IEEE P802.11
Wireless LANs

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| Discussion of comments submitted during the SENS CSD WG ballot |
| Date: 2020-07-10 |
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Abstract

A discussion of each comment submitted during the WG11 electronic ballot for the SENS CSD, conducted from March 30th, 2020 to April 14th, 2020, is presented. Changes to the CSD are recommended when deemed appropriate.

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| Comment 1 | If there are already numerous WLAN products, what is the purpose of this project? |
| Comment 2 | If many of the current players are vendors for WLAN sensing, then what is the purpose of this project? |

**Discussion**: While there are WLAN sensing products in the market, as discussed in 1.2.4, as well as in various contributions made to WNG SC, SENS TIG and SENS SG, a WLAN sensing amendment would enhance applications in the area by means of “reducing sensing overhead, increasing reliability of sensing periodicity, control and/or indication of link adaptations that affect sensing accuracy, improving interoperability and improving sensing privacy, etc.”

**Recommendation**: No change.

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| Comment 3 | Inconsistent "YES" |

**Recommendation:** Substitute the “YES” given as answer to question (a) in 1.2.2 with “Yes”.

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| Comment 4 | IEEE P802.11 is not known as REVmd. |

**Recommendation:** Modify the second line of the second paragraph of 1.2.3 as follows:

“estimation capabilities offered by IEEE Std 802.11-2016 ~~IEEE P802.11 (known as REVmd)~~ by defining modifications”

(Note: The sentence referred to by the commenter will be deleted as a result of modifications made to address comment 5.)

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| Comment 5 | The cited paragraph is one single sentence and mentions "enhancing WLAN sensing operation" both at the beginning and the end of this sentence. |

**Recommendation:** Modify the second paragraph of 1.2.3 as follows:

“This amendment ~~will focus on enhancing WLAN sensing operation beyond the channel estimation capabilities offered by IEEE P802.11 (known as REVmd) by defining modifications~~ defines modifications to the medium access control layer (MAC); the Directional Multi-Gigabit (DMG) and under development Next Generation 60 GHz (NG60) PHYs; and the PHY service interface of High Throughput (HT), Very High Throughput (VHT), High Efficiency WLAN (HEW) and Extremely High Throughput (EHT) PHYs that enhance Wireless Local Area Network (WLAN) sensing (SENS) operation in license-exempt frequency bands between 1 GHz and 7.125 GHz and above 45 GHz.**”**

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| Comment 6 | Acroyms should be defined when they first occur, for example WLAN. |

**Recommendation:** Modify the third line of 1.2.1.(a) as follows:

“Status of Wi-Fi market above can pave a broad way for Wireless Local Area Network (WLAN) sensing applications since the”

Modify the second paragraph of 1.2.3 as follows:

“This amendment will focus on enhancing WLAN sensing operation beyond the channel estimation capabilities offered by IEEE P802.11 (known as REVmd) by defining modifications to the medium access control layer (MAC); the Directional Multi-Gigabit (DMG) and ~~under development Next Generation 60 GHz (NG60)~~ enhanced DMG (EDMG) physical layer (PHY~~s~~) specifications; and the PHY service interface of High Throughput (HT), Very High Throughput (VHT), High Efficiency ~~WLAN~~ (HE~~W~~) and Extremely High Throughput (EHT) PHYs that enhance ~~Wireless Local Area Network (~~WLAN~~)~~ sensing ~~(SENS)~~ operation in license-exempt frequency bands between 1 GHz and 7.125 GHz and above 45 GHz.**”**

Modify the first sentence of the second paragraph of 1.2.4.(a) as follows:

“The IEEE 802.11 Wireless Next Generation (WNG) Standing Committee (SC) and ~~SENS~~ WLAN sensing Topic Interest Group (TIG)/Study Group (SG) have ~~has~~ reviewed many presentations indicating that the…”

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| Comment 7 | On page 4, section 1.2.2, "The sensing enhancements also enables an interface" should be "The sensing enhancements also enable an interface" |
| Comment 10 | "The sensing enhancements also enables" should be "enable." Replace "enables" by "enable." |

**Recommendation:** Incorporate the suggested change. Modify the sixth line of the third paragraph of 1.2.3 as follows:

“The sensing enhancements also enable~~s~~ an interface for applications above the MAC to request”

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| Comment 8 | "Sensing" is regulatory word, need to use another word. Change from "sensing" to "measurement" in the document. |

**Discussion:** “WLAN sensing” is a term already commonly used in the industry to refer to the set of technologies and applications to be addressed by the amendment. It is a distinctive term not yet used in other forums, including regulatory ones. The word “measurement” does not appropriately substitute “sensing” in most places of the PAR.

**Recommendation:** When appropriate, replace “sensing” with “WLAN sensing” throughout the document.

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| Comment 9 | No definition for the terms: "WLAN sensing". Define the "WLAN sensing" clearly. |
| Comment 13 | What is "sensing" in What is "sensing" in the context of this document. Sensing not defined nor explained. Hvae no idea of the scope or amount of work proposed. Does this involve vision or taste? |

**Recommendation:** “WLAN sensing” is now defined in 8.1:

“WLAN sensing is the use of PHY and MAC features of IEEE 802.11 stations to obtain channel measurements that characterize the environment in which the stations operate. Measurements obtained with WLAN sensing are used to enable applications such as presence detection and gesture classification, among others. The specification of such applications is beyond the scope of the project.”

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| Comment 11 | Besides the HT, VHT, HEW, EHT also the NGV PHY should be considered for WLAN sensing. Add "Next Generation V2X (NGV)" to the list of PHYs. |

**Discussion:** WLAN sensing has been discussed in various 802.11 groups (WNG SC, SENS TIG, SENS SG) since July 2019. During this time, no presentations were made on the use of NGV PHY for WLAN sensing. Usage models, feasibility, and standards gaps to support NGV-based WLAN sensing are unclear.

**Recommendation:** No change.

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| Comment 12 | There appears to have been no account under "operational costs" taken to economic risks or opportunities with security or privacy implications of this technology. |

**Discussion:** Unfortunately, we are unable at this point to provide a cost analysis of security and privacy implications of the technology.

**Recommendation:** No change.