

MICROSOFT COMMENTS ON OFCOM'S CONSULTATION ON IMPROVING SPECTRUM ACCESS FOR CONSUMERS IN THE 5 GHz BAND

10 April 2017

Microsoft appreciates the opportunity to respond to Ofcom's Consultation on Regulations and proposed technical parameters for improving spectrum access for consumers in the 5 GHz band¹.

Q1: Do you have any comments on the drafting of the Proposed Regulations?

Microsoft commends Ofcom for its decision to extend licence-exempt RLAN access to 5725-5850 MHz. As set out in Microsoft's response to the preceding consultation², and as Ofcom has summarised well on pages 9-11 of its Statement, there is clear evidence of increasing consumer and enterprise demand for Wi-Fi and that the provision of more spectrum in the 5 GHz band is essential in addressing this demand. Even though we believe the technical parameters for Wi-Fi operations between 5725-5850 MHz are more conservative than necessary, Microsoft believes that Ofcom's decision to follow through on its 'short term' option to make additional spectrum available represents an important step that will benefit UK Wi-Fi users. It also demonstrates welcome leadership by Ofcom for extending the 5 GHz band to meet Wi-Fi demand in Europe and more widely in ITU Region 1.

We therefore underline the importance of also following up the 'medium' and 'long term' options for extending license-exempt spectrum availability in the 5 GHz band, which were set out in Ofcom's May 2016 consultation and recalled in paragraph 1.02 of the Statement. It is only by progressing through this full menu of options that Ofcom can hope to fully meet demand in the 5 GHz band and Microsoft fully supports and strongly encourages Ofcom to continue this important work.

Q2: Do you have any comments on the proposed technical parameters?

Microsoft believes it is very important to ensure protection from interference for incumbent and primary users of spectrum, and appreciates the need for technical parameters with which individuals must comply when operating equipment in the 5725 – 5850 MHz frequencies. Nevertheless, we also believe that technical requirements should be no more restrictive than necessary in order to maximize the efficient overall use of the spectrum. In that regard, we have some comments on the proposed parameters.

- **Location restrictions**

As consumers carry their Wi-Fi® enabled phones, laptops, and other portable devices both indoors and outdoors, there is a need to provide Wi-Fi capacity everywhere. Microsoft continues to believe that the 5725-5850 MHz frequency band should be available for both indoor and outdoor Wi-Fi use. The prohibition of placing fixed access points operating between 5725-5850 MHz outdoors will limit the utility of this spectrum. Based on a maximum EIRP of 200 mW (20 dBm) and assuming a 17 dBm building penetration loss at 5.8 GHz³, at most there will be only a 3 dBm (2 mW) signal radiating outdoors from indoor access points, severely limiting the distance beyond the building in which a 5725-5850 MHz enabled portable device will be able to complete a link, particularly where there are multiple Wi-Fi devices in the immediate vicinity.

¹ https://www.ofcom.org.uk/data/assets/pdf_file/0032/98159/5p8-Regs.pdf

² https://www.ofcom.org.uk/data/assets/pdf_file/0030/89373/Microsoft.pdf

³ Consultation Document at page 45

We appreciate Ofcom's statement that Wi-Fi operations under the proposed technical parameters *"would still allow Wi-Fi to meet the demand in the majority of mainstream scenarios where spectrum is constrained today such as in shopping centres and transport hubs."*⁴ Nevertheless, there are many use cases where outdoor access to the spectrum plays an important role in meeting the demand for Wi-Fi - restaurants or coffee shops providing Wi-Fi to customers seated outdoors; a company providing Wi-Fi to employees across its campus; a university wanting to deploy a high-capacity Wi-Fi canopy to students across its campus; and at public facilities such as parks.

- **Radiated power limits**

As Ofcom notes, with regard to the May 2016 consultation, *"most respondents recommended making the sub-band available with a radiated power limit of 1 W EIRP, indoor and outdoor, subject to coexistence with other users"*.

The proposed radiated power limit of 200 mW is based on Ofcom's coexistence analysis of coexistence between RLANs and Fixed Satellite Services. However, as noted in paragraph 3.32 of the Statement, *"the risk to satellite systems is minimal even in a scenario where the rest of Europe and Africa would start authorising Wi-Fi in this band under the same technical conditions. Wi-Fi use in the UK alone presents no risk to satellite systems and would create interference far below the safe thresholds used by the ITU"*.

As described in annex 6, for harmful interference to satellites to occur, there would need to be *"a great increase in the number of satellites in this band"*, which is actually expected to become a *less* popular band for satellites in the future due to its use in many parts of the world for both Wi-Fi and ISM.

Because Ofcom is proposing to prohibit outdoor access points, and assuming a building loss of 17 dB, it would appear that there is room to raise the maximum indoor radiated power level. Microsoft therefore suggests that the radiated power limit could be set at an increased level of 1 W EIRP, but with the clear understanding that Ofcom will keep this under review and lower it if / when the rest of Europe and Africa authorize Wi-Fi in this band.

In addition, Ofcom could consider protecting satellite users through others means. This could take the form of simple access point antenna restrictions, such as reductions in the maximum EIRP above a certain degree elevation of the antenna, along the lines of the downtilt rules the United States Federal Communications Commission instituted to address aggregate interference to fixed satellite uplinks operating in the 5150-5250 MHz range, where the maximum EIRP above 30-degrees elevation is limited to 125 mW (21 dBm)⁵. The required tilt angle with respect to the horizon for the 5725-5850 MHz range in the UK may be different.

- **DFS requirements**

If Ofcom decides to proceed with its proposed prohibition on outdoor placement of fixed access points operating between 5725-5850 MHz, the DFS requirements would not seem to be necessary given the indoor-to-outdoor attenuation. In terms of the proposed Regulations, we therefore propose that Ofcom either allows outdoor placement of access points operating between 5725-5850 MHz or remove the DFS requirements.

⁴ Ibid

⁵ See *Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, First Report and Order, 29 FCC Rcd. 4127 (2014) at paragraph 37.