Response of IEEE 802 LAN/MAN

Introduction

IEEE 802 LMSC is a leading consensus-based industry standards body, producing standards for wireless networking devices, including wireless local area networks ("WLANs"), wireless specialty networks ("WSNs"), wireless metropolitan area networks ("Wireless MANs"), and wireless regional area networks ("WRANs"). We appreciate the opportunity to provide these comments to MCMC.

IEEE 802 is a committee of the IEEE Standards Association and Technical Activities, two of the Major Organizational Units of the Institute of Electrical and Electronics Engineers (IEEE). IEEE has about 420,000 members in about 190 countries and supports the needs and interests of engineers and scientists broadly. In submitting this document, IEEE 802 acknowledges and respects that other components of IEEE Organizational Units may have perspectives that differ from, or compete with, those of IEEE 802. Therefore, this submission should not be construed as representing the views of IEEE as a whole[1].

Per request from MCMC's consultation on WRC-19 views and positions, IEEE 802 LAN/MAN Standards Committee (LMSC) respectfully submits its views of WRC-19 Agenda Items to MCMC for their consideration, please see below.

No.	Agenda Item	Proposed Malaysia (MLA) Views and Positions
Working Party 1: Land Mobile and Fixed Services		
1.	1.11	
2.	1.12	IEEE 802.11 has provided the wireless standard (IEEE Std 802.11p-2010) that provides the basis for much of the Intelligent Transport Systems (ITS) Vehicle-to-Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) technologies being deployed today. And now IEEE 802.11 is specifying an IEEE Next Generation V2X (NGV) amendment (the P802.11bd project) backward compatible to IEEE Std 802.11p-2010. We believe that these technologies are capable of sharing frequency bands, including the 5850-5925 MHz, with other unlicensed applications. We also understand that global harmonization of the technology is a notable effort that would enable technology improvements and cost reductions to better address rapid adoption to meet the ITS safety goals, an effort we would support.

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[1] This document solely represents the views of the IEEE 802 LAN/MAN Standards Committee and does not necessarily represent a position of either the IEEE, the IEEE Standards Association or IEEE Technical Activities.

No.	Agenda Item	Proposed Malaysia (MLA) Views and Positions
3.	1.14	
4.	1.15	The recently published Std. IEEE 802.15.3d-2017 targets point-to-point links in the frequency range of 252 to 325 GHz.

All technical and operational parameters for LMS and FS have been sent to ITU-R WP 5A and 5C and are considered in the reports ITU-R F.2416 and M.2417 for AI 1.15.

Within IEEE 802 one input document on sharing studies between FS and EESS has been discussed (https://mentor.ieee.org/802.15/dcn/19/15-19-0095-00-0thz-h2020-thor-initial-results-on-sharing-studies.pdf), showing that sharing between FS and EESS is possible in the bands 275-296 GHz, 306-313 GHz, 319-333 GHz and 354-450 GHz. In May 2019, WP 1A finished the draft new Report ITU-R SM.[275-450GHZ_SHARING] which was adopted by SG 1 in June 2019 for AI1.15.

Different sharing studies have been performed showing slightly different results. However, consensus among all the studies, including the one presented in IEEE 802 and mentioned above is that the following frequency bands could be used by FS/LMS applications without specific conditions, while maintaining the protection of the passive services:
275-296 GHz, 306-313 GHz, 320-330 GHz and 356-450 GHz.

With a look at the study results in the PDNR ITU-R SM.[275-450GHZ_SHARING], our understanding is:

- Sharing with RAS is possible (maybe with exclusion zones or avoidance angles in the vicinity of a RAS site).
- FS operating in the bands 296-306, 313-318 and 333-356 GHz would cause harmful interference to the EESS.
- For LMS, one study shows harmful interference to EESS in the bands 296-306, 313-320 and 330-356 GHz. Another study shows compatibility of CPMS with EESS in the range 275-325 GHz.

Taking this into account, we believe that the identification (by a new footnote or modification of the existing one RR No. 5.565) of at least the bands 275-296, 306-313, 320-330 and 356-450 GHz for LMS and FS will provide proper protection of the passive services. As an improvement to the current situation, this identification will provide clear guidance to manufacturers and administrations which bands should not be used in order to protect the passive services.

We believe that the identification of these bands is very important today for backhaul and fronthaul links supporting 100+ Gbit/s

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		for 5G and enables future applications such as kiosk downloading, reconfigurable wireless links for data centers in addition to fibers and intra-device communications.
		However, IEEE 802 has a process to revise IEEE Std 802.15.3 according to the outcome of WRC-19 if necessary and may also develop a standard for bands above 325 GHz which were less promising in 2014 when the development of the standard was initiated.
Working Party 2: Broadband Applications in the Mobile Service		

5.	1.13	IEEE 802 respectfully requests MCMC to reconsider its position on item vii (66-71 GHz band) of supporting IMT designation for this band.
		
		  IEEE 802 strongly supports 66-71 GHz band for unlicensed operation. This position is primarily based on the following developments, actions and reasoning:
		
		  o On July 14, 2016, U.S. Federal Communication Commission (FCC) published a Report and Order and Further Notice of Proposed Rulemaking (FCC 16-89) [https://apps.fcc.gov/edocs_public/attachmatch/FCC-16-89A1.pdf] to adopt 64-71 GHz band for unlicensed operation.
		
		  o In January 2018, the ITU-R published Recommendation M.2003-2 [https://www.itu.int/rec/R-REC-M.2003-2-201801-I/en] wherein this band was indicated for Multigigabit Wireless Systems. This facilitates the introduction of IEEE 802 technologies that are capable of supporting 5G use cases under the existing Mobile Allocation.
		
		  o In February 2018, the Radio Spectrum Policy Group of the European Union (RSPG) published their Second Opinion on 5G [http://rspg-spectrum.eu/2018/02/] in which they recommended making this band available on a general authorized access basis.
		
		  We believe that a wide variety of 5G services and use-cases will be deployed in this band globally without the need for an IMT identification. Wi-Fi®[2] plays an important role in and is an integral part of 5G. 5G will be driven by new IEEE 802 wireless technologies not only in the sub-6 GHz spectrum such as IEEE P802.11ax and IEEE P802.11be, but also others in the mmWave spectrum such as IEEE Std 802.11ad, IEEE P802.11ay and IEEE Std 802.15.3. We are concerned

[2] Wi-Fi® is a registered trademark of the Wi-Fi Alliance.

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		that IMT identification could bar some key 5G technologies like these from operating in this band. IEEE 802 recommends supporting CPM-19 Report Method J1 (Section 2/1.13/4.10.1) and would like to respectfully request MCMC to do the same.
6.	1.16	Since the 1990s, IEEE 802 has been actively developing standards for Wireless LAN technologies that operate in the 5 GHz bands. Among these is IEEE 802.11, which is the basis for Wi-Fi, the most successful, most used and most demanded 5 GHz wireless technology. IEEE 802.11 is carrying the vast majority of wireless internet traffic and is essential for commercial services, education, communications and social interactions, creating industries and providing jobs and economic growth around the world. IEEE 802 recommends that any regulatory action should not disadvantage any IEEE 802 standard or add further regulatory burden for their use in the 5 GHz bands. Specifically, we strongly recommend refraining from imposing additional regulatory constraints such as DFS, transmit power, and indoor restrictions in the 5725-5850 MHz band. Moreover, while IEEE 802 appreciates MCMC's position to support outdoor operation in the 5150-5250 MHz band, we recommend the MCMC to harmonize the technical rules with FCC (FCC rule 15.407) on the transmit power limit for outdoor use of RLAN equipment such as Access Points and mobile/portable client devices while protecting incumbent services.
7.	9.1 (Issue 9.1.1)	
8.	9.1 (Issue 9.1.5)	In preparation for WRC-15 and WRC-19, ITU-R carried out a significant amount of work to study coexistence between RLANs and new radar systems, such as bi-static and fast frequency-hopping radars. These studies confirm that the technical and regulatory impacts of requiring the mobile service to protect new radars types would impose undue constraints on RLAN operation in the 5250-5350 MHz and 5470-5725 MHz frequency ranges. The reference to ITU-R M.1638-0 should not be updated to ITU-R M.1638-1 in footnotes RR Nos. 5.447F and 5.450A. Given that both ITU-R M.1638-0 and M.1849-1 Recommendations require essentially the same protection requirements, adding a new reference to ITU-R M.1849-1 is redundant and unnecessary. IEEE 802 agrees with MCMC in supporting long-term solution that requires less regulation should Recommendations ITU-R M.1638 or M.1849 be updated again in the future. For that reason, IEEE 802

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		recommends supporting CPM-19 Report Approach B (Section 2/9.1.5/4.2) to update both footnotes by removing the references to the Recommendations and replacing them with a reference to RR No. 5.446A.	
9.	9.1 (Issue 9.1.8)		
Working Party 3: Satellite Services			
10.	1.4		
11.	1.5		
12.	1.6		
13.	7	A	
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13.	7		
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14.	9.1 (Issue 9.1.2)		
15.	9.1 (Issue 9.1.3)		
16.	9.1 (Issue 9.1.9)		
Working Party 4: Science Services			
17.	1.2		
18.	1.3		

Submission

No.	Agenda Item	Proposed Malaysia (MLA) Views and Positions
19.	1.7	
Working Party 5: Maritime, Aeronautical and Amateur Services		
20.	1.1	
21.	1.8	
22.	1.9.1	
23.	1.9.2	
24.	1.10	
25.	9.1 (Issue 9.1.4)	
Working Party 6: General Issues		
26.	2	
27.	4	
28.	8	
29.	9.1 (Issue 9.1.6)	
30.	9.1 (Issue 9.1.7)	
31.	10	**Agenda Item 10, Re: TV White Space** There is an interest from regulators and other stake holders to provide cost-effective broadband connectivity to their masses. Problems are especially severe in Rural Areas. TV White Space based communications may be used to connect the un-connected due to their favorable propagation characteristics. The TV White Space eco-system would like to initiate a study at the WRC-23 to investigate if the Radio Regulations can accommodate:

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		• 54-88 MHz, 172-216 MHz, 470-585 MHz for terrestrial broadcast services with secondary operation by whitespace devices on a non-interfering basis, • Or Co-primary use of terrestrial TV Broadcast services with whitespace devices. **Agenda Item 10, Re: Proposal Seeking IMT Identification in 6 GHz Band** In Public Consultation, Malaysia's view was that "proposals for agenda item 10 could be supported subject to compatibility with existing services". IEEE 802 has serious concern about a proposal to include an agenda item for WRC-23 for 6 GHz IMT designation. In the following, we would like to offer our reasoning for our position. Mobile Service, Fixed Services and Fixed-Satellite Services have co-primary status in the 6 GHz band (5925-7125 MHz). In many regions, including Region 3, Fixed-Satellite Service (FSS) earth stations (Earth-to-space direction) in conjunction with commercial Fixed Services are already operational in the band. As the band already enjoys Mobile allocation by ITU, cellular mobile operation is provisioned and can be administered flexibly regionally or nationally without a need for IMT designation. Any IMT designation may require costly re-farming of the band and relocation of incumbents to other bands. Relocation would also require availability of suitable sub 10 GHz spectrum. Alternatively, sharing mechanisms, such as Automated Frequency Coordination (AFC), being proposed by U.S. Federal Communication Commission (FCC) and being evaluated by administrations in other regions, can facilitate co-existence with incumbent Fixed Services. Extensive efforts are underway in Regions 1 and 2 in 6 GHz bands (5925-7125 MHz) to expand license-exempt device operation. More specifically, the European Commission has issued directives in form of an <u>EC Mandate </u>to CEPT to conduct the studies for co-existence and harmonized technical conditions for RLAN operation in the band. Please see recently published <u>ECC Report 302 </u>and <u>draft CEPT Report 73</u>. Similarly, FCC has issued a Notice of Proposed Rule Making for unlicensed use of the 6 GHz Band <u>(NPRM</u>). The 6 GHz Report and Order is expected to be issued by the end of 2019. Flexible sharing of the band facilitates growth and innovation globally. Consideration of an agenda item for WRC-23 for 6 GHz IMT designation, would be counterproductive as it may disrupt advancing growth and innovation globally and across Region 3 and cause

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		unnecessary regulatory burden both at ITU and regionally. IEEE 802 respectfully requests MCMC to consider developing a position to oppose inclusion of 6 GHz IMT designation as an agenda item for WRC-23.

Conclusion

IEEE 802 LMSC appreciates the opportunity to share its view of the WRC-19 agenda items above and hopes that it will provide MCMC further insight on how to approach them during WRC-19.