Class License for Use of RLAN Devices over 5925-7125 MHz Band

SUMMARY OF COMMENTS AND RESPONSES OF CRA

Background

On 20th March 2020, CRA published Class License for Use of RLAN Devices over 5925-7125 MHz Band– A Consultation Document, that would set the terms and conditions and technical parameters for the deployment of WiFi 6 devices across Qatar.

The Communications Regulatory Authority "CRA" is the responsible authority for establishing an effective approval regime for telecommunications equipment in the State of Qatar in accordance with Decree-Law No. (34) of 2006 on the promulgation of the Telecommunications Law as amended by Law No. (17) of 2017, the Executive By-Law for the Telecommunications Law.

Class License for Use of RLAN Devices over 5925-7125 MHz Band consultation document set out CRA's overview to provide an opportunity for interested parties/stakeholders to present their views and comments on the document. This final version of the document will be updated and published after the approval from competent authorities after incorporating the comments received from interested parties/stakeholders.

Class License for Use of RLAN Devices over 5925-7125 MHz Band consultation document is available on CRA's website at following link:

https://www.cra.gov.qa/en/document/public-consultation-on-class-license-for-use-of-rlan-devices-over-5925-7125-mhz-band-wi-fi-6

This document provides the summary of all the responses submitted by the interested parties/stakeholders and provides CRA's response on them accordingly. The views, comments, or opinions herein are not legally binding on any party.

Comments Submitted

CRA considers "interested parties" to be an individual, company, or organization with an interest in the subject at hand and in the development of Qatar's telecommunications sector.

Comments on the consultation document were received from the following interested parties/stakeholders:

1. Ooredoo Qatar (Q.S.C)
2. Vodafone Qatar
3. GSMA
4. Dynamic spectrum Alliance Limited
5. WiFi Alliance
6. Ericsson
7. Huawei

8. Nokia
9. Oppo
10. ZTE
11. Apple
12. Broadcom
13. Cisco Systems
14. CommScope
15. Facebook
16. Hewlett Packard Enterprises
17. Intel Corporation
18. Microsoft Corporation
19. Qualcomm Technologies
20. Dell Technologies
21. HP Enterprise

CRA wishes to thank all the above parties for their valuable inputs to the document and consider them really crucial in the development of Telecommunciations and ICT sectors in the state of Qatar and the MENA region.

CRA allows contributors to seek confidentiality when submitting information, but publication shall be entirely at the discretion of CRA. Non-confidential versions of submissions and those deemed by CRA to be lacking commercially sensitive information will be made available on CRA's website.

Summary of Comments and Response of CRA

Section 1

Agreement

All the participants unanimously agree on this that allocation of lower part of the 6 GHz spectrum i.e. 5925-6425 MHz must be made at the earliest for license exempt use in order to ensure high-speed and high-quality, widespread, affordable broadband to all households across the world.

Disagreement

There is a huge debate between telecom service providers and device manufacturers and the ICT industry that include big names such intel, Facebook, HP, cisco etc. regarding allocating the upper 6GHz band i.e. 6425 – 7125 MHz for license exempt use.

Telecom service providers and device manufacturers are of the opinion that that there is only one band left for allocation below 10 GHz that is the crucial for future development of 5G and hence the upper part of the 6 GHz spectrum i.e. 6425 – 7125 MHz must be reserved for IMT services.

Their argument is based on the following reasons:

