



Hewlett Packard Enterprise

19 November 2021

The Manager
Spectrum Planning Section
Australian Communications and Media Authority
PO Box 78
Belconnen ACT 2616

Re: Proposed updates to the LIPD Class Licence for 6 GHz RLANs

Dear ACMA,

HPE is one of the world's largest providers of managed wireless local area network ("WLAN" or "RLAN") infrastructure and is a global leader in the Wi-Fi equipment marketplace. HPE's Aruba business unit ships millions of indoor and outdoor Wi-Fi access points ("APs") every year, representing approximately 15% of the global market for such devices. We have been a top provider of WLAN equipment to Australian enterprises and service providers for nearly two decades. For example, Aruba has been the sole Wi-Fi supplier to the New South Wales Department of Education (DoE) since 2008, supporting its one-to-one initiatives in every elementary, middle and high school in that state.

HPE congratulates ACMA for its well-reasoned proposal to open the Lower 6 GHz band for Wi-Fi and other RLAN technologies in Low Power Indoor ("LPI") and Very Low Power ("VLP") modes of operation under an update to its LIPD Class License. We strongly support this proposal. HPE is also encouraged that ACMA is continuing to investigate Wi-Fi / RLAN operations in the Upper 6 GHz band, and also that ACMA is consulting on the need for "high power" and outdoor RLAN operations (aka "Standard Power"), perhaps in conjunction with an Automated Frequency Coordination ("AFC") system.

As HPE noted in our May 5th, 2021 response to ACMA's initial 6 GHz consultation, HPE supplies outdoor Wi-Fi solutions for a variety of mission critical deployment types in Australia, including the mining, petrochemical, logistics/shipping, healthcare, education (primary and secondary), sporting and other large public venue, municipal, and government agency sectors. As examples, here are a few leading Australian companies/entities (and HPE Aruba customers) whose outdoor connectivity needs will directly benefit from a high power and outdoor mode of operation in the 6 GHz band under a LIPD class license:

- a. Chevron Australia
- b. Pilbara Ports Authority
- c. Mid West Ports Authority
- d. SA Health
- e. James Cook University
- f. Sydney Showground Stadium (aka "Giants Stadium")
- g. Newcastle City Council



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In this matter, HPE has partnered with a broad group of equipment manufacturers, software makers, and internet service companies that are working together to make the 6 GHz band available for WLAN use ("the RLAN Group") around the world. HPE supports the comments filed by this group (the "Joint Filers"). In addition, HPE supports the comments of the Wi-Fi Alliance ("WFA") and the Dynamic Spectrum Alliance ("DSA") filed in response to this 6GHz consultation. We submit these individual comments to highlight issues where HPE has specialized insight and equities.

Please find on the following pages HPE's responses to the specific questions that ACMA posed in the consultation. If you have questions, please contact any of the HPE signatories below.

Sincerely,

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Lower 6 GHz band/proposed update to the LIPD Class Licence

1. Are the proposed out-of-band emission limits of -37 dBm/MHz for outdoor very low power (VLP) devices and -27 dBm/MHz for low power indoor devices suitable, both in terms of protecting intelligent transport systems (ITS) services and their effect on the operation of RLAN devices near/adjacent to the 5925 MHz boundary?

HPE Response:

HPE agrees with ACMA's proposal to require a -27 dBm/MHz out-of-band EIRP rolloff below the 5925 MHz band edge for Low Power Indoor (LPI) devices in order to protect adjacent band services. As ACMA notes, the ITS situation in Australia is more similar to the United States than Europe, and a consistent rolloff requirement between major markets such as Australia and the US will certainly aid equipment availability and time to market.

2. Is the specification of contention management protocols in the LIPD Class Licence necessary to enable equitable access between potentially competing technologies such as RLANs and 5G new radio-unlicensed (NR-U) services? If so, is the proposed condition, and the language used to express it, appropriate?

HPE Response:

HPE agrees with ACMA's proposal to require the use of contention-based protocols under the LIPD Class License for the 6 GHz band. HPE supports ACMA's neutrality principal for the various wireless technologies which may operate under the LIPD Class License, while also agreeing with ACMA's reasoning that in order to create a "level playing field" contention-based protocols such as CSMA/CA must be implemented.

HPE finds ACMA's proposed condition and suggested language appropriate and also consistent with the regulatory approaches to 6 GHz unlicensed / license exempt operations implemented in other leading countries.

