

Re: Consultation “Technical conditions necessary for advancement of low-power wireless systems”, “Technical conditions for introduction of broadband wireless LAN” and “Technical Conditions for Advanced Use of Wireless LAN Systems”

Dear Telecommunications Bureau,

IEEE 802 LAN/MAN Standards Committee (LMSC) thanks Japan’s Ministry of Internal Affairs and Communications (MIC) for issuing the consultation that call for comments on “Technical conditions necessary for advancement of low-power wireless systems”, “Technical conditions for introduction of broadband wireless LAN”, and “Technical Conditions for Advanced Use of Wireless LAN Systems” and for the opportunity to provide feedback.

IEEE 802 LMSC is a leading consensus-based industry standards body, producing standards for wireless networking devices, including wireless local area networks (“WLANs”), wireless specialty networks (“WSNs”), wireless metropolitan area networks (“Wireless MANs”), and wireless regional area networks (“WRANs”). We also produce standards for wired Ethernet networks, and technologies produced by implementers of our standards are critical for all networked applications today.

IEEE 802 LMSC is a committee of the IEEE Standards Association and Technical Activities, two of the Major Organizational Units of the Institute of Electrical and Electronics Engineers (IEEE). IEEE has about 400,000 members in over 160 countries. IEEE’s core purpose is to foster technological innovation and excellence for the benefit of humanity. In submitting this document, IEEE 802 LMSC acknowledges and respects that other components of IEEE Organizational Units may have perspectives that differ from, or compete with, those of IEEE 802 LMSC. Therefore, this submission should not be construed as representing the views of IEEE as a whole¹.

IEEE 802 LMSC follows Japan’s regulatory activities regarding radio local area network (RLAN) and supports MIC proceedings on enabling Standard Power (SP) using automatic frequency control (AFC) for spectrum sharing with fixed communication systems operated in 5925 MHz to 7125 MHz and authorizing 6425 MHz to 7125 MHz for very low power (VLP) and low power indoor (LPI) modes of operation. We hope that the new regulation will be enacted in a timely manner.

Please find below the IEEE 802 LMSC’s specific comments on this consultation focusing on the aspect of the consultation related to the 6 GHz band (i.e., 5925 MHz to 7125 MHz).

IEEE 802.11be and Wi-Fi 7

IEEE 802 LMSC applauds MIC’s adoption of IEEE 802.11be into its technical conditions for advance use of wireless LAN in Japan. Wi-Fi 7 technologies are developed based on the IEEE P802.11be amendment [1], which is the focus of the IEEE 802 LMSC’s response.

The new generation of IEEE 802.11 technologies, currently under development in the IEEE P802.11be amendment, will continue to improve performance and enhance spectrum coexistence

¹ This document solely represents the views of IEEE 802 LMSC and does not necessarily represent a position of either the IEEE or the IEEE Standards Association.

capacities. To achieve the targeted performance improvements, and as it was recognized in the consultation, IEEE P802.11be introduces advanced features including channel bandwidths of up to 320 MHz, multiple resource units to a single station, multi-link operation, enhanced quality of service (QoS), improved Target Wake Time (for improved battery life for IoT or other applications), and improved punctured transmission/subchannels to accommodate coexistence with incumbents more effectively and efficiently. Please note that the P802.11be amendment currently supports carrier frequency operation between 1000 MHz and 7125 MHz with extension to 7250 MHz under consideration.

Considering 320 MHz channel bandwidth size as one of the key features in the IEEE P802.11be amendment, we would like to use this opportunity and highlight the importance of availability of multiple 320 MHz channels to support scaling of IEEE 802.11be based deployments in environments with multiple simultaneous sessions of high throughput low latency applications such as AR/VR in education or health industries [2] [3]. This highlights importance of MIC extension of 6 GHz band operation and the opening of 6425 MHz to 7125 MHz for SP, LPI, and VLP modes of operation.

Client-to-Client Communication under LPI

IEEE 802 LMSC appreciates MIC leadership in authorizing Client to Client (C2C) communication under the LPI mode of operation. With ever-increasing diversity of device types and form factors, based on the IEEE 802.11 standards, peer-to-peer communication is both appropriate and efficient for a considerable portion of communication links, but also critical to enabling different Wi-Fi industry segments and business models.

IEEE 802 LMSC supports MIC's proposed technical conditions for C2C operation based on the following elements:

1. Authorize C2C operation using an LPI enabling signal of -82 dBm/20 MHz (i.e., -95 dBm/MHz) or higher; and
2. Consider a recheck interval of 4 seconds, on the strength of enabling signal, for portable scenarios when the client device is moving; and
3. Allow client devices being enabled by different access points (APs) to effectively support multi-AP deployments such as enterprise; and
4. Allow C2C links to use different LPI channels and not restrict the C2C communication to the enabling AP operational channel.

IEEE 802 LMSC would like to state that regulatory support for C2C operation in the 6 GHz band is already provisioned in the IEEE 802.11ax [4] and Draft P802.11REVme [5].

Standard Power (SP) in the 6GHz Band

IEEE 802 LMSC understands that MIC is actively working on proceedings and regulations for authorizing SP operation in the 6 GHz band. We also recognize that the incumbent scenarios in Japan are unique and special, and that as a result MIC is currently considering SP operation, under supervision of AFC System, in the two sub-bands, namely 5925 MHz to 6425 MHz and 6570 MHz to 6870 MHz, to accommodate presence of Electronic News Gathering (ENG) incumbent operation in the band. As AFC system certification and deployment in the United States of America is making significant progress, we believe that the timing of authorization and enablement of AFC in Japan is very well timed. IEEE 802 LMSC respectfully request that MIC complete the work and authorization of SP mode in the 6 GHz band in a timely manner.

Conclusion

IEEE 802 LMSC thanks MIC for the opportunity to provide this submission. IEEE 802 LMSC supports MIC initiative to enable IEEE 802.11be including the 320 MHz channel bandwidth sizes and Client-to-Client communication. We respectfully request MIC to take into account our comments listed in this response.

Respectfully submitted,

By: /ss/.

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References:

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- [2] M. Mehrnoush, C. Hu and C. Aldana, "AR/VR Spectrum Requirement for Wi-Fi 6E and Beyond," in IEEE Access, vol. 10, pp. 133016-133026, 2022, doi: 10.1109/ACCESS.2022.3231229.
- [3] D. Akhmetov, R. Arefi, H. Yaghoobi, C. Cordeiro and D. Cavalcanti, "6 GHz Spectrum Needs for Wi-Fi 7," in IEEE Communications Standards Magazine, vol. 6, no. 1, pp. 5-7, March 2022, doi: 10.1109/MCOMSTD.2022.9762843.
- [4] "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," in *IEEE Std 802.11ax-2021 (Amendment to IEEE Std 802.11-2020)*, vol., no., pp.1-767, 19 May 2021, doi: 10.1109/IEEESTD.2021.9442429.
- [5] "IEEE P802.11-REVme™/D3.1, Draft 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, July 2023.