- 6 GHz is a key opportunity, if not the last remaining one after 3.8-4.2 GHz, in the middle frequency range that offers large contiguous channels for 5G for wide-scale IMT deployment. As mmWave spectrum would always have these propagation constraints no matter how advanced the technology could become that would prevent it from becoming widely deployable.
- The economic impact of making the upper part of the 6GHz spectrum would be much more than if the band is allocated on license exempt basis.
- It is a safer bet as making a licensed spectrum license exempt is easier than making it so vice versa. Once a spectrum is opened for license exempt use, it becomes really challenging to vacate it and make it ready for the licensed use.
- Allocation of 500MHz additional spectrum for WiFi use would be more than enough to ensure deployment of higher capacity connections.
- The band 6425-7125 MHz is under discussion for WRC-23 Agenda Item 1.2 for Region 1 (and part of it globally) for IMT. Secondly there is a major push by device manufacturers to support this additional band in upcoming devices.
- Exclusive licenses provide certainty of access to spectrum, which in return support huge investments in high quality, wide area mobile networks worldwide. This exclusive licensing approach has been central to connecting well over 5 billion people to mobile services worldwide. Mobile technologies continue to evolve to make the most efficient use of licensed spectrum to deliver better services to more people in more places.
- The band 6425-7125 MHz is used in many countries for fixed links to provide mobile backhaul and also retains satellite use. Protecting mobile backhaul, which can be coordinated in a licensed 5G environment, may cause problems in licence-exempt bands.

- Sharing studies done so far suggest the only indoor use would ensure the protection of incumbent services i.e. backhaul and satellite services. Co sharing of incumbent services with outdoor Wifi devices seems to be really challenging at this moment.

The ICT industry on the other hand have welcome CRA's proposal to allocate the entire 6 GHz spectrum i.e. 5925 – 7125 MHz (1200 MHz) for license exempt use of WiFi Devices. Their argument is based on the following reasons:

- Allocation of this spectrum would ensure the growth of various sectors in the ICT industry. As per a study conducted by WiFi Alliance the global economic value of just WiFi alone today stands at Usd 3.3 trillion which is expected to grow to Usd 4.9 Trillion in 2025. Hence allocation of 1200 MHz license exempt spectrum is crucial in order to ensure such enormous socio-economic value.
- Globally, many of the top 20 economies in the world have opened, or are in the process of opening, the entire 6 GHz band for Class License use.
- WiFi standards for the entire band are already in place and WiFi 6E devices are ready for deployment. IEEE extended the support for entire band under the standard 802.11ax. Similarly WiFi alliance certification is now available to ensure interoperability of the WiFi 6 devices. Multiple product vendors have also announced Wi-Fi 6E devices that make use of the super wide 160 MHz channels and uncongested spectrum in 6 GHz to deliver multi-gigabit, low-latency Wi-Fi. The Wi-Fi Alliance projects that 316 million Wi-Fi 6E devices will be sold in 2021 globally. The vast majority of these devices are expected to be capable of operating over the entire 6 GHz band.
- Co-sharing studies done so far in US and Europe[1] suggest that the interference free operation of WiFi 6 devices is easily possible with higher powers i.e. upto 30dBm for indoor use and upto 17 dBm for outdoor use. Similarly with AFC and TPC the standard power use could also be allowed where required through a light licensing regime.
- In case additional spectrum is required 3GPP's NR-U standard could also ensure use of unlicensed spectrum for 5G deployments. Hence allocating the entire 1200 MHz spectrum license-exempt spectrum would not necessarily obstruct its use for 5G future development.
- WiFi 6 is not really a rival to 5G, it is in fact crucial in enabling 5G and future wireless broadband. For example, by 2022, nearly 60 percent of global mobile data traffic is projected to be offloaded onto the fixed network through Wi-Fi or femtocells. And, as mobile and Wi-Fi technologies evolve and continue to be integrated to meet wireless and mobile communications needs, demand

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[1]

ECC Report 316: Sharing studies assessing short-term interference from Wireless Access Systems including Radio Local Area Networks (WAS/RLAN) into Fixed Service in the frequency band 5925-6425 MHz (approved 21 May 2020), which studies short-term interference and sharing with VLP devices https://www.ecodocdb.dk/download/8951af9e-1932/ECC%20Report%20316.pdf

Industry coalition of companies (6USC Group) Fixed Link Interference Testing: https://ecfsapi.fcc.gov/file/108230735019254/6GHz%20FS%20coexistence%20study%20ex%20parte%20(final).pdf

RKF Engineering Solutions LLC, Frequency Sharing for Very Low Power Radio Local Area Networks in the 6 GHz Band https://ecfsapi.fcc.gov/file/1063041931946/6%20GHz%20FNPRM%20Comment%20Submission%206.29.20.pdf

for license-exempt spectrum will continue to grow. 5G networks will be critical for mobile connectivity, and Wi-Fi will be critical for connecting to broadband at home and work (in-building environments) due to quality of service and lower cost.

