

May 6, 2022

Five Year Spectrum Outlook
AUSTRALIA

Re: Apple, Broadcom, Cisco, Google, HPE, Intel, Meta Platforms, Microsoft, Qualcomm and Dynamic Spectrum Alliance joint Submission to the ACMA's Five-Year Spectrum Outlook.

Apple, Broadcom, Cisco, Google, HPE, Intel, Meta Platforms, Microsoft, and Qualcomm and the Dynamic Spectrum Alliance consider that a main priority for the Five-Year Spectrum Outlook should be to make spectrum bands available to create an environment that facilitates and accelerates digital transformation. To do so, the focus should be delivery of spectrum for all services and systems that provide digital transformation, including Wi-Fi, and not focused on or limited to any one technology.

The aforementioned companies and the Dynamic Spectrum Alliance appreciate the opportunity to respond to the ACMA's Five-Year Spectrum Outlook consultation. We are available to discuss these comments, or to provide additional information, should you have any questions.

Yours sincerely,

Apple,
Broadcom, Inc.,
Cisco Systems, Inc.,
Google,
Hewlett Packard Enterprise,
Intel Corporation,
Meta Platforms Inc. (formerly Facebook, Inc.),
Microsoft,
Qualcomm Incorporated,
Dynamic Spectrum Alliance

COMMENTS TO THE PUBLIC CONSULTATION

Recent Update to the LIPD for 6 GHz.

Apple, Broadcom, Cisco, Google, HPE, Intel, Meta Platforms, Microsoft, and Qualcomm ('Companies') and the Dynamic Spectrum Alliance ('DSA'¹) welcome the recent announcement that the 5925–6425 MHz frequency band (the 'lower 6 GHz band') will be added to the Low Interference Potential Devices (LIPD) Class Licence for use by RLAN and other innovative devices. This band will go some way to enabling more reliable Wi-Fi communications and help ease congestion in the lower bands for both Wi-Fi and the myriad of other devices that use the band or indeed are currently under development.

The Companies and DSA also note the ACMA's stated inclination for the upper part of the band (6425 – 7125 MHz, the Upper 6 GHz Band), reproduced below:

ACMA response to upper 6 GHz.

We see strong arguments for the introduction of arrangements for RLANs across the entire 6 GHz band, and do not believe that waiting for the outcomes of WRC-23 agenda item 1.2 is itself a valid reason to defer a decision on the upper 6 GHz band (especially given that it is only considering 100 MHz from the band in our region).

However, we also note that future use of the upper band will be better informed by a range of international harmonisation, equipment standardisation and demand developments that are yet to occur. These include possible future changes to spectrum management arrangements supporting wireless broadband uses (including for IMT technology), as well as the standardisation timeframe for RLAN technologies for which the upper 6 GHz band is expected to be most critical. In particular, the IEEE 802.11be standard ('Wi-Fi 7') is not expected to be finalised until 2024.

DSA and the Companies Comment on the ACMA Statement.

The Companies and DSA agree with the ACMA that there are very strong arguments for the release of the upper 6 GHz band to RLAN and other devices, and believe that those arguments lead to a conclusion that this should occur as soon as possible.

The ACMA correctly states that only 100 MHz is under consideration for IMT in Region 3 within this band. This amount, when compared to the large amounts of mid-band spectrum being released or investigated between the 3.4 and 4.2 GHz band under the ACMA's world-leading planning, would not in the Companies' and DSA's views deliver economic benefits close to those delivered

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

by utilising the entire 1200 MHz for RLAN. While the arguments for additional mid-band spectrum in the 3.4 – 4.2 GHz range are strong, there is no comparable argument for the upper 6 GHz band.

Sharing With Other Services.

In the case of the sharing studies, it is obvious that a secondary service utilising Automatic Frequency Coordination would be able to operate in harmony with other services, such as MSS Feeder Links, Fixed Links, and (by way of the secondary status of RLAN) FSS Uplinks. Even with standard power, the sharing scenario between terrestrial uses and FSS space receivers remains relatively unchanged. However, the FCC has adopted an effective EIRP mask that the Companies and DSA believe will give the FSS community comfort that standard power RLAN will not adversely affect their space receivers:

(4) For a standard power access point and fixed client device operating in the 5.925 - 6.425 GHz and 6.525 - 6.875 GHz bands, the maximum power spectral density must not exceed 23 dBm e.i.r.p in any 1-megahertz band. In addition, the maximum e.i.r.p. over the frequency band of operation must not exceed 36 dBm. For outdoor devices, the maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

The contention within the ITU and APT study groups on this issue shows that this is not the case between these services and IMT. Therefore, the Companies and DSA believe that to maximise economic benefit from sharing spectrum, allocating the Upper 6 GHz band to RLAN is plainly the optimum outcome. The Companies and DSA submit that when these studies are examined it is clear that the best shared outcome is with RLAN.

Maximising Economic Benefit.

While releasing the Lower 6 GHz will undoubtedly provide significant economic benefit, the Companies and DSA are concerned that a split allocation may hamper development of RLAN systems and other innovation that will wish to move into the band.

RLAN is a technology vital to communications connectivity in Australia. In universities, on mine-sites, around large farms, and, indeed, in communities, RLAN systems based on Wi-Fi have changed the way Australians connect. However, these bands have also provided SCADA systems, RPAS Remote Control and Video Monitoring, and stress monitoring of bridges, transport infrastructure, vehicles, livestock and more. The Companies and DSA are concerned that splitting the band will inhibit the deployment in Australia of new technologies originating in countries that have released the entire 1200 MHz of the 6 GHz band for RLAN use, and will hold back homegrown innovation by preventing people and researchers from inventing new systems for use in the band.

Even in an automated mine environment, where there is no doubt the Lower 500 MHz will help reduce interference, the Companies and DSA believe that incoming sensor, system, and controller technologies will soon be vying for use of the spectrum, and other systems designed for the upper 700 MHz will be temporarily blocked from entry.

Given the very large amount of mid-band spectrum available available to IMT in bands other than 6 GHz, and which is ideally suited to IMT, the Companies and DSA submit that the maximum economic benefit from the use of the band will come if the entire 1200 MHz of the 6 GHz band is released in 2022 for RLAN use. Key elements of the Wi-Fi 7 standard, which builds on the benefits of Wi-Fi 6E and assumes 1200 MHz of spectrum availability, are now stable; chipsets have

already been announced, and end product are being developed and introduced into the market². Operators and enterprises are now developing their roadmap based up equipment availability and regulatory outlook. Delay in allocation of the upper 700 MHz will postpone the benefits of these new technologies for wireless broadband, businesses, consumers and overall innovation in Australia.

Conclusion

The IMT community in Australia benefits from the forward planning the ACMA started nearly 20 years ago in the 3.4 – 4.2 GHz bands. Indeed, IMT in Australia has more access to mid-band spectrum than almost any other comparable country. The sharing issues with IMT are fraught. Even satellite service providers have stated a preference to share with RLAN systems. While some may exercise their prerogative to change their positions during the spectrum debate, some carriers are already advertising a 6 GHz Wi-Fi product. In short, the small incremental benefit from an additional 100 MHz of IMT spectrum pales into insignificance when compared with the benefits to be derived from using the full band for RLAN and other LIPD devices.

The Companies and DSA believe that to maximise early service delivery, to massively increase productivity by opening up new opportunities for mine and farm automation, and to turbo-charge domestic innovation, releasing the full 1200 MHz to RLAN use in 2022 is the right decision.

² See “Broadcom Announces Availability of World’s First Wi-Fi 7 Ecosystem” available at <https://www.broadcom.com/company/news/product-releases/60186>; and “Qualcomm Extends Connectivity Leadership with World’s First and Fastest Wi-Fi 7 Commercial Solution” available at <https://www.qualcomm.com/news/releases/2022/02/28/qualcomm-extends-connectivity-leadership-worlds-first-and-fastest-wi-fi-7>; and “Mediatek leads in pervasive wireless connectivity with advanced Filogic Wi-Fi 7 technology” available at <https://corp.mediatek.com/news-events/press-releases/mediatek-shows-the-worlds-first-live-demos-of-wi-fi-7-technology-to-customers-and-industry-leaders>.