P802.11az

Submitter Email: jonathan.segev@intel.com
Type of Project: Amendment to IEEE Standard 802.11-2012
PAR Request Date: 21-Jul-2015
PAR Approval Date: 03-Sep-2015
PAR Expiration Date: 31-Dec-2019
Status: PAR for an Amendment to an existing IEEE Standard
Root Project: 802.11-2012

1.1 Project Number: P802.11az
1.2 Type of Document: Standard
1.3 Life Cycle: Full Use

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 - Enhancements for Positioning

3.1 Working Group: Wireless LAN Working Group (C/LM/WG802.11)
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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
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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: 09/2018
4.3 Projected Completion Date for Submittal to RevCom: 10/2019

5.1 Approximate number of people expected to be actively involved in the development of this project: 40
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 modifications to both the IEEE 802.11 medium access control layer (MAC) and physical layers (PHY) of High Throughput (HT), Very High Throughput (VHT), Directional Multi Gigabit (DMG) and PHYs under concurrent development (e.g. High Efficiency WLAN (HEW), Next Generation 60GHz (NG60)) that enables determination of absolute and relative position with better accuracy with respect to the Fine Timing Measurement (FTM) protocol executing on the same PHY-type, while reducing existing wireless medium use and power consumption and is scalable to dense deployments.
This amendment requires backward compatibility and coexistence with legacy devices. Backward compatibility with legacy 802.11 devices implies that devices implementing this amendment shall (a) maintain data communication compatibility and (b) support the Fine Timing Measurement (FTM) protocol.

5.3 Is the completion of this standard dependent upon the completion of another standard: Yes
If yes please explain: The P802.11 HEW and P802.11 NG60 task groups are amending the IEEE Std. 802.11. It is anticipated that the P802.11 NGP, P802.11 HE and P802.11 NG60 amendments will coordinate their drafts in accordance with their expected completion dates.

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: With the introduction of accurate location support to IEEE Std 802.11, a broad set of mass market applications and Use Cases have been enabled.
However, as the technology penetrates the market, user expectations are for positioning services to be made available anytime, any place at increasing level of performance.
According to market research the year over year market till 2018 for 802.11 based positioning technology is expected to grow by roughly 15% for AP to STA usages and 50% for peer to peer usages year over year for the same period [2]. Thus the opportunity arises for 802.11 based systems to extend their location capabilities to new use case scenarios.
Current standardized technology already enables 802.11 based navigation for pedestrians, yet other usages and use cases are in need of additional positioning services:

* A more robust, accurate and precise location such as guidance to a product on a specific shelf [1,5] while retaining the existing infrastructure deployment density.
* A highly scalable indoor positioning system for crowded metro stations and stadiums [3,4,5].
* Non-AP STA to non-AP STA positioning such as support for peer to peer connectivity and decision making [5].

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

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: Sponsor Organization: IEEE 802
Project Number: IEEE P802.15.7r1
Projected Date: 2017-05 (projected)
Project Title: P802.15.7 IEEE Standard for Local and Metropolitan Area Networks--Part 15.7: Short-Range Wireless Optical Communication Using Visible Light.

and answer the following
   Sponsor Organization: IEEE 802
   Project/Standard Number: IEEE P802.15.7r1
   Project/Standard Date: 31-May-2017
   Project/Standard Title: P802.15.7 IEEE Standard for Local and Metropolitan Area Networks--Part 15.7: Short-Range Wireless Optical Communication Using Visible Light.
7.2 Joint Development
   Is it the intent to develop this document jointly with another organization?: No

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8.1 Additional Explanatory Notes (Item Number and Explanation): 5.2.b: P802.11 task group REVmc is standardizing a ranging protocol named Fine Timing Measurement

5.3: IEEE Std. 802.11: 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

5.5: References for Clause 5.5:
[1] "Indoor Location Positioning Technology: Research, Start-ups and Predictions", by Grizzly Analytics Market Research, March 2013.
[2] "Smartphone Indoor Location Technologies", by ABI Research, June 2013
[3] 11-14/1235r0, "Scalable Location", by Brian Hart (Cisco Systems) et al., https://mentor.ieee.org /802.11/dcn/14/11-14-1235-00-0wng-scalable-location.pptx
[4] 11-13/72r1, "Client Positioning using Timing Measurements between Access Points,", by Erik Lindskog (CSR Technology) et al., https://mentor.ieee.org /802.11/dcn/13/11-13-0072-01-000m-client-positioning-using-timing-measurements-between-access-points.pptx

[5] 11-14/1464r2, "Next Generation Positioning Overview and Challenges", by Jonathan Segev (Intel) et al., https://mentor.ieee.org/802.11/dcn/14/11-14-1464-02-0wng-ng-positioning-overview-and-chalanges.pptx

7.1: P802.15.7 and P802.11 are different network technologies with different physical layers that both need positioning specifications specific to their network technology.