CRA Response:

CRA acknowledges the arguments presented by both camps. Keeping all these in view, our decision for now is however to stick to our initial proposal of assigning the entire 6GHz band for license exempt use because of the following reasons in addition to the ones presented by the other stakeholders in support of the proposal:

- Opening the entire 5925-7125 MHz band will ensure significant economic value for the State of Qatar and profoundly contribute to fulfilling the Economic Development and other objectives of Qatar's National Vision 2030.
- We acknowledge that since the World Radiocommunication Conference in 2003 no new mid-band spectrum has been made available for Wi-Fi despite the exponential growth in the data traffic. Furthermore, current Wi-Fi spectrum doesn't offer sufficiently wide channels for newer applications and services that are a complement for the 5G ecosystem.
- We believe that enough spectrum is available for the 5G deployment across lower, mid and high bands to cater for the current and future needs of the technology.
- We consider WiFi 6 and 5G as complimentary technologies and hence giving opportunities for future development of both of them would remain our priority.

Section 2
ANNEXURE (2) – Technical Requirements for use of RLAN Devices over 5925-7125 MHz Band

This section includes a summary of the comments received from the Industry on this Annexure (2) of the class license. As per the comments there are following different options proposed by the stakeholders:

Proposal 1:

Type	Authorized Frequency Bands/ Frequencies (Channel Spacing)	Maximum Strength/ RF Output Power	Power Spectral Density	Remarks (Emission Type, Duty Cycle, other restrictions)
Low Power	5925-7125 MHz	e.i.r.p 30 dBm	5 dbm/MHz	Indoor Use only
Very Low Power	5925-7125 MHz	e.i.r.p 14 dBm	-8 dbm/MHz	Indoor and Outdoor Use ETSI EN 303 687

The proponents of these limits presented following reasons in support of their proposal:

- The standard EN 303 687 currently covers only the lower 6 GHz band i.e. 5925- 6425 MHz, hence it is proposed to keep it to this limit and wait for the finalization of the standard for upper 6 GHz band i.e. 6425 – 7125 MHz. Until then FCC technical specification 47CFR Part 15,407 subpart E should be applied for the full 5.925 - 7.125 GHz band.
- Hence proposal is to Align the maximum RF transmit power for Low Power Indoor category of devices to 23dBm eirp, instead of 24 dBm (as per coexistence studies in ECC Report 302/ ECC Report 316) and study protection of FS, noting that studies in CEPT were based on the regional FS allocations and include reference for ETSI EN 303 687 also for Lower Power devices.
- It is also proposed to enforce TPC and DFS requirements on the use of even the Lower 6 GHz band i.e. 5925- 6425 MHz.

Proposal 2:

Type	Authorized Frequency Bands/ Frequencies (Channel Spacing)	Maximum Strength/ RF Output Power	Power Spectral Density	Remarks (Emission Type, Duty Cycle, other restrictions)
Low Power	5925-7125 MHz	e.i.r.p 30 dBm	10 dbm/MHz	Indoor Use only
Very Low Power	5925-7125 MHz	e.i.r.p 17 dBm	1 dbm/MHz	Indoor and Outdoor Use

The proponents of these limits presented following reasons in support of their proposal:

- The limits proposed by CRA are overly restrictive and doing so may impede development of the rapidly evolving Wi-Fi 6E ecosystem and preclude implementation of use cases in various sectors such as healthcare, wearables, IoT and other sectors.
- In case of LPI RLAN, higher power levels are necessary to support Wi-Fi 6E enhanced data throughput capabilities to reach beyond one or two rooms without the need for signal extenders or additional equipment. In contrast, reduced power levels will lead to two main problems. First, Qatari consumers and businesses will experience a loss of Wi-Fi 6E coverage area. In particular, PSD at 5 dBm/MHz reduces coverage range by 31-43%. Second, Wi-Fi 6E users will experience reduction in throughput in the area that remains covered. A 5 dBm/MHz limit reduces throughput by 53-63%.
- European decision on the technical conditions for LPI RLANs in the 6 GHz band specifies maximum PSD limit of 10 dBm/MHz2.

