim Godfrey, *Secretary*

Vic Hayes, *Parliamentarian*
Carl F. Andren, *new Chair Task Group b-corrigendum 1*
Victoria M. Poncini, *original Chair Task Group b-corrigendum 1*
Bob O'Hara, *Parliamentarian and Chair Task Group d*
John Fakatselis, *Chair Task Group e* **David Bagby**, *Chair Task Group f*

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