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April 8, 2021

Mr. Mohammed Ali Al-Mannai
President of the Communications Regulatory Authority
Communications Regulatory Authority (CRA)
State of Qatar
type.approval@cra.gov.qa

Re: DSA Comments to the Public "Consultation on Class License for the use of RLAN devices over 5925-7125 MHz band".

Dear Sir/Madam,

The Dynamic Spectrum Alliance (DSA[1]) respectfully submits its comments in response to the Public Consultation on "Class License for the use of RLAN devices over 5925-7125 MHz band (Wi-Fi 6)". The DSA welcomes the Communications Regulatory Authority of Qatar for providing the opportunity for presenting our views and comments on this document, as well as CRA's actions to cope with the rapid developments in the telecom standardizations and in particular with Wi-Fi 6E.

DSA members would like to express our unanimous and enthusiastic support for the CRA's proposal to authorize the use of the 5925-7125 MHz band (6 GHz band) by license-exempt Wireless Local Area Networks (WLAN) like RLAN. We believe that the CRA is moving on the right direction and that spectrum access for Wi-Fi 6E will foster innovation and provide last-generation connectivity and digital empowerment. The DSA is available to discuss these comments and any additional requirement.

Respectfully submitted,

Martha SUAREZ
President
Dynamic Spectrum Alliance

[1] The DSA is a global, cross-industry, not for profit organization advocating for laws, regulations, and economic best practices that will lead to more efficient utilization of spectrum, fostering innovation and affordable connectivity for all. Our membership spans multinationals, small-and medium-sized enterprises, as well as academic, research and other organizations from around the world all working to create innovative solutions that will benefit consumers and businesses alike by making spectrum abundant through dynamic spectrum sharing. A full list of DSA members is available on the DSA's website at www.dynamicspectrumalliance.org/members

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DSA COMMENTS

The DSA promotes a balanced regulatory approach between licensed, unlicensed, and lightly licensed, to enable making unused spectrum available for broadband. An unbalanced approach may create artificial scarcity, which rises the cost of broadband access. In this sense, the DSA believes that licensed and unlicensed spectrum bands will both play important and complementary roles in the delivery of 5G services and that coordinated shared spectrum should be considered in spectrum planning. As part of spectrum planning, the DSA also supports spectrum sharing innovation that will lead to the more efficient utilization of spectrum and foster innovation and affordable connectivity for all.

DSA completely agree on the recommendations from the CRA to allocate the entire 5925-7125 MHz band for the indoor and outdoor use by RLAN devices (Wi-Fi 6). Effectively, considering the almost 100% penetration of fiber home coverage in Qatar, it is crucial to allocate additional spectrum for shared use in order to provide affordable and high-speed broadband to the inhabitants of Qatar. Additionally, enough TDD mid-band spectrum has already been assigned for IMT services in Qatar and hence there is no need to allocate or reserve additional spectrum in order to benefit from 5G deployment.

From the DSA perspective, 5G and Wi-Fi technologies are powerful complements, not rivals. Licence-exempt RLAN technologies (e.g., Wi-Fi, 5G NR-U) are a critical component for enabling 5G services.[2] Regulators must ensure that there is sufficient licence-exempt spectrum to complement that available to 5G licensed networks. The concept of "balance" must encompass the whole of spectrum allocations and designations. Furthermore, as recognized by CRA, IMT services could use 5G New Radio Unlicensed (NR-U) in this band if the need arises. Like Wi-Fi 6 and the upcoming Wi-Fi 7, when used in combination with licensed or shared spectrum, anchored 5G NR-U helps mobile operators deliver 5G with better, faster mobile broadband for consumers.

Regarding the fact that enough TDD mid-band spectrum has already been assigned for IMT services in Qatar and hence there is no need to allocate or reserve additional spectrum in order to benefit from 5G deployment, DSA agrees with CRA and highlights the fact that the 5G strategy goes beyond assigning

[2] *See* Enterprises building their future with 5G and Wi-Fi 6, Deloitte's Study of Advanced Wireless Adoption (link)

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high-band, mid-band and low-band spectrum for licensed access. The 5G Fast Plan[3] in the United States recognizes that unlicensed spectrum will be important for 5G, and that new opportunities for the next generation of Wi-Fi in the 6 GHz band should be created. A similar decision of releasing the entire range from 5925 to 7125 MHz has been made by countries in regions 1, 2 and 3 of the ITU, such as the Republic of Korea, Chile, Brazil, Guatemala, Honduras and Saudi Arabia. Other countries have conducted or have on-going public consultations about the future of this band (Australia, Taiwan, Jordan, Egypt, Canada, Costa Rica, Colombia, Mexico, Peru, Argentina) and are expected to follow this lead soon.

Final regulations have been already adopted by the United Kingdom and the United Arab Emirates for the 5925-6425 MHz range, and the European Union Member States are expected to designate and make available the 5945-6425 MHz range for the implementation of WAS/RLANs this month.

The additional 1200 MHz will provide sufficient broadband capacity so that multiple individuals operating devices running high-bandwidth applications (e.g., high-definition video, augmented and virtual reality, interactive content for education and training) can concurrently access the Wi-Fi network at their location (e.g., residence, shops, businesses, industrial facilities, airports).

According to Cisco, more than half of the Internet connections start or end by a Wi-Fi connection. However, Wi-Fi networks congestion at the access point level is becoming an issue because access to unlicensed mid-band spectrum creates an artificial spectrum shortage: 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.[4] Furthermore, current Wi-Fi spectrum doesn't offer sufficiently wide channels for newer applications and services that are a complement for the 5G ecosystem.

Wi-Fi 6, based on the IEEE 802.11ax standard, is the new generation of Wi-Fi. It allows the use of 160 MHz bandwidth channels and incorporate important new features such as the possibility of supporting more clients in dense environments, greater efficiency, flexibility, scalability and network security. Unlike

[3] *See* The FCC's 5G FAST Plan (link)
[4] *See* "How to realise the full potential of 6 GHz spectrum". Whitepaper. October 2020 (link)

previous generations of Wi-Fi and wireless networks, 5G and Wi-Fi 6 networks can interact seamlessly with each other. Indeed, unlicensed spectrum is recognized as a fundamental enabler of the 5G ecosystem as unlicensed operations are incorporated into the standards. The IEEE has extended its 802.11ax standard to include the entire 6 GHz band (Wi-Fi 6E).

Currently available spectrum in the 2.4 GHz and 5 GHz bands will not be able to absorb the amount of data expected to be provided through 5G networks and beyond in addition to the huge growth in the number of devices connected to the Internet through what is known as the Internet of Things ("IoT"). Wi-Fi 6E will enable new use cases for industrial IoT, smart homes and support for high-density deployments, to name a few, but access to more and wider channels is needed to support these new use cases.[5]

The effect of enabling additional spectrum for Wi-Fi will be relevant on launching IoT services and 5G Technology. Unlicensed access to the 6 GHz band is required to meet the unprecedented demand and enable innovative use cases. With it, comes the opportunity for more effective spectrum use allowing support for new applications and laying the foundations for innovation.[6]

The additional benefit of permitting unlicensed access throughout the 6 GHz band will be for offloading data from current 4G and future 5G wireless networks. Mobile data usage has been increasing in the last years and as indicated in the consultation document, it is estimated that by the end of the year 2020, global mobile data traffic would reach a monthly rate of 30.6 exabytes, as compared to 3.7 exabytes in 2015.

According to the document of the public consultation, the Class License granted by CRA enables any person to possess, use, operate, install and use Wi-Fi 6 devices within the State of Qatar without that licensee having to apply for this Class license. DSA completely supports this decision of a Class License on a non-exclusive basis that protects incumbents and at the same time enables innovation leading to very efficient spectrum use.

[5] *See* https://wballiance.com/wp-content/uploads/2019/09/WBA-AnnualIndustry-Report-2020.pdf
[6] *See* "The crucial decision of enabling better and affordable connectivity through Wi-Fi and spectrum sharing", December 2020 (link)

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This decision is very convenient at this time, because Wi-Fi chipsets for Wi-Fi 6E products are already commercially available. Last December, the U.S. Federal Communications Commission (FCC) certified the first Wi-Fi 6E chipset[7] and its first 6 GHz Wi-Fi device.[8] In early January of 2021, the Wi-Fi Alliance began certifying Wi-Fi 6E devices, paving the way for new gadgets that can transmit across the entire 6 GHz band.[9] Wi-Fi 6E products have being announced at this year's (virtual) Consumer Electronics Show.[10] On January 14th, Samsung announced a new mobile phone that incorporated a Wi-Fi 6E client.[11] In light of this momentum, the research firm IDC has forecast that more than 316 million Wi-Fi 6E devices will enter the market in 2021 and shipments will rise rapidly over the next three years.[12] So clearly the Wi-Fi 6E ecosystem is ready and will continue to grow at an accelerated pace in the coming months. Making the entire 5925-7125 MHz band license-exempt will provide benefits for end users in the State of Qatar immediately.

DSA is convinced that opening up 6 GHz frequency band for Wi-Fi is the right move to ensure that this widely used wireless technology can deliver the necessary performance for future applications and networks. It is important to mention that unlicensed access to the 6 GHz band could enable three different operating classes:

- Very Low Power ("VLP"): devices which would be permitted to operate at very low power levels for indoor or outdoor use. They provide low latency and very high throughput over short distances.

[7] *See* FCC, "Grant of equipment authorization QDS-BRCM1095 (link)".
[8] *See* "Chairman Pai Statement on FCC Authorization of First 6 GHz Wi-Fi Device" (December 7, 2020). DOC-368593A1.pdf (fcc.gov)
[9] *See* "Wi-Fi Alliance® delivers Wi-Fi 6E certification program" (January 7, 2021). Wi-Fi Alliance® delivers Wi-Fi 6E certification program | Wi-Fi Alliance (wi-fi.org)
[10] *See* "Linksys Introduces Fastest and Most Powerful Wi-Fi 6E Mesh System and Enhanced Motion Detection" (January 11,2021). https://www.prnewswire.com/news-releases/linksys-introduces-fastest-and-most-powerful-wi-fi-6e-mesh-system-and-enhanced-motion-detection-301205475.html; See "Nighthawk® Tri-Band WiFi 6E Router (up to 10.8Gbps) with new 6GHz band, NETGEAR Armor™" (January 11,2021). AXE11000 WiFi Router (netgear.com); *See* "TP-Link Unveils New Networking Offerings, Bringing a Blazing-Fast, Ultra-Secure Broadband Experience to Consumers and Businesses" (January 11, 2021). https://www.tp-link.com/us/press/news/19331/ ; .
[11] Samsung Press Release, "Samsung Galaxy S21 Ultra: The Ultimate Smartphone Experience, Designed To Be Epic In Every Way". https://news.samsung.com/global/samsung-galaxy-s21-ultra-the-ultimate-smartphone-experience-designed-to-be-epic-in-every-way
[12] *See* https://www.wi-fi.org/news-events/newsroom/wi-fi-alliance-delivers-more-value-from-wi-fi-in-6-ghz

VLP portable usages are for example mobile AR/VR, UHD video streaming, high speed tethering and in-vehicle entertainment.

- Low Power Indoor ("LPI"): such as an Access Point or client device, which would be permitted to operate for indoor use only. LPI use cases include residential Multi-AP/mesh networks, multiple dwelling unit ("MDU"), single-AP networks, high-density enterprise networks, indoor public venues and industrial IoT.

- Standard Power ("SP"): unlicensed devices operating at 36 dBm EIRP that are only permitted access to spectrum under the control of an Automated Frequency Coordination ("AFC") system, which would establish exclusion zones where unlicensed devices could not operate. High throughput capabilities for outdoors and indoors. Relevant for outdoor hotspots.

Every use case could provide important benefits in the State of Qatar and the Commission can decide on the specific conditions to enable these different operating classes.

The current proposal recommends Low-power (for indoor use only) and Very low-power (portable use both indoor and outdoor) applications. DSA respectfully suggests including Standard Power operations in the 5925-7125 MHz range (both indoor and outdoor use) as part of the Class License that was proposed.

Last year, the United States regulator, the Federal Communication Commission (FCC), authorized unlicensed operations 'standard power' (i.e. higher power indoor and outdoor) RLAN operations in the 5925-6425 MHz and 6525-6875 MHz portions of band based on the need to protect incumbent operations specific to the United States.[13] The FCC claims that "*Wi-Fi 6 will be over two-and-a-half times faster than the current standard and will offer better performance for American consumers. Opening the 6 GHz band for unlicensed use will also increase the amount of spectrum available for Wi-Fi by nearly a factor of five and help improve rural connectivity*."[14]

[13] *See* https://docs.fcc.gov/public/attachments/FCC-20-51A1.pdf
[14] *See* https://docs.fcc.gov/public/attachments/DOC-363945A1.pdf

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The 6 GHz band (5925-7125 MHz) is well suited to bridging the unlicensed mid-band spectrum gap and will greatly enhance the impact of next generation Wi-Fi. Harnessing the 6 GHz band will improve indoor connectivity and enable the emergence of a new generation of advanced applications and services based on the Wi-Fi 6 standard. It would support demanding personal area network applications, such as transferring data between a smartphone and an AR or VR headset to the benefit of providers of entertainment (gaming, content), industrial applications, eHealth and other services.

With access to the 6 GHz band, Wi-Fi is also set to play a pivotal role in the further automation of manufacturing plants and other parts of industry. In South Korea, Taiwan, the US and other advanced manufacturing hubs, businesses increasingly regard Wi-Fi as an effective and efficient way to both monitor and remotely control machinery and other assets. To remain competitive, companies in other parts of the world are set to follow suit once the 6 GHz band is available on an unlicensed basis.

With respect to the power spectral density (PSD) values proposed by CRA for LPI and VLP equipment, we believe that these values are conservative. We are convinced that, considering the results of the extensive coexistence studies conducted in the United States and Europe, the risk of harmful interference from 6 GHz Low-Power Access Points operating indoors to incumbents is sufficiently low when the maximum PSD is limited to10 dBm/MHz, the value specified in Draft ETSI Standard EN 303 687.

We are confident that, given the specific situation of 6 GHz incumbent services in Qatar, i.e., very limited use of Fixed Service and satellites, even a maximum e.i.r.p. level of 30 dBm for Low-Power Access Points operating indoors would not generate harmful interference to incumbent services.

In like manner, we believe that for VLP equipment a PSD limit of 1 dBm/MHz will be sufficient to reliably protect incumbent services. This value is specified in Draft ETSI Standard EN 303 687 which is referenced in Annexure (2).

The decision to allocate the entire 5925-7125 MHz band for the indoor and outdoor use by RLAN devices (Wi-Fi 6) would confirm CRA's long-term vision, laying the groundwork for early adoption of Wi-Fi 7 in the State of Qatar. Indeed, the standardization process of the next generation of the IEEE 802.11 family

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standard, 802.11be, also known as Wi-Fi 7, is ongoing. The initial draft (0.1) is expected to be defined in the first half of 2021, with the launch of certification processes at the end of 2023, including channels of up to 320 MHz of bandwidth for Wi-Fi connections and other functionalities.

The importance of WLAN use and substantial amount of Wi-Fi carried traffic has been exemplified during the COVID-19 lockdowns worldwide. The flexibility and benefits Wi-Fi brings to digital economies have proven to provide essential benefits during the COVID-19 pandemic.[15] This decision is very convenient and the DSA fully supports the proposal with some recommendations for the operating parameters that will increase the identified benefits.

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[15] *See* "Covid-19 and the economic value of Wi-Fi. Katz", Jung and Callorda, December 2020.