[2] ECC Decision (20)01 On the harmonized use of the frequency bands 5945 to 6425 MHz for implementation of Wireless Access Systems including Radio Local Area Networks (WAS/RLAN) at Table 1 on Pg. 6 available at https://docdb.cept.org/download/50365191-a99d/ECC%20Decision%20(20)01.pdf *See also* UK Ofcom Consultation: Improving spectrum access for Wi-Fi spectrum use in the 5 and 6 GHz bands at Pg. 64 (Jan. 2020) https://www.ofcom.org.uk/__data/assets/pdf_file/0038/189848/consultation-spectrum-access-wifi.pdf

- In US FCC proposes to increase the PSD for LPI devices from 5 dBm/MHz to 8 dBm/MHz with a maximum permissible EIRP of 33 dBm3.
- In case of VLP RLAN, extensive technical studies have demonstrated that VLP devices operating either indoors or outdoors would not cause harmful interference. Importantly, the VLP RLAN devices are largely personal network devices that will be operated primarily indoors where they would have even lower interference potential than LPI RLANs. To further mitigate interference potential from limited outdoor VLP RLAN operations, VLP RLANs may be required to implement the Transmit Power Control ("TPC"). TPC is a well-established interference mitigation factor. The International Telecommunications Union ("ITU") Radio Regulations for implementation of Radio Local Area Networks, Resolution 229 states that in the 5 GHz bands, systems in the mobile service (including Wi-Fi devices) should employ TPC to provide, on average, at least 3 dB mitigation on the maximum average output power.
- Other countries have already adopted rules that permit the use of VLP RLAN devices at 14 dBm e.i.r.p and PSD at 1 dBm/MHz, hence it would be preferred to adopt the same in order to achieve the regional or international harmonization.
- Increasing the transmit power for VLP future proofs the allocation to support Wi-Fi 7 enabling 320 MHz wide channels.

Proposal to allow higher power use under light licensing Regime:

In addition to the low power and very low power use of the WiFi 6 devices, it is also recommended to allow the standard higher power WiFi devices through light licensing regime with AFC requirement under following conditions:

Type	Authorized Frequency Bands/ Frequencies (Channel Spacing)	Maximum Strength/ RF Output Power	Power Spectral Density	Remarks (Emission Type, Duty Cycle, other restrictions)
Standard power	5925-7125 MHz	e.i.r.p 36 dBm	23 dbm/MHz	Indoor and Outdoor Use

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[3] *Unlicensed Use of the 6 GHz Band*, Report and Order and Notice of Proposed Rulemaking, FC 20-51, ET Docket No. 18-295 and GN Docket No. 17-183 (rel. Apr. 24, 2020) at 244-45, available at: https://docs.fcc.gov/public/attachments/FCC-20-51A1.pdf

CRA Response:

As per the inputs received from the stakeholders CRA is inclined towards adopting the following limits for Low power and Very low power uses of the band with TPC and DFS requirements:

Type	Authorized Frequency Bands/ Frequencies (Channel Spacing)	Maximum Strength/ RF Output Power	Power Spectral Density	Remarks (Emission Type, Duty Cycle, other restrictions)
Low Power	5925-7125 MHz	e.i.r.p 30 dBm	10 dbm/MHz	Indoor Use only
Very Low Power	5925-7125 MHz	e.i.r.p 17 dBm	1 dbm/MHz	Indoor and Outdoor Use

We are also inclined to allow the standard power use of the band with AFC requirement under following conditions:

Type	Authorized Frequency Bands/ Frequencies (Channel Spacing)	Maximum Strength/ RF Output Power	Power Spectral Density	Remarks (Emission Type, Duty Cycle, other restrictions)
Standard power	5925-7125 MHz	e.i.r.p 36 dBm	23 dbm/MHz	Indoor and Outdoor Use