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Attention: Senior Telecommunications Engineer
(Spectrum Planning) 1

VIA ELECTRONIC FILING

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Re: Creation of a Class Licence for Regulating the Use of and Trade in 6 GHz Devices for Wireless Local Area Network and Variation to the Class Licence for Provision of Public Wireless Local Area Network Services - Consultation Paper

Dear Colleagues,

Wi-Fi Alliance commends the Office of the Communications Authority ("CA") on its ongoing work in the area of spectrum management. The Creation of a Class Licence for Regulating the Use of and Trade in 6 GHz Devices for Wireless Local Area Network and Variation to the Class Licence for Provision of Public Wireless Local Area Network Services - Consultation Paper ("*Consultation*") is an important mechanism for soliciting feedback that will provide the CA with the information necessary to proceed.^{1/} Wi-Fi Alliance welcome the opportunity to provide the CA with information concerning Wireless Local Area Networks (WLANs) spectrum requirements for future broadband wireless connectivity services.

Introduction

Wi-Fi Alliance is a global, non-profit industry association of over 850 leading companies from dozens of countries devoted to seamless interoperability. With technology development, market building, and regulatory programs, Wi-Fi Alliance has enabled widespread adoption of Wi-Fi worldwide, certifying thousands of Wi-Fi products each year. WLAN using Wi-Fi standards have become increasingly important in connecting people and devices. Hundreds of millions of people rely on Wi-Fi to connect billions of devices every day, and studies show this is increasing rapidly.^{2/} Devices using spectrum that supports Wi-Fi are now the primary means by which Hong Kong connects to the Internet. This central role will only increase in the

^{1/} See The Creation of a Class Licence for Regulating the Use of and Trade in 6 GHz Devices for Wireless Local Area Network and Variation to the Class Licence for Provision of Public Wireless Local Area Network Services - Consultation Paper, available at: www.coms-auth.hk/filemanager/en/content_711/cp20211126_e.pdf

^{2/} See *Wi-Fi Celebrates 20 Years with More Than 20 Billion Anticipated Device Shipments over the Next Six Years*, ABI Research (Jun. 13, 2019) available at: <https://www.abiresearch.com/press/wi-fi-celebrates-20-years-more-20-billion-anticipated-device-shipments-over-next-six-years/>

future, because Wi-Fi technology will be an essential complement to Fifth Generation wireless (“5G”) networks, as highlighted by the recently released Cisco VNI Mobile Report showing that traffic offloaded to Wi-Fi will increase with each successive technology generation.^{3/} From 2G to 3G, from 3G to 4G and now moving to 5G, the dependence of cellular networks on Wi-Fi offload continues to increase. It is projected that over 70% of 5G traffic will be offloaded to Wi-Fi by 2022.^{4/} All this data delivered by Wi-Fi-enabled devices requires spectrum capacity. Wi-Fi Alliance’s previously released *Spectrum Needs Study*^{5/} demonstrated that significantly more spectrum access is required to meet immediate connectivity needs. Importantly, the connectivity provided by Wi-Fi delivers billions of dollars in value to the economy.^{6/}

Growing Demand for Wi-Fi Drives the Need for Spectrum Access in 5925–7125 MHz Band

As noted in the *Consultation*, several countries already recognized the unique benefits of the 5925-7125 MHz spectrum for WLAN deployments and the needed to support rapidly growing demand for Wi-Fi and their gigabit connectivity objectives.^{7/} In addition to countries listed in the in the *Consultation-Appendix 1*, the CA should note that Brazil, Chile, Costa Rica, Guatemala, Honduras, and Saudi Arabia already decided to allow WLAN operations in the 5925-7125 MHz band while several other countries considering similar action.^{8/} Moreover, the COVID-19 pandemic has dramatically increased the demand for Wi-Fi connectivity, due to the broad usage of teleworking, remote learning/home schooling, entertainment, and online commerce. A recent study indicates that the demand for Wi-Fi connectivity has increase at unprecedented rate particularly for Wi-Fi data consumption and number of actively used devices.⁹

The CA’s *Consultation* comes at a pivotal time in the development Wi-Fi ecosystem. Earlier this year, Wi-Fi Alliance introduced new Wi-Fi 6E terminology to distinguish the latest generation Wi-Fi 6 devices that are capable of 6 GHz operation.^{10/} Wi-Fi 6E brings a common industry name for Wi-Fi users to identify devices that offer the features and capabilities of Wi-Fi 6 – including higher performance, lower latency, and faster data rates – extended into the 5925–7125 MHz band. Wi-Fi 6E devices are quickly becoming available, following regulatory approvals in several countries.^{11/} As the 6 GHz regulatory landscape evolves, Wi-Fi Alliance member companies will expand the Wi-Fi 6E ecosystem even further.^{12/} In 2021, over 300 million

^{3/} See Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2017–2022, White Paper at 18, <https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white-paper-c11-738429.pdf>

^{4/} See Broadcom, *Wi-Fi in the 5G Era*, at slide 24 (2019), https://newamericadotorg.s3.amazonaws.com/documents/Wi-Fi_in_the_5G_Era_-_Broadcom_presentation.pdf.

^{5/} Wi-Fi Alliance, *Spectrum Needs Study* at 23 (Feb. 2017) https://www.wi-fi.org/downloads-registered-guest/Wi-Fi%2BSpectrum%2BNeeds%2BStudy_0.pdf/33364.

^{6/} See <https://www.wi-fi.org/discover-wi-fi/value-of-wi-fi>

^{7/} *Consultation*, Appendix 1.

^{8/} See <https://www.wi-fi.org/countries-enabling-wi-fi-6e>

⁹ See AirTies Wireless, The Catalyst Effect at https://airties.com/the-catalyst-effect?utm_source=wifi_now&utm_medium=article&utm_campaign=catalyst_effect_1020

^{10/} See Wi-Fi Alliance® brings Wi-Fi 6 into 6 GHz, WI-FI ALLIANCE (Jan. 3, 2020) <https://www.wi-fi.org/news-events/newsroom/wi-fi-alliance-brings-wi-fi-6-into-6-ghz>.

^{11/} See Countries Enabling Wi-Fi 6E at <https://www.wi-fi.org/countries-enabling-wi-fi-6e>

^{12/} See Product Finder, WI-FI ALLIANCE (last visited on Feb. 22, 2021) https://www.wi-fi.org/product-finder-results?sort_by=certified&sort_order=desc&certifications=1335.

Wi-Fi 6E devices are expected to enter the market.^{13/} Regulatory harmonization in the 5925–7125 MHz band will create economies of scope and scale and produce a robust equipment market, benefitting businesses, consumers, and the economy.

Optimal performance of the current (Wi-Fi 6E) and future generations of Wi-Fi depends on access to necessary spectrum. Precluding Wi-Fi access to 6425-7125 MHz portion of the 6 GHz band would substantively reduce Wi-Fi 6E performance in terms of latency and data throughput. The 5925-6425 MHz band does not offer sufficient spectrum to support future Wi-Fi connectivity needs. And, importantly, there are no alternative frequency bands that can accommodate expanding Wi-Fi spectrum requirements and the growing ecosystem in the future. Wi-Fi Alliance respectfully asks the CA to note that both 5945-6425 MHz and 6425-7125 MHz bands are uniquely suited to accommodate the urgent need for additional Wi-Fi spectrum access for the following reasons:

- Self-coordinating, multi-channel Wi-Fi networks relying on dynamic random spectrum access and contention-based protocols require access to multiple channels to maintain acceptable performance. The current Wi-Fi standard (Wi-Fi 6/6E) specifies channel bandwidths of up to 160 MHz, while the next amendment under consideration ([Wi-Fi 7](#), Extremely High Throughput) will specify channel bandwidths of up to 320 MHz. The 500 MHz (i.e., 5925-6425 MHz) is simply insufficient to accommodate multiple 320 MHz channels. The 1200 MHz (i.e., 5925-7125 MHz) of contiguous spectrum would enable 14 additional 80 MHz channels, 7 additional 160 MHz channels or 3 additional 320 MHz channels which are needed for high-bandwidth applications that require faster data throughput such as high-definition video streaming and virtual reality. Wi-Fi 6E and subsequent generations of Wi-Fi technology will leverage these wider channels and additional capacity to deliver greater network performance and support more Wi-Fi users at once, even in very dense and congested environments
- Existing Wi-Fi equipment designed for the 5 GHz band can be rapidly adapted and deployed across the 6 GHz frequency range, offering significant economies of scale and other benefits.
- Efforts to enable Wi-Fi in the full 6 GHz range are already underway in many countries.^{14/} While European regulators completed the initial step of opening the 5945-6425 MHz band (lower 6 GHz) for WAS/RLANs, there is broad recognition that a follow-up action is needed to address the projected demand for Wi-Fi spectrum in the upper 6 GHz band (i.e. 6425-7125 MHz).^{15/}

In light of the above, Wi-Fi Alliance urges the CA to initiate consideration of WLAN deployments in the 6425-7125 MHz.

