IEEE P802.18
Radio Regulatory Technical Advisory Group (RR-TAG)

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| Proposed response to Qatar CRA’s consultation on IoT and M2M positon paper |
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This document drafts a proposed response to Qatar CRA’s consultation on “Public Consultation - Position Paper on IoT and M2M in the State of Qatar”

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Electronic filing September 26, 2024

Re: Public Consultation - Position Paper on IoT and M2M in the State of Qatar

Dear President,

IEEE 802 LAN/MAN Standards Committee (LMSC) thanks Communications Regulatory Authority (CRA) for providing an opportunity to comment on the public consultation - Position Paper on IoT and M2M in the State of Qatar.

IEEE 802 LAN/MAN Standards Committee (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 whole[[1]](#footnote-1).

IEEE 802 LMSC commends CRA for developing a position paper that is strategically important to support the growth of the ICT sector in the state of Qatar. Please find below the responses of IEEE 802 LMSC to Question 6 of this consultation.

**Question 6: Please provide your feedback and suggestions for CRA for the potential adjustments to the spectrum plan to accommodate increased IoT use cases and the promotion of IPv6 adoption for IoT services.**

***IEEE 802.11ah-based Wi-Fi HaLow and IEEE 802.15.4-based UWB and Wi-SUN should be considered as short range technologies for various IoT and M2M applications***

IEEE Std 802.11ah-2016[[2]](#footnote-2), known as Wi-Fi HaLow in the marketplace[[3]](#footnote-3), was an amendment to the draft IEEE 802.11-2024 standard[[4]](#footnote-4) that specifies mechanisms for the operation of Wi-Fi in the license exempt sub 1 GHz bands. It was developed with sensor and IoT networks and applications, which covers many use cases of particular relevance to Qatar as shown in Figure 4 of the position paper.

IEEE Std 802.11ah-2016 is designed for long range, low power sensor applications. It excels in long range coverage of over 1 km (subject to the maximum allowed transmit power) and allows excellent penetration through walls and obstacles. The standard supports a wide range of OFDM data rates from 150 Kbps to 43.3 Mbps[[5]](#footnote-5) that allow support for sensors and new applications that may combine video applications with sensors. It also introduced many features to increase energy efficiency and optimize power consumption per device. Of particular note are the mechanisms for reducing overhead and relaxing timing for energy limited clients that may operate from a coin cell, and the introduction of Target Wake Time (TWT) that allows long sleeping devices to negotiate a time for the devices to be active.

The IEEE 802.15.4 standard has excellent support for IoT devices with low to extremely low energy consumption. IEEE Std 802.15.4z-2020[[6]](#footnote-6) use the 6 GHz to 8 GHz bands for precision ranging applications, with Ultra-Wideband (UWB) technology operation finding adoption for numerous short-range sensing and ranging applications. These technologies are widely deployed in mobile phones and accessories for high integrity distance and direction measurement purposes and will be used in car keys and other very low power consumption IoT and M2M use cases. With the constraint of -41.3 dBm/1 MHz power spectral density, or in other terms, 37 nJ/ms, such solutions provide significant energy saving compared to approaches that rely on larger infrastructure.

In addition, IEEE Std 802.15.4-2020 Smart Utility Networks (SUN)[[7]](#footnote-7) specifies physical layer radio and medium access control mechanisms for operation in sub 1 GHz license exempt frequency bands from 169 MHz to 928 MHz. The technology was initially developed for SUN and other large scale IoT networks, such as smart city networks. Devices using IEEE Std 802.15.4-2020 SUN are extensively deployed as Wi-SUN home area network (HAN) and Wi-SUN field area network (FAN) in a range of applications not only for smart utilities and smart cities[[8]](#footnote-8),[[9]](#footnote-9) but also for smart agriculture and healthcare[[10]](#footnote-10).

IEEE 802 LMSC respectively requests CRA to update Section 2.2 of the position paper to

* Take into account the fact that Wi-Fi operates not only at 2.4 GHz, 5 GHz, and 6 GHz frequency band, but also sub 1-GHz band.
* Introduce IEEE 802.15.4-based UWB and SUN as additional radio-based technologies that provide low-power and short range communications for various IoT and M2M applications that are of particular relevance to Qatar.

**Conclusion**

IEEE 802 LMSC thanks CRA for the opportunity to provide this submission and kindly requests to consider our response by including IEEE 802.11ah-based Wi-Fi HaLow and IEEE 802.15.4-based UWB and Wi-SUN into the position paper.

Respectfully submitted

By: /ss/.

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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. [↑](#footnote-ref-1)
2. 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 2: Sub 1 GHz License Exempt Operation, IEEE Std 802.11ah-2016 (Amendment to IEEE Std 802.11-2016, as amended by IEEE Std 802.11ai-2016), vol., no., pp.1-594, 5 May 2017, doi: 10.1109/IEEESTD.2017.7920364. [↑](#footnote-ref-2)
3. Wi-Fi Alliance: Wi-Fi CERTIFIED HaLow, <https://www.wi-fi.org/discover-wi-fi/wi-fi-certified-halow> [accessed: 8 September 2024] [↑](#footnote-ref-3)
4. See clauses 10.45 to 10.62, clause 23, and Annex L 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. [↑](#footnote-ref-4)
5. For a single stream 8 MHz capable IEEE 802.11ah device [↑](#footnote-ref-5)
6. “IEEE Standard for Low-Rate Wireless Networks--Amendment 1: Enhanced Ultra Wideband (UWB) Physical Layers (PHYs) and Associated Ranging Techniques,” in IEEE Std 802.15.4z-2020 (Amendment to IEEE Std 802.15.4-2020), vol., no., pp.1-174, 25 Aug. 2020, doi: 10.1109/IEEESTD.2020.9179124. [↑](#footnote-ref-6)
7. “IEEE Standard for Low-Rate Wireless Networks,” IEEE Std 802.15.4-2020 (Revision of IEEE Std 802.15.4-2015), vol., no., pp.1-800, 23 July 2020, doi: 10.1109/IEEESTD.2020.9144691. [↑](#footnote-ref-7)
8. Wi-SUN Alliance, <https://wi-sun.org> [accessed: 8 September 2024] [↑](#footnote-ref-8)
9. National Institute of Information and Communications Technology: World’s First Application of Wi-SUN Radio Sensor Network to Fishery Industry, MOZUKU Seaweed Aquaculture, 25 December 2015, <https://www.nict.go.jp/en/press/2015/12/25-1.html> [accessed: 8 September 2024] [↑](#footnote-ref-9)
10. Japan Science: Successful multi-stage relay demonstration experiment performed at Kyoto University medical institution, 26 July 2021, <https://sj.jst.go.jp/news/202107/n0726-03k.html> [accessed: 8 September 2024] [↑](#footnote-ref-10)