3. Are there any broader comments on the proposed update to the LIPD Class Licence?

HPE Response:

While HPE believes that the 250 mW maximum EIRP ACMA has specified for Low Power Indoor operations will accommodate the majority of our Australian customers' indoor deployment requirements, there are cases where additional transmit power will be needed, such as warehouses, distribution centers, factories, and the like. HPE appreciates ACMA's commitment to continue considering the LPI experience in countries that have authorized higher EIRPs in order to assess if an increased maximum EIRP should be adopted for Australia in the future.

As discussed in our responses to the following section, HPE strongly encourages ACMA to extend the LIPD Class License to the Upper 6 GHz band and to authorize high power and outdoor operations under a Class License in conjunction with an AFC capability.



Upper 6 GHz band/higher power RLAN devices

As a general comment, HPE strongly agrees with ACMA's reasoning and judgement that the WRC-23 study items on the feasibility of IMT in 6 GHz (6425-7125 in ITU Region 1, and 7025-7125 MHz in all ITU regions) do not justify deferring action on the Upper 6 GHz band. HPE believes that the full 1200 MHz from 5925-7125 MHz is required in order for Wi-Fi and other technologies that operate under an LIPD Class License in Australia to continue to meet the increasing wireless services demands for the 2020-2030 timeframe. HPE commends the recent whitepaper from the Dynamic Spectrum Alliance, *6 GHz License Exempt: Why the full 1200 MHz and why now?*¹ which does a nice job laying out the range of reasons that the full 6 GHz band is needed for Wi-Fi and 5G NR-U, while the 3 GHz band (3100-4200 MHz) is, and should continue to be, the focus for mid-band IMT services for the next decade.

1. *Should the ACMA make arrangements that permit high-gain directional antennas (for example, for wireless internet service providers in remote areas) under a class licensing regime?*

HPE Response:

While HPE does not provide Wi-Fi solutions for the Fixed Wireless Access (FWA) market, we would recommend that ACMA enable these types of services in the 6 GHz band by permitting higher-gain directional antennas under the spectrum management of an Automated Frequency Coordination ("AFC") system. As regional and rural access continues to be both a priority and challenge in Australia, HPE supports the use of higher power / high gain / directional point-to-point and point-to-multipoint wireless systems in the 6 GHz band under the coordination of an AFC system. These systems can effectively "extend the reach" of fixed fibre and copper broadband networks, in the same way that 2.3 GHz LTE has been used to broaden the coverage of the NBN. In addition to residential broadband, rural business uses such as agriculture and mining would benefit from these types of systems.

One of the advantages of an AFC-coordinated approach would be the flexibility in rules that can be accommodated by a geolocation aware database. For instance, ACMA could mandate geographic restrictions on such high-gain / directional fixed wireless operations, perhaps limiting them to rural areas. Because the base station / access point can be required to register both its model number and geographic location to the AFC, the AFC could ensure that these systems are only authorized in designated areas.

HPE would also note that a potential peculiarity of AFC-coordinated pt-pt or pt-mp systems is the possible need for the remote node (base station) to "close the link" with the master or root node (base station) prior to registering and being fully authorized by the AFC. There are a number of ways to address this (such as the US FCC's "CPE-CBSD" approach for fixed wireless services in the 3.5 GHz CBRS band), but ACMA should keep this in mind.

¹ <http://dynamicspectrumalliance.org/wp-content/uploads/2021/08/6GHz-License-Exempt-Band-Why-1200-MHz-and-Why-Now.pdf>



2. If 'high power' class-licensed devices were to be introduced under an AFC system, what aspects of the system would need to be considered in setting it up? Is there interest from industry in administering such a system?

HPE Response:

On October 5th, 2021 HPE announced a strategic partnership with Federated Wireless, whereby Federated will provide the AFC and Local/Light Licensing database coordination services necessary for the 'high power' and outdoor mode of operation (i.e. "Standard Power" under the US FCC and Canadian ISED rules) of HPE's Aruba portfolio of Wi-Fi Access Points.² As noted previously in this response, and in our May 2021 response, HPE strongly supports the introduction of higher power and outdoor 6 GHz Wi-Fi solutions to the Australian market, where there is a keen need for such services. HPE would enable the Australian market for higher power and outdoor Wi-Fi in close cooperation with our partner, Federated Wireless, and we will defer to Federated on some of the specific questions that ACMA has raised regarding AFC business models and operations.

3. If 'high power' class-licensed devices were to be introduced under an AFC system:
- Is there interest from industry in administering such a system?
 - Are there any impediments to developing and/or operating a system in Australia? What could be done to help enable, or otherwise encourage, the development and/or operation of a system in Australia?
 - To what extent would an Australian system need to be aligned with those to be implemented elsewhere? What scope could there be for customisation in an Australian system?
 - What aspects of an AFC system would need to be considered in the design, establishment, and ongoing operation, of such a system, including:
 - regulator and industry commitments
 - technical spectrum coordination and coexistence rules – for example, a tiered hierarchy framework for spectrum uses
 - IT infrastructure and system design, including security and system reliability issues
 - communication interfaces between an AFC system, the ACMA's Register of Radiocommunications Licences (RRL) and devices
 - ongoing interaction between the ACMA and system operators

HPE Response:

HPE supports the comments of Federated Wireless in regard to the business model and regulatory aspects of AFC system operation. HPE has been a leader in developing and standardizing AFC and Standard Power devices in industry organization such as the Wi-Fi Alliance and the Wireless Innovation Forum ("WInnForum").

HPE would note that significant progress has been made in the areas of AFC standardization and development for the US market. In fact, the US FCC has recently adopted a Public Notice detailing the process it will use to authorize AFC systems³. Proposals from prospective AFC

² <https://blogs.arubanetworks.com/corporate/aruba-and-federated-wireless-partner-to-deliver-outdoor-and-higher-power-wi-fi-6e-with-afc/>

³ <https://docs.fcc.gov/public/attachments/DOC-375609A1.pdf>



System operators are due to the FCC by November 30th, 2021, and HPE believes there will be a strong industry response to the FCC proceeding.

Also of importance are the enabling AFC working programs and resulting deliverables of the Wi-Fi Alliance⁴ and WInnForum⁵.

The Wi-Fi Alliance:

- has defined the message types that will be used between the AFC and the Standard Power access point,
- has defined an authorization test framework whereby the AFC and Standard Power access point may be independently tested for proper function as a System Under Test (“SUT”) and Device Under Test (“DUT”) respectively via standardized test harnesses, and,
- is defining the test cases that could be utilized to certify both AFC and Standard Power access points utilizing the testing framework mentioned above.

The WInnForum 6 GHz committee has the following activities in progress:

- enumerating and defining AFC system requirements,
- general description of the AFC incumbent protection contour calculation,
- evaluation of static parameters/inputs to the protection contour calculation, and,
- procedures for identifying and correcting erroneous incumbent information in the US FCC’s Universal Licensing System (“ULS”) database.

While this last WInnForum activity is specific to 6 GHz in the US, the vast majority of these industry efforts and work products are easily transferable to an AFC implementation for Australia and could be leveraged to quickly enable “high power” (i.e. Standard Power) operation. An HPE technologist is a Vice-Chair of the Wi-Fi Alliance AFC Task Group and HPE is also a member of the WInnForum 6 GHz Steering Group. We stand ready and eager to assist ACMA in further defining the rules and developing an authorization program for AFC and high power / outdoor Class license operations for Australia.

4. *If ‘high power’ devices were to be introduced under a manual registration process, what might those arrangements look like? Would the introduction of apparatus licensing for such devices be an appropriate option?*

HPE Response:

HPE strongly encourages ACMA to authorize “high power” and outdoor 6 GHz devices (“Standard Power” devices) in conjunction with an AFC system under a class-licensed approach. This would provide the maximal flexibility that is achievable with geolocation-aware database coordination. It would also make it far easier for new fixed microwave links to be licensed and deployed as the AFC system can factor those into its coordination and authorizations. AFC will be used for 6 GHz Standard Power operations in the US, Canada,

⁴ [https://www.wi-fi.org/who-we-are/current-work-areas#Automatic%20Frequency%20Coordination%20\(AFC\)](https://www.wi-fi.org/who-we-are/current-work-areas#Automatic%20Frequency%20Coordination%20(AFC))

⁵ <https://6ghz.wirelessinnovation.org/>



Republic of Korea, and other major countries, and should be viewed as the default option to enable these types of high power and outdoor services.

In the event that ACMA were to pursue a manual registration/coordination process under something like an apparatus license (which we do not think is the optimal approach), HPE would make the following recommendations:

- a. To the extent possible, the information contained in a 6 GHz apparatus license (i.e. “light license”) should be expressed in formats consistent with those defined by the Wi-Fi Alliance for AFC support. For instance, HPE recommends that the geographic area(s) covered by the apparatus license be expressed by ACMA in a manner that can be easily expressed as one of the three formats standardized in the Wi-Fi Alliance’s AFC System-to-Device Interface (SDI) specification. Other information that has been standardized for the AFC system to device interface which HPE believes could be applicable and easily included in an ACMA apparatus license for high power and outdoor (“Standard Power”) operations in 5925-7125 MHz include indoor/outdoor classification and antenna maximum height above ground level.
- b. HPE believes that it would be highly beneficial to define a standardized, machine-readable structure for any 5925-7125 MHz apparatus license and operational parameter data (e.g. a relatively simple JSON structure), which could be issued by ACMA, along with the apparatus license. The licensee could then easily upload this apparatus license data to one or more Light Licensing Databases (LLDBs) which HPE and other infrastructure vendors could use to confirm Standard Power operations for our devices. HPE would be pleased to work with ACMA, industry organizations, and other industry players on the definition of such a standardized data structure.

5. Would there be advantages in implementing different licensing and/or access management arrangements in different geographic areas for the use of high power RLAN devices?

HPE Response:

HPE strongly supports a single access management/coordination approach for all high power and outdoor (i.e. Standard Power) RLAN devices in the 6 GHz band across Australia under a class-licensed arrangement. As noted previously, an AFC system could be configured to authorize varying operational characteristics (e.g. maximum EIRP or higher gain directional antennas) in different geographic areas due to the requirement that the high power (i.e. Standard Power) devices report their model information and geolocation to the AFC system.

6. Are there additional sharing scenarios and/or studies relevant to this band that have not been identified in this paper?

HPE Response:

Not that we are aware of. HPE believes ACMA has comprehensively and thoroughly accounted for the relevant studies and reports.



5 GHz band

1. In addition to comments made to the April 2021 consultation paper, do you have any comments on the other proposals for updates to the 5 GHz band listed in this paper?

HPE Response:

As HPE has noted in our responses to the 6 GHz sections of this consultation, there is a strong demand for high power and outdoor services in Australia. Accordingly, we strongly support some of the updates to the 5 GHz band that ACMA notes were expressed during its earlier consultation, specifically that:

- the maximum EIRP in the 5150-5250 MHz range be increased to 36 dBm (4 Watts), and,
- that outdoor operation be permitted in the 5250-5350 MHz range.

2. If outdoor and/or higher power RLAN devices were authorised in parts of the 5 GHz band (for example, 5150–5250 MHz), would it be appropriate to implement measures similar to those being considered for high power devices in the 6 GHz band (for example, a registration system, or apparatus licensing)?

HPE Response:

HPE does not believe that it would be appropriate to implement similar incumbent protection and access management regimes for both the 5 GHz and 6 GHz bands for the following primary reasons:

- The incumbent situation is dramatically different between the 5150-5250 MHz and the 5925-7125 MHz frequency ranges, the presence of Fixed Service (FS) links in 6 GHz being the largest variance. Applying outdoor / high power 6 GHz protection requirements to 5 GHz would be onerous, and applying outdoor / high power 5 GHz protection requirements to 6 GHz would likely not prove sufficient to protect incumbent terrestrial services.
- Harmonization between major markets (such as Australia, the US, Canada, and Republic of Korea) is critical to achieving a vibrant mass market and the resulting beneficial economics. Neither the US nor Canada have required AFC-type coordination for outdoor operation in 5 GHz, while both have standardized on AFC coordination for Standard Power (outdoor and higher power) operation in the 6 GHz band. HPE strongly encourages ACMA to harmonize on these approaches unless there is very good justification to implement a different management regime in either band.
- There is no requirement for a geolocation capability for higher power and outdoor operation in the 5150-5350 MHz frequency range, which is a requirement for AFC-type coordination.

In the event, that ACMA believes there is a need to track substantial deployments of outdoor Wi-Fi systems in the 5150-5250 MHz band, the ISED Canada registration requirement for outdoor deployments above a specified number of Access Points (APs) could be implemented.



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3. If high power devices were to be authorised in both the 5 GHz and 6 GHz band, would it be appropriate to use the registration/authorisation method and system for both?

HPE Response:

Please see HPE's comment above regarding its strong preference for separate, tailored approaches to high power and outdoor RLAN operations in the 5 GHz and 6 GHz bands for Australia, consistent with the existing international approach for 5 GHz and the emerging AFC approach for 6 GHz.