Cambium Networks

WLAN use in the 6GHz band in NZ
Discussion paper
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1 EXECUTIVE SUMMARY

The Cambium Networks team covering Australian, New Zealand and the Pacific Islands, appreciates the opportunity to submit a response to the *Discussion document, WLAN use in the 6GHz band in New Zealand*.

Cambium Networks empowers millions of people with wireless connectivity worldwide. Our wireless portfolio is used by commercial and government network operators as well as broadband service providers to connect people, places and things. With a single network architecture spanning fixed wireless and Wi-Fi, Cambium Networks enables operators to achieve maximum performance with minimal spectrum. End-to-end cloud management transforms networks into dynamic environments that evolve to meet changing needs with minimal physical human intervention. Cambium Networks empowers a growing ecosystem of partners who design and deliver gigabit wireless solutions that just work.

Cambium Networks is committed to supporting Wi-Fi 6E standard, and will start to deliver products that will support the extended WiFi 6GHz band towards the end of the year. We will start to ship both Wi-Fi APs and Fixed Wireless products that will be able to use this band, We are excited that the MBIE (RSM) have plans to make the lower 500MHz of this band available in NZ.

2 INTRODUCTION

2.1 INTRODUCTION TO CAMBIUM NETWORKS

At Cambium Networks, we support the communications of life for millions of people around the world and connect enterprise networks where other options cannot. No matter what the conditions or locations, wherever people or networks need to be connected, our wireless broadband solutions deliver clear voice, data and video communications people and networks can rely on.

Our Mission is Connecting the Unconnected and delivering solutions and technology that Bridge the Digital Divide.

Cambium Networks provides professional grade fixed wireless broadband, microwave, narrowband IoT and Enterprise indoor and outdoor Wi-Fi networks . Our solutions are deployed in tens of thousands of networks in over 150 countries, with our innovative technologies providing reliable, secure, cost-effective connectivity that's easy to deploy and proven to deliver outstanding performance metrics. To date Cambium Networks has delivered over ten million radio devices, a count that continues to accelerate year-over-year.

Cambium Networks are proven, respected leaders in the wireless broadband industry. We design, deploy and deliver innovative data, voice, and video connectivity solutions, through a qualified channel of distributors, Wireless Internet Service Providers, Telecommunications Companies, Value Added Resellers and System Integrators. Our solutions enable and ensure the communications of life, empowering personal, commercial, and community growth virtually everywhere in the world.

Indoor and outdoor Enterprise Wi-Fi technology from Cambium Networks is used in K12 and higher education, MDU, hospitality, large public venues, public Wi-Fi hotspots, retail, warehousing, and enterprise networks. Following ten-years as a business unit within Motorola Solutions, Inc. Cambium Networks was established in 2011 following divesture from Motorola Solutions.

2.2 WHAT IS FIXED WIRELESS?

Key to understanding the value of the Fixed Wireless portfolio, is understanding how it is different from and should not be confused with Mobile Broadband (MBB).

Mobile Broadband is synonymous with the networks that support mobile UE and are designed and built with that in mind.

Whilst similar in many respects, our Fixed Wireless broadband solutions, are optimised to provide the best results for delivery of fixed data services using harmonized RF bands. The typical application for Fixed Wireless is to provide a fixed data service using RF, when the use of fiber or copper are not possible, suitable, available or affordable.

Mobile Broadband provides data connectivity for mobile User Devices whilst Fixed Wireless Broadband (FWBB) connectivity to a site where a fixed installation module (SM) is installed. The SM uses Gigabit Ethernet to connect to inside Ethernet switches or directly to a Wi-Fi access point. in a FWBB network, the client devices connect to broadband via Ethernet or Wi-Fi edge technology.

3 RESPONSE TO QUESTIONS SPECIFIC TO OPTIONS PRESENTED.

3.1 Q1. DO YOU AGREE WITH RSM'S PROPOSAL ON MAKING THE 5925 - 6425 MHZ AVAILABLE FOR WLAN USE?

Yes. The proposed rules will allow this spectrum to be shared with incumbent licensed use in the same band. This sub band is also called U-NII-5

3.2 Q2. WHAT ARE YOUR VIEWS ON THE POTENTIAL FUTURE USE OF 6425 - 7125 MHZ FOR NEW APPLICATIONS (E.G. WI-FI OR IMT)?

After reviewing the proposed and adopted rules by other regulatory domains, careful rules will allow the use of the remaining U-NII-6 through U-NII-8 sub bands. The proposed and adopted rules will restrict some use cases but generally allow use of these frequencies for Wi-Fi. For example, restricting use of ad-hoc protocols is a reasonable restriction that will allow these frequencies to be used in a prescriptive manner. Cambium products will support entire 5925 - 7125 MHz band. That allows to operate in additional sub bands approved by RSM in the future.

3.3 Q3. DO YOU AGREE THAT RSM SHOULD INCLUDE 5925 - 6425 MHZ IN THE GURL-SRD FOR WLAN LOW POWER INDOOR AND VERY LOW POWER USE?

Yes, we agree, the proposed and adopted rules by other regulatory domains provide reasonable restrictions on indoor low power W-Fi networks. Very low power indoor applications are not obvious at this time.

3.4 Q4. DO YOU AGREE THAT RSM SHOULD MANDATE ETSI EN 303 687 AS THE RADIO STANDARD FOR WLAN USE IN THE 6 GHZ BAND? IS THERE ANY OTHER REGULATORY COMPLIANCE STANDARD WE SHOULD CONSIDER?

Consider both US-FCC and ETSI EN 303 687 when evaluating a standard set of rules. Each of these address the same issues, but each has evaluated use cases in their specific domains. New Zealand should select the set of rules that best match the use cases and incumbent licensed users in New Zealand. It may also be true that New Zealand has a different set of impact, so evaluation of each is necessary. Cambium products will be certified to support both ETSI and FCC standards and in turn we will do DoC for R-NZ compliance.

3.5 Q5. WHAT ARE YOUR VIEWS ON USING A LICENSING APPROACH TO SUPPORT 30 DBM EIRP WLAN DEVICES?

Wi-Fi network designers and administrators have used unlicensed spectrum for over 25 years, and are mentally attuned to unlicensed spectrum. Requiring licenses for indoor Wi-Fi networks will be difficult, slow down deployments and may lead to attempts to 'game' the system and avoid the license requirement. On a technical note, 30dBm is very usable power for a high density indoor network. Client devices are typically much lower due to physical constraints of the design, so having a reasonable unlicensed spectrum at 30dBm is very usable.

3.6 Q6. WHAT ARE YOUR VIEWS ON SUPPORTING 36 DBM EIRP STANDARD POWER DEVICES USING AUTOMATIC FREQUENCY COORDINATION (AFC) SYSTEM? DO YOU HAVE ANY PROPOSALS TO PROVIDE AFC SYSTEMS TO NEW ZEALAND?

The proposed AFC system is superior to the current mode used for DFS/TPC channels in the 5GHz band. In the 5GHz band, the AP is required to detect a radar pulse as short as 0.5us. However, this is an order of magnitude shorter than the AP is normally operating. The result is many false positives and complication in the AP design and network topology design. The proposed AFC system has three obvious benefits:

1. Flow-through approval. Starting from the central database → AP → client.
2. Avoids false positives and network interruptions often associated with DFS radar pulse detection
3. Deterministic network control and central reporting

It will be both important and valuable to make the expanded 6GHz spectrum available for outdoor Fixed Wireless use. Cambium will have products that will be able to operate at 36dBm (4 Watts) and support 6GHz AFC. Integrated geolocational capability supported by Cambium Wi-Fi 6E outdoor products eliminate a need in professional installation.

3.7 Q7. ANY OTHER COMMENTS?

RSM can consider allowing higher power point-to-point operation in the U-NII-5 band similar to FCC rules for the U-NII-1 and U-NII-3 bands. These rules establish a maximum conducted power level of 30 dBm (1 Watt) but allow higher than 6 dB antenna gain in point-to-point operation without reducing transmitter power, thereby permitting point-to-point transmitters to have a maximum EIRP of 53 dBm. That can benefit rural deployment by making additional unlicensed spectrum available for backhaul and internet connectivity.