**IEEE P802.19**

**Wireless Coexistence**

|  |  |
| --- | --- |
| Project | IEEE P802.19 Wireless Coexistence WG |
| Title | **SA Initial Ballot Comment Resolution Proposal** |
| Date Submitted | October 21, 2020 |
| Source | Benjamin A. RolfeBlind Creek AssociatesP.O. Box 798 Los Gatos, CA, USA 95031 | Voice: (408) 395 7207 E-mail: ben.rolfe @ ieee.org |
| Re: | Initial SA Ballot Comment resolution  |
| Abstract | Proposed resolution to comments assigned to BR. Comment IDs: 271721 271712 271706 271681 271680 271675 271643 271638 271624 271622 271606 271601 271593 271592 271589 271586 271482 271481 271453 271452 |
| Purpose | Resolve comments |
| Notice | This document has been prepared to assist the IEEE P802.19. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein. |
| Release | The contributor acknowledges and accepts that this contribution becomes the property of IEEE and may be made publicly available by IEEE P802.19. |

# CID 271721

Proposed resolution:

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| Revised | Replace text of point 5 with:Use of the Bidirectional TXOP (BDT) allows IEEE Std 802.11ah devices exchange a sequence of uplink and downlink PPDUs separated by SIFS. This operation combines both uplink and downlink channel access into a continuous frame exchange sequence between a pair of 802.11ah devices. One stated objective of this operation is to minimize the number of contention-based channel accesses. |

Analysis: Quoting directly from 802.11ah, the purpose of BDT is to minimize the number of contention-based channel accesses, improve channel efficiency by reducing the number of frame exchanges, and reduce S1G STA power consumption by shortening Awake times. The first two will impact coexistence performance. The total duration of the BDT Initiator PPDUs shall not exceed the TXOP limit as described in 10.22.2.3, which does not provide a specific upper limit on the duration of the TXOP. It may be that BDT reduces overall number of frame exchanges, which can improve coexistence performance. Use of BDT may also increase time between contention based channel accesses, which may have a negative impact on the performance of the 802.11ah devices due to interference from other Sub-1GHz devices (some of which do not use CSMA type channel access). Thus BDT use can be a key factor in overall coexistence performance.

Note that I do not find any mention of using CSMA between transmissions in a BDT, so but the above cite suggests that CSMA is not invoked between exchanges in the BDT.

# CID 271712

Proposed resolution:

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| Revised | Change “standard” to “recommended practice” |

Analysis: Per the example in the IEEE Style Manual, “this recommended practice”, “this standard” or “this document” are all correct.

# CID 271706

Proposed resolution:

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| Revised | Change “e.r.p.” to “ERP” in Table 2 heading, and add ERP to 3.2 as “Effective Radiated Power”.  |

Analysis: It solves the problem and looks better as ERP.

# CID 271681

Proposed resolution:

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| Revised | Delete sentence “IEEE Std 802.11ah network can be organized in star topology, mesh topology or tree topology.” |

Analysis: Per 802.11ah 4.3.13a.1 Overview, “An S1G STA is a non-mesh STA”. 802.11ah differentiates its relay operation from an mesh STA in 802.11. So while S1G “relays” seems to be mesh-like, the term may cause confusion. Thus it is simplest to avoid the discussion of topology here to avoid further confusion (I am confused enough for the group).

# CID 271680

Proposed resolution:

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| Revised | Change “from 2048 up to 8192 per AP” to “stations, from 2007 up to 8191 per AP” |

Analysis: Assuming the comment is correct. I did not find either number.

# CID 271675

Proposed resolution: **Recommