

**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 1:  
Enhancements for High-Efficiency WLAN**

IEEE Computer Society

Developed by the  
LAN/MAN Standards Committee

**IEEE Std 802.11ax™-2021**  
(Amendment to IEEE Std 802.11-2020)

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Approved 9 February 2021  
**IEEE SA Standards Board**

**Abstract:** Modifications to both the IEEE 802.11 physical layer (PHY) and medium access control (MAC) sublayer for high-efficiency operation in frequency bands between 1 GHz and 7.125 GHz are defined in this amendment to IEEE Std 802.11-2020.

**Keywords:** dense deployment, high efficiency, IEEE 802.11™, IEEE 802.11ax™, MAC, medium access control, OFDMA, orthogonal frequency division multiple access, PHY, physical layer, wireless local area network, WLAN

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## Introduction

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This amendment defines modifications to both the IEEE 802.11 physical layer (PHY) and medium access control (MAC) sublayer for high-efficiency operation in frequency bands between 1 GHz and 7.125 GHz.

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**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 1:  
Enhancements for High-Efficiency WLAN**

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

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 ~~striketrough~~ (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 instruction. *Replace* is used to make changes in tables, figures, or equations by removing the existing figure or equation and replacing it with a new one. Editorial 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. Overview**

**1.4 Word usage**

*Change the second paragraph in 1.4 as follows:*

The construction “between  $x$  and  $y$ ”, “ $x$  to  $y$ ” or “ $x$ - $y$ ” represents an inclusive range (i.e., the range includes both values  $x$  and  $y$ ). The construction “B $x$ -B $y$ ” represents bits  $x$  to  $y$ ; it is not the subtraction of bit  $y$  from bit  $x$ .