IEEE 802 5G Spectrum Considerations

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Re:
5G/IMT-2020 Standing Committee
Base Contribution:
[none]
Purpose:
For discussion at 5GSG meeting of 2016-04-20

Background

- IEEE 802-ec-16-0062-00 (presented 2016-03-30) said: “WRC-19 agenda looks above 24 GHz for new IMT spectrum”
- Followup question by Andrew Myles, asking if WP 5D may also consider lower frequencies for IMT-2020.
- per draft minutes 802-ec-16-0062:
  - *Andrew asking about slide 5 and the above 24GHz spectrum identification*
  - *WP5D is about identifying above 24GHz, other spectrum is currently not in scope of any group, e.g. 6 GHz is not in current scope of WP5D*
- This contribution includes a more complete record of the response and further detail, plus additional considerations on spectrum.

Question and Response

- My understanding of the question: *ITU-R is looking above 24 GHz for new IMT spectrum, but does this preclude WP 5D from also considering new frequencies below 6 GHz for IMT-2020?*
- My understanding of my answer: *WP 5D is not tasked to identify IMT spectrum; WRC-19 may identify new IMT spectrum and has tasked ITU-R to provide information about specific bands above 24 GHz in preparation for its 2019 decision.*
- More comprehensive information follows.

WRC-15 and IMT

- World Radio Conference (WRC)
  - updates Radio Regulations (Regs)
  - adopts resolutions and recommendations
  - Met in November 2015 (WRC-15); next meeting is WRC-19 in 2019
- ITU Radio Regs identify bands for “IMT”, which narrowly refers to a particular set of ITU standards.
  - “IMT is the root name that encompasses IMT-2000, IMT-Advanced and IMT-2020 collectively” (per WRC-19 Res. 224)

WRC-15 Res. 238

- *resolves to invite ITU-R…*

    1. *to conduct and complete in time for WRC-19 the appropriate studies to determine the spectrum needs for the terrestrial component of IMT in the frequency range between 24.25 GHz and 86 GHz, taking into account… the deployment scenarios envisaged for IMT-2020 systems and the related requirements of high data traffic…*

    2. *to conduct and complete in time for WRC-19 the appropriate sharing and compatibility studies… for the frequency bands… 24.25-27.5 GHz, 37-40.5 GHz, 42.5-43.5 GHz, 45.5-47 GHz, 47.2-50.2 GHz, 50.4-52.6 GHz, 66-76 GHz, 81-86 GHz… 31.8-33.4 GHz, 40.5-42.5 GHz and 47-47.2 GHz*

- *further resolves… to invite WRC-19 to consider, based on the results of the above studies, additional spectrum allocations to the mobile service on a primary basis and to consider identification of frequency bands for the terrestrial component of IMT; the bands to be considered being limited to part or all of the bands listed in resolves to invite ITU-R 2* [i.e. those listed above]

ITU-R Work Programmes

- ITU-R Working Party 5D is a unit of ITU-R Study Group 5
- The Working Methods and Work Programme of an ITU-R Study Group are assigned by the ITU-R Radiocommunication Assembly (RA)
    - *the work programme of any Radiocommunication Study Group shall be:*
        - *studies, within the scope of the Study Group, on topics relevant to agenda items, Resolutions and Recommendations of Radiocommunication Conferences, or to ITU-R Resolutions;*
        - *the Questions listed in Annexes 1 to 6, referred to the Study Groups;*
        - *studies, within the scope of the Study Group, that will be carried out in accordance with § A1.3.1.2 of Annex 1 of Resolution ITU-R 1 without Questions;*

Working Party 5D Work Programme

- ITU-R RA met 24-30 Oct 2015 (RA-15); the Book of ITU-R Resolutions represents the conclusions and list of Questions
- Study Group 5 was assigned work
- Study Group 5 assigned relevant work to WP 5D
  - and other interesting IMT work to Task Group 5/1
    - per details decided by Conference Preparatory Meeting (CPM) for WRC-19

New ITU-R Task Group 5/1, for WRC 19

- *to conduct and complete in time for WRC19 the appropriate studies to determine the spectrum needs for the terrestrial component of IMT in the frequency range between 24.25 GHz and 86 GHz, taking into account:*
    - *technical and operational characteristics of terrestrial IMT systems that would operate in this frequency range, including the evolution of IMT through advances in technology and spectrally efficient techniques;*
    - *the deployment scenarios envisaged for IMT-2020 systems and the related requirements of high data traffic such as in dense urban areas and/or in peak times; …*
- *to conduct and complete in time for WRC19 the appropriate sharing and compatibility studies, taking into account the protection of services to which the band is allocated on a primary basis, for the frequency bands:*
    - *24.25-27.5 GHz, 37-40.5 GHz, 42.5-43.5 GHz, 45.5-47 GHz, 47.2-50.2 GHz, 50.4-52.6 GHz, 66-76 GHz and 81-86 GHz, which have allocations to the mobile service on a primary basis; and*
    - *31.8-33.4 GHz, 40.5-42.5 GHz and 47-47.2 GHz, which may require additional allocations to the mobile service on a primary basis*

Working Party 5D, 2016-19

- *ITU-R Working Party 5D Structure and Workplan*
  - Document 5D/TEMP/75
  - per WRC, CPM, RA, ITU-R, and SG 5

Summary

- ITU-R Study Groups, including Study Group 5, Task Group 5/1, Working Party 5D, etc. do not identify IMT spectrum
- WRC-15 invited ITU-R to conducts studies, for WRC-19, relevant to identification of possible new IMT spectrum bands, from a list of bands in the 24-86 GHz range.
- WRC-15 invited WRC-19 to consider only the listed bands for IMT identification.
- Working Party 5D will develop IMT-2020 (and update IMT-2000 and IMT-Advanced standards), with an awareness of possible IMT bands.

WRC-15 Res. 239

- *Studies concerning Wireless Access Systems including radio local area networks in the frequency bands between 5 150 MHz and 5 925 MHz.*
- *invites ITU-R to conduct and complete the following in time for WRC-19…* [a set of studies]
  - see IEEE 802.18-16/0016r1 for more information
  - no reference to IMT
  - WP 5D is identified as an “interested” group but not a responsible or contributing group

Commentary 1

- An IEEE technology incorporated into an IMT radio interface will be included among the technologies for which IMT spectrum is “identified.”
  - In this case, regulators may be unreceptive to requests for more spectrum for that IEEE technology.
- Spectrum that is under study for possible IMT identification at WRC-19 will not necessarily be identified for IMT.
  - Those interested in these bands for non-IMT use may advocate that it not be identified for IMT.

Commentary 2

- The ITU Radio Regs “identify” some spectrum for IMT.
  - IMT is specified in ITU Recommendations
- Per Radio Regs, use of the bands 5 150-5 250 MHz, 5 250-5 350 MHz and 5 470-5 725 MHz by the mobile service “will be for the implementation of WAS, including RLANs, as described in the most recent version of Recommendation ITU-R M.1450.”
- Rec. ITU-R M.1450 is a list of Wireless Access Systems (WAS)
  - Consider providing an overarching specification of WAS in Rec. ITU-R M.1450
    - could provide technology commonality, such as a coexistence protocol