Neither 5925-6425 MHz nor 6425-7125 MHz Frequency Bands Are Viable Candidates for 5G Services

Wi-Fi Alliance agrees with the Radio Spectrum and Technical Standards Advisory Committee (“SSAC”) previous recommendation that WLAN should not cause interference to the existing fixed-satellite service

^{13/} See Wi-Fi 6E: The Market Opportunity for Wi-Fi 6 in the 6GHz Spectrum Band, IDC Market Presentation (Apr. 2020) <https://www.idc.com/getdoc.jsp?containerId=US46220720>.

^{14/} See Countries Enabling Wi-Fi 6E at <https://www.wi-fi.org/countries-enabling-wi-fi-6e>

^{15/} See ECC Work Item on WAS/RLANs in 6425-7125 MHz, available at: http://eccwp.cept.org/WI_Detail.aspx?wiid=795

("FSS") (Earth-to-space) or other incumbents operating in the 6 GHz band.^{16/} In this regard, WI-FI Alliance respectfully asks the CA to note that considerable technical and regulatory efforts already have been undertaken to analyse spectrum sharing conditions in 6 GHz frequency range.^{17/} The result of these efforts identified a set of regulatory conditions that are necessary to protect Fixed Service ("FS"), FSS and other important existing operations. These conditions are feasible for deployment of lower power WLANs because such networks operate on non-interference basis but are not practical for commercial IMT networks. Commercially viable IMT deployments require exclusive access to spectrum and cannot avoid interfering with or tolerate interference from other, incumbent operations in the 6425-7125 MHz band. Noting ongoing international developments,^{18/} Wi-Fi Alliance respectfully asks the CA to consider that deploying a conventional wide area IMT-based cellular solution in the 6425-7125 MHz band would likely require relocation of incumbent FS and FSS operations in the band. Any such relocation of incumbent services, even if feasible, would require a significant effort for re-channelization/re-licensing/re-coordination, and significant expenditures.

For valid reasons, members of the Asia Pacific Telecommunity rejected proposals to consider IMT designation of the 6425-7025 MHz band in ITU Region 3 at the upcoming 2023 World Radiocommunication Conference.^{19/} And, Wi-Fi Alliance asks the CA to note that the European Electronic Communications Committee ("ECC") recently decided to initiate studies on the Wireless Access Systems including Radio Local Area Networks (WAS/RLAN) operations in the 6425-7125 MHz band.^{20/} Thus, while European regulators completed the initial step of opening the lower 6 GHz band (i.e., 5925-6425 MHz) for WLANs, this ECC decision confirms that a follow-up action is needed to address the projected Wi-Fi spectrum shortfall in the 6425-7125 MHz frequency band.

Conclusion

Policymakers worldwide recognize that wireless connectivity is increasingly dependent on Wi-Fi and that Wi-Fi delivers significant socioeconomic benefits. Regulatory harmonization is essential to ensuring necessary economies of scope and scale to enable commercially viable 6 GHz ecosystem in Hong Kong. As other countries (e.g., Brazil, Canada, South Korea, Saudi Arabia, US) move forward with WLAN deployments in 5925-7125 MHz, timely CA decision adopting similar regulatory framework is imperative to enabling wireless connectivity in Hong Kong. Conversely, lack of spectrum access (e.g., limiting WLAN access only to 5925-6425 MHz) may limit commercial viability of Wi-Fi ecosystem and its socioeconomic benefits in Hong Kong. The advantages of a globally harmonized spectrum include commonality of equipment, economies of scale, larger market, increased competition, lower product prices, and a wider choice of products, to name

^{16/} *Consultation*, Paragraph 17.

^{17/} See RKF Engineering study titled "Frequency Sharing for Radio Local Area Networks in the 6 GHz Band, January 2018") available at: <https://s3.amazonaws.com/rkfengineering-web/6USC+Report+Release+-+24Jan2018.pdf> ; also see CableLabs Study available at: <https://ecfsapi.fcc.gov/file/10212007172801/2021-02-12%20ATT%20NCTA%20Ex%20Parte--FINAL.pdf> ; also see ECC Report on Sharing and Compatibility Studies Related to WAS/RLANs in the frequency band 5925-6425 MHz, ECC Report 302, May 29, 2019 available at <https://docdb.cept.org/download/1396>

^{18/} *Consultation*, Paragraph 14.

^{19/} See Output of the 5th Meeting of APT Conference Preparatory Group for WRC-19, available at: <https://www.apf.int/2019-APG19-5> .

^{20/} See ECC Work Item on WAS/RLANs in 6425-7125 MHz, available at: http://eccwp.cept.org/WI_Detail.aspx?wiid=795

just a few. With a view towards international harmonization, Wi-Fi Alliance urges the CA to initiate regulatory action to expand WLAN operations in the 5925-7125 MHz band.

Wi-Fi Alliance appreciates the opportunity to contribute to the CA's efforts.

Respectfully submitted,

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WI-FI ALLIANCE

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