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| Source:  | Belarus, Estonia, Liechtenstein, Lithuania, Russian Federation, Slovenia, Switzerland |
| Subject:  | Proposed studies on Wireless Access Systems including Radio Local Area networks in 6 GHz band |
| NGroup membership required to read? (Y/N) |
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| Summary:  |
| This document considers the potential of 6 GHz band to offer spectrum opportunities to accommodate Wireless Access Systems including Radio Local Area networks (WAS/RLAN). A work item for relevant studies within WG FM is suggested.  |
| Proposal:  |
| The co-signing administrations propose that ECC Plenary tasks WG FM to conduct studies in view of developing harmonised usage conditions for WAS/RLAN in the 6 GHz band.  |
| Background:  |
| There are growing demands on Wi-Fi, in terms of capacity and data rate. In order to respond to these demands, further frequency ranges in addition to available spectrum at 2.4 GHz and 5 GHz need to be considered for use by WAS/RLAN.  |

1. **Spectrum requirements for RLAN**

The key role that off-load capability plays and going to play in the future in delivering mobile data traffic has been emphasized by a number of traffic studies and market demand estimates. According to a report from Cisco[[1]](#footnote-1), total IP traffic through WiFi connected to a fixed network will reach 97.4 Exabytes per month in 2020, up from 30.8 Exabytes per month in 2015. ABI Research anticipates more than 20 billion Wi-Fi chipsets to ship between 2016 and 2021[[2]](#footnote-2).

The results of ITU-R studies towards WRC-15 indicate that the minimum spectrum requirement for RLAN using the 5 GHz frequency range in the year 2018 is estimated to be 880 MHz[[3]](#footnote-3). As far as Europe is concerned this figure includes 455 MHz of spectrum already utilized by non-IMT mobile broadband applications operating in the 5 GHz frequency range resulting in 425 MHz of additional spectrum being required.

A recent study from Qualcomm recommends regulators to plan for around 1280 MHz of unlicensed spectrum centred around the 5 GHz band for use by unlicensed technologies to enable future WLAN-type application and usage scenarios[[4]](#footnote-4).

WRC-19 will consider the results of studies concerning WAS/RLAN in the frequency bands between 5 150 MHz and 5 925 MHz and may potentially extend the WiFi available spectrum in Europe by 320 MHz[[5]](#footnote-5). Even with this development, the 5 GHz frequency range is too limited to meet the spectrum requirement for RLAN. Moreover, as far as the band 5 350-5 470 MHz is concerned, no solutions have been currently found to ensure relevant protection to all incumbent services in this band, reducing thus the chances for this band to accommodate WAS/RLAN use.

1. **Consideration of the 6 GHz band**

In view of the above, it is required to consider further frequency ranges for use by WAS/RLAN in addition to available spectrum at 2.4 GHz and 5 GHz that could be harmonised within CEPT.

The spectrum immediate adjacent to the 5 GHz band, namely the frequency band 5 925-6 700 MHz could be a good candidate for such consideration. In this band there is primary Mobile allocation in all three ITU-R regions. This band is also allocated to Fixed services, and Fixed-satellite service (Earth-to space) on a primary basis. In accordance with Article 5 in the upper part of this band, administrations should bear in mind the needs of the Earth exploration-satellite (passive) and space research (passive).

Historically, C-Bands bandwidths around 6 GHz (Earth-to space) and 4 GHz (space-to-Earth) have been commonly paired for FSS transmissions[[6]](#footnote-6). For example, in some FSS networks the extended C-band FSS Downlink 3 400-3 700 MHz is paired with the extended C-Band FSS Uplink 6 425-6 725 MHz and in some others FSS networks the band 3 400-3700 MHz is paired with the band 5 725-6 025 MHz.

The existing ECC regulatory framework harmonises the band 3 400-3 800 MHz for mobile/fixed communications networks[[7]](#footnote-7). Furthermore, WRC-15 harmonised the frequency band 3 400-3 600 MHz for mobile broadband including an IMT identification on a large geographical scale. Such framework leads to the downlink and uplink misbalance for the paired FSS 6/4 GHz allocations taking into account difficulty to share the band 3 400-3 800 MHz by FSS receiving earth stations and IMT stations in the same geographical area.

There are already some studies available on sharing between FSS and IMT in the band 5 850-6 425 MHz[[8]](#footnote-8). These studies recognize the difficulty for IMT networks to share C-band frequencies with FSS. However, noting lower transmission power levels of WAS/RLAN applications as compared to IMT as well as practical possibilities for mitigation (e.g. indoor operation), the co-existence scenario between WAS/RLAN and FSS may appear manageable.

1. **Proposed studies**

In order to resolve the spectrum shortfall issue for WAS/RLAN, it is suggested to start CEPT studies in view of developing harmonised usage conditions for WAS/RLAN in the 6 GHz band.

These studies should address:

* technical and operational characteristics of WAS/RLAN in the 6 GHz frequency range;
* sharing and compatibility issues between WAS/RLAN and incumbent radiocommunication services in the 6 GHz frequency range;
* any necessary mitigation techniques and conditions on WAS/RLAN that would facilitate sharing with the incumbent radiocommunication services, while protecting their current and planned use.

A proposed new work item for WG FM is given in Annex 1.

**Annex 1: Proposed work item on WAS/RLAN in 6 GHz band**

| **Reference** | **Subject** | **Scope** | **Remarks** | **Start** | **End** | **Triggered by** | **ECO support (Y/N)** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| FM\_xx | 6 GHz Wireless Access Systems including Radio Local Area networks | Development of harmonised usage conditions for Wireless Access Systems including Radio Local Area in the 6 GHz band. Development of a related ECC Decision.  |   | March 2017 | December 2018 | ECC #44 March 2017 | Y |

1. <http://www.cisco.com/c/m/en_us/solutions/service-provider/vni-forecast-highlights.html> [↑](#footnote-ref-1)
2. <https://www.abiresearch.com/press/abi-research-anticipates-more-20-billion-cumulativ/> [↑](#footnote-ref-2)
3. CPM Report on technical, operational and regulatory/procedural matters to be considered by WRC-15. [↑](#footnote-ref-3)
4. <https://www.qualcomm.com/documents/quantification-5-ghz-unlicensed-band-spectrum-needs> [↑](#footnote-ref-4)
5. WRC-19 Agenda item 1.16 - issues related to wireless access systems, including radio local area networks (WAS/RLAN), in the frequency bands between 5 150 MHz and 5 925 MHz, and take the appropriate regulatory actions, including additional spectrum allocations to the mobile service, in accordance with Resolution 239 (WRC-15). [↑](#footnote-ref-5)
6. Handbook on Satellite Communications, Third Edition, International Telecommunication Union, 2002. [↑](#footnote-ref-6)
7. ECC Decision (11)06 - Harmonised frequency arrangements for mobile/fixed communications networks (MFCN) operating in the bands 3400-3600 MHz and 3600-3800 MHz. [↑](#footnote-ref-7)
8. Report ITU-R S.2367 - Sharing and compatibility between International Mobile Telecommunication systems and fixed-satellite service networks in the 5 850-6 425 MHz frequency range. [↑](#footnote-ref-8)