

Re: Consultation on RSS-248, Issue 3 “Radio Local Area Network (RLAN) Devices Operating in the 5925-7125 MHz Band”

Dear Regulatory Standards Directorate,

IEEE 802 LAN/MAN Standards Committee (IEEE 802 LMSC) thanks the Radio Advisory Board of Canada (RABC) for providing an opportunity to comment on the Innovation, Science and Economic Development (ISED)’s consultation on RSS-248, Issue 3 “Radio Local Area Network (RLAN) Devices Operating in the 5925-7125 MHz Band”.

IEEE 802 LMSC is a leading consensus-based open standards development committee for networking standards that are used by industry globally. It produces standards for networking devices, including wired and wireless local area networks (“LANs” and “WLANs”), wireless specialty networks (“WSNs”), wireless metropolitan area networks (“Wireless MANs”), and wireless regional area networks (“WRANs”). Technologies produced by implementers of our standards are a critical element for all networked applications today.

IEEE 802 LMSC is a committee of the IEEE Standards Association and of Technical Activities, two of the Major Organizational Units of the IEEE. IEEE has about 400,000 members in over 160 countries and its core purpose is to foster technological innovation and excellence for the benefit of humanity. IEEE is also a major accredited standards development organization whose standards are recognized worldwide. 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.

Please find below the responses of IEEE 802 LMSC to this consultation.

Supporting Peer to Peer Communication through Enablement of VLP

IEEE 802 LMSC recognizes and applauds ISED to propose authorizing very low power (VLP) operation over the entire 6 GHz band (5925 MHz to 7125 MHz). This decision enables critical growing applications relying on Peer to Peer (P2P) networks and better accommodates sharing of the frequency band and co-existence amongst various unlicensed technologies including technologies based on the family of IEEE 802 standards.

P2P communications offer a means for spectral and power efficient operation that may be otherwise infeasible or inefficient, particularly for real time applications (RTA) such as real time gaming, cloud gaming, real time video, robotics and automation. These applications typically have stringent latency, throughput, and determinism requirements on the same or varying traffic channels².

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 or the IEEE Technical Activities.

² See IEEE 802.11 Real Time Application Topic Interest Group Report, <https://mentor.ieee.org/802.11/dcn/18/11-18-2009-06-0rta-rta-report-draft.docx> [accessed: 26 August 2024].

Improving the Regulatory Framework for 6 GHz P2P Communications

While IEEE 802 LMSC believes that authorizing the VLP operation over the entire 6 GHz band is an exceptional step, P2P communications in the 6 GHz band can only be fully enabled by also improving the existing regulatory framework. In particular, IEEE 802 LMSC kindly requests ISED to consider increasing the maximum e.i.r.p. spectral density from -5 dBm/MHz to 1 dBm/MHz.

This change incrementally increases performance of the VLP operation in 20 MHz and 40 MHz channel bandwidths and enables that the maximum transmit power of VLP devices using the 20 MHz and 40 MHz channel bandwidths to match the maximum transmit power of the devices using 80 MHz, 160 MHz, and 320 MHz channel bandwidths (i.e., a maximum e.i.r.p of 14 dBm³). In addition, this change harmonizes the VLP transmit power in Canada with that in Europe⁴, countries following the Electronic Communications Committee (ECC) Decision (20)01 and, potentially the United States of America, as consideration of improvements for VLP are part of the Federal Communications Commission (FCC)'s second further notice of proposed rulemaking on 6 GHz⁵. Thus, this change would significantly contribute to global harmonization of VLP devices.

An additional, significant improvement in P2P regulation is to authorize Client to Client (C2C) communications under low power indoor (LPI) operation, where most applications are using/can reuse the existing LPI co-existence framework. Enabling LPI C2C allows client devices to directly communicate with each other using existing regulatory requirements, i.e., a maximum e.i.r.p of 24 dBm and a maximum e.i.r.p. spectral density of -1 dBm/MHz⁶. As a result, P2P communications are enabled and can scale without any additional risk of harmful interference to incumbents services while maximally reusing the LPI mode regulatory framework.

In LPI C2C, P2P communication range performance can be improved by extending the range from a few meters (supported in VLP), to a range that can support a wider set of latency sensitive applications and use cases which require gigabit-per-second throughput in indoor spaces. Unlike the improvement in VLP, the improvement from C2C would be on all channel bandwidths, including wider channel bandwidths of 80 MHz, 160 MHz, and 320 MHz that are typically used to enable innovative P2P applications.

Direct communication of LPI client devices is already authorized by the ECC and Ofcom. Technical conditions are endorsed by the Ministry of Internal Affairs and Communications in Japan⁷ and under consideration by the FCC in United States of Americas.

³ See item b, Section 4.5.6, of the consultation.

⁴ See Annex 1.2, ECC Decision (20)01 "On the harmonised use of the frequency band 5945-6425 MHz for Wireless Access Systems including Radio Local Area Networks (WAS/RLAN)," approved 20 November 2020, <https://docdb.cept.org/download/1447> [accessed: 19 August 2024].

⁵ See paragraphs 105 to 108, Second Report and Order, Second Further Note of Proposed Rulemaking, and Memorandum Opinion and Order on Remand, Federal Communications Commission, United States of America, 1 November 2023, <https://docs.fcc.gov/public/attachments/FCC-23-86A1.pdf> [accessed: 26 August 2024].

⁶ See Section 4.5.3 of the consultation.

⁷ See Ministry of Internal Affairs and Communications: Technical Conditions for the Introduction of Broadband Wireless LAN in 5925-6425 MHz Band, 12 September 2023, https://www.soumu.go.jp/main_content/000901042.pdf [accessed: 26 August 2024].

Introducing Simultaneous Composite Access Point Definition

IEEE 802 LMSC proposes to include the definition of a device class that is recognized by ISED however not yet utilized, namely indoor standard power access point (AP). An appropriate definition of this device class can be leveraged from IEEE 802.11REVme draft 7.0⁸ which specifies RegInfo value of 8 and is described as follows:

“Indoor standard power AP is an AP whose operation requires control from an external system such as an AFC system and also operates under regulatory rules requiring indoor operation, and is subject to additional regulatory requirements intended to prohibit outdoor operation.”

IEEE 802 LMSC also proposes to highlight a new operational mode, namely simultaneous composite AP, with appropriate testing being developed through the Wi-Fi Alliance. The operational mode is in alignment with current RSS-248 guidelines and compliant with regulatory requirements. We propose to include the following definition for this new operational mode:

“Simultaneous Composite AP is a standard power AP used indoors which is certified as both an LPI AP and an SP AP while it enables LPI-only, Subordinate, SP-only, and Dual clients to operate under its control.”

Conclusion

IEEE 802 LMSC thanks the RABC for the opportunity to provide this submission and kindly requests ISED to consider increasing the maximum e.i.r.p. spectral density from -5 dBm/MHz to 1 dBm/MHz as described in Section 4.5.6 of the consultation, enabling C2C communication under LPI operation, and consider the proposed definitions of indoor standard power AP and simultaneous composite AP.

Respectfully submitted

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⁸ See Annex E.2.7 of “IEEE Draft Standard for Information Technology -- Telecommunications and Information Exchange Between Systems Local and Metropolitan Area Networks -- Specific Requirements - Part 11: Wireless Local Area Network (LAN) Medium Access Control (MAC) and Physical Layer (PHY) Specifications,” in IEEE P802.11-REVme/D7.0, August 2024 , vol., no., pp.1-6213, 30 July 2024.