P802.16s PAR to NesCom: Additional Remarks on Standards of Similar Scope

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Roger Marks, EthAirNet Associates
Tim Godfrey, EPRI

PAR and CSD

Draft PAR:

IEEE 802.16-15-0051-00

Draft CSD:

IEEE 802.16-15-0052-00

PAR Title:

IEEE Standard for Air Interface for Broadband Wireless Access Systems – Amendment for Fixed and Mobile Wireless Access in Channel Bandwidth up to 1.25 MHz [amendment to IEEE Std 802.16]

Comments and Responses

Document:

IEEE 802.16-15-0050-00

Spreadsheet:

http://comments16s.wirelessman.org

Draft PAR, Item 7.1

7.1 Are there other standards or projects with a similar scope?: No

PAR Item 5.2b:

802.20 WG: There are other standards (other than IEEE802.16), which covers the above scope of PAR, while supporting the operation with the channel sizes up to 1.25 MHz in the licensed spectrum below 3.5GHz. The scope needs to be modified while not duplicating the existing TDD standards.

802.16 response: We are not aware of other standards with similar scope. See next comment for further detail.

PAR Item 7.1:

802.20 WG: The PAR answer for item #7.1 is incorrect.

There other existing and Global TDD standards in Channel Sizes up to 1.25 MH:

-IEEE Std. 802.20-2008 (TDD Modes)

-ATIS –HC-SDMA- 2005

-ATIS –HC-SDMA- 2007

-ARIB STD-T97 Sep.2008 (JAPAN)

-ISO 25113:2010

The PAR must answer Yes to item #7.1 and list all the above listed TDD standards

802.16 response: IEEE Std 802.20 (and, to our knowledge, the other referenced standards) supports an optional TDD mode operating in 625 KHz channels, which is inapplicable to the bandwidths of interest in this project. The fixed 625 KHz channel size would not efficiently use the 1 MHz spectrum that is an objective of this amendment, and precludes many required frequency reuse methods. The wideband TDD mode of the 802.20 standard only supports channel widths above 2.5 MHz. Consequently, we don't believe that the referenced standards are of similar scope.

PAR Item 7.1:

802.11 WG: 3GPP develops NB-IOT (narrow band LTE for Internet of Things) which is similar in scope to this project scope – from 5.2b: “This system profile will specify operation in exclusively-licensed spectrum with channel sizes up to 1.25 MHz, including 1 MHz explicitly”. How is this project different from the 3GPP case?

802.16 response: NB-IOT is not of similar scope. This project is to amend the 802.16 standard. 3GPP standards are not compatible with the 802.16 standard.

802.11 Rebuttal: NB-IOT is of similar scope and has similar use cases in the same band. Therefore, it should be identified in 7.1. However, we recognize that the identified stakeholders appear to have a need for an 802.16 based solution, and the competing solution may not meet their needs. We suggest you include this information in 7.1 because it explains why this amendment to 802.16 may be justified.

Comparison to NB-IOT (per 3GPP Work Item Description RP-151621)

The objective is to specify a radio access for cellular internet of things, based to a great extent on a non-backward- compatible variant of E-UTRA, that addresses improved indoor coverage, support for massive number of low throughput devices, low delay sensitivity, ultra low device cost, low device power consumption and (optimised) network architecture.

Comparison to NB-IOT (per 3GPP Work Item Description RP-151621)

NB-IOT should support 3 different modes of operation:

1. *'Stand-alone operation' utilizing for example the spectrum currently being used by GERAN systems as a replacement of one or more GSM carriers*
2. *'Guard band operation' utilizing the unused resource blocks within a LTE carrier's guard-band*
3. *'In-band operation' utilizing resource blocks within a normal LTE carrier*

Comparison to NB-IOT (per 3GPP Work Item Description RP-151621)

180 kHz UE RF bandwidth for both downlink and uplink

For the uplink, two options will be considered: FDMA with GMSK modulation (as described in 3GPP TR 45.820 section 7.3), and SC-FDMA (including single-tone transmission as a special case of SC-FDMA)

Two numerology options will be considered for inclusion: 15 kHz sub-carrier spacing (with normal or extended CP) and 3.75 kHz sub-carrier spacing.

Comparison to NB-IOT (per 3GPP Work Item Description RP-151621)

For the standalone mode of operation: on scenarios and criteria documented in 3GPP TR 45.820 Sections 4 & 5, and Annex A (with the exception of impacts to GSM base station baseband)

- *For in-band & guard-band mode of operation: on scenarios and criteria documented in 3GPP TR 45.820 Sections 4 & 5, and Annex A (with exception of impacts to GSM base station baseband and RF), plus newly defined scenarios and criteria based upon the same TR e.g. interference to/from legacy LTE operation*
- *For power consumption, latency, and capacity, this evaluation will assume use of Gb interface towards the core network*

Comparison to NB-IOT (per 3GPP Work Item Description RP-151621)

MAC, RLC, PDCP and RRC procedures based on existing LTE procedures and protocols and relevant optimisations to support the selected physical layer

Conclusion

In our view, the draft PAR answers item 7.1 correctly.

7.1 Are there other standards or projects with a similar scope?: No