

# P802.11ay

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**Type of Project:** Amendment to IEEE Standard 802.11-2012

**PAR Request Date:** 06-Feb-2015

**PAR Approval Date:** 26-Mar-2015

**PAR Expiration Date:** 31-Dec-2019

**Status:** PAR for an Amendment to an existing IEEE Standard

**Root Project:** 802.11-2012

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**1.1 Project Number:** P802.11ay

**1.2 Type of Document:** Standard

**1.3 Life Cycle:** Full Use

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**2.1 Title:** 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: Enhanced Throughput for Operation in License-Exempt Bands Above 45 GHz

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**3.1 Working Group:** Wireless LAN Working Group (C/LM/WG802.11)

**Contact Information for Working Group Chair**

**Name:** Adrian Stephens

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**Phone:** +44 1954 204610

**Contact Information for Working Group Vice-Chair**

**Name:** Jon Rosdahl

**Email Address:** [jrosdahl@ieee.org](mailto:jrosdahl@ieee.org)

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**3.2 Sponsoring Society and Committee:** IEEE Computer Society/LAN/MAN Standards Committee (C/LM)

**Contact Information for Sponsor Chair**

**Name:** Paul Nikolich

**Email Address:** [p.nikolich@ieee.org](mailto:p.nikolich@ieee.org)

**Phone:** 857.205.0050

**Contact Information for Standards Representative**

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**4.1 Type of Ballot:** Individual

**4.2 Expected Date of submission of draft to the IEEE-SA for Initial Sponsor Ballot:** 07/2018

**4.3 Projected Completion Date for Submittal to RevCom:** 02/2019

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**5.1 Approximate number of people expected to be actively involved in the development of this project:** 60

**5.2.a. Scope of the complete standard:** The scope of this standard is to define one medium access control (MAC) and several physical layer (PHY) specifications for wireless connectivity for fixed, portable, and moving stations (STAs) within a local area.

**5.2.b. Scope of the project:** This amendment defines standardized modifications to both the IEEE 802.11 physical layers (PHY) and the IEEE 802.11 medium access control layer (MAC) that enables at least one mode of operation capable of supporting a maximum throughput of at least 20 gigabits per second (measured at the MAC data service access point), while maintaining or improving the power efficiency per station.

This amendment defines operations for license-exempt bands above 45 GHz while ensuring backward compatibility and coexistence with legacy directional multi-gigabit stations (defined by the IEEE 802.11ad amendment) operating in the same band.

**5.3 Is the completion of this standard dependent upon the completion of another standard:** No

**5.4 Purpose:** The purpose of this standard is to provide wireless connectivity for fixed, portable, and moving stations within a local area. This standard also offers regulatory bodies a means of standardizing access to one or more frequency bands for the purpose of local area communication.

**5.5 Need for the Project:** Devices based on the IEEE 802.11 standard for the 60 GHz frequency band (11ad amendment) are being developed and deployed in conjunction with IEEE 802.11 devices operating in frequencies below 6 GHz to offer improved user experience and expand the addressable market for wireless LAN. Despite the augmented capacity provided by the addition of IEEE 802.11 directional multi-gigabit devices, wireless LAN usage continues to grow and find new applications demanding additional capacity. As an example, the speed of wired interfaces such as Ethernet, HDMI, USB and DisplayPort can far exceed 10 gigabits per second. This is in addition to other usages such as cellular offload, wireless docking, wireless display and outdoor/indoor wireless back-haul. Therefore, there is a need to substantially increase the achievable throughput of IEEE 802.11 devices and the overall capacity of IEEE 802.11 deployments. The large portion of license-exempt spectrum available above the 45 GHz frequency band offers a significant opportunity to meet the need.

**5.6 Stakeholders for the Standard:** Manufacturers and users of semiconductors, personal computers, enterprise networking devices, consumer electronic devices, home networking equipment, mobile devices, test and measuring equipment providers and cellular operators.

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## Intellectual Property

**6.1.a. Is the Sponsor aware of any copyright permissions needed for this project?:** No

**6.1.b. Is the Sponsor aware of possible registration activity related to this project?:** No

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**7.1 Are there other standards or projects with a similar scope?:** Yes

**If Yes please explain:** There are two standards and three projects as described below. This new project is different from the listed standards and projects in that it is specific for 802.11 WLANs and aims to provide data rates in excess of 20 gigabits per second for point-to-point and point-to-multipoint indoor and outdoor usages for license-exempt bands above 45 GHz.

Sponsor Organization: IEEE 802

Standard Number: IEEE 802.15.3c

Standard Date: 2009-09-30

Standard Title: Part 15.3: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for High Rate Wireless Personal Area Networks (WPANs): Amendment 2: Millimeter-wave based Alternative Physical Layer Extension

Sponsor Organization: ECMA

Standard Number: TC48 60 GHz

Standard Date: 2008-12-31

Standard Title: PHY and MAC layers for 60 GHz wireless networks

Sponsor Organization: IEEE 802

Project Number: IEEE P802.11aj

Project Date: 2016-07-30 (projected)

Project Title: Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications - Amendment: Enhancements for Very High Throughput to support one or more of the Chinese 40-50 GHz and 59-64 GHz frequency bands

Sponsor Organization: IEEE 802

Project Number: IEEE P802.15.3d

Project Date: 2016-05 (projected)

Project Title: Part 15.3: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for High Rate Wireless Personal Area Networks (WPAN): Amendment for a 100Gbps wireless switched point-to-point physical layer

Sponsor Organization: IEEE 802

Project Number: IEEE P802.15.3e

Project Date: 2017-05 (projected)

Project Title: Part 15.3: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for High Rate Wireless Personal Area Networks (WPAN): Amendment for high-rate close proximity point-to-point communications

**and answer the following**

**Sponsor Organization:** IEEE-802 LAN/MAN Standards Committee

**Project/Standard Number:**

**Project/Standard Date:**

**Project/Standard Title:**

**7.2 Joint Development**

**Is it the intent to develop this document jointly with another organization?:** No

**8.1 Additional Explanatory Notes (Item Number and Explanation): 5.2.b:**

- \* This amendment improves the spatial reuse of multiple simultaneous nearby transmissions to increase the aggregated system throughput.
- \* The amendment will be evaluated with a set of typical deployment scenarios representative of the main expected usage models: residential, enterprise, indoor, outdoor, hotspot and outdoor/indoor backhaul.
- \* Power efficiency is intended to measure consumption (Joules/bit) of devices which can reasonably be assumed to be powered by batteries and takes into account average power consumption for a given scenario. Power efficiency of devices compliant with this amendment will be compared against the power efficiency of devices compliant with the IEEE 802.11ad amendment.
- \* IEEE 802.11ad-2012, Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications - Amendment 3: Enhancements for Very High Throughput in the 60 GHz frequency band

7.1

7.1 Are there other standards or projects with a similar scope?:

Yes, there are two standards and two projects as follows.

Sponsor Organization: IEEE 802

Standard Number: IEEE 802.15.3c

Standard Date: 2009-09-30

Standard Title: Part 15.3: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for High Rate Wireless Personal Area Networks (WPANs): Amendment 2: Millimeter-wave based Alternative Physical Layer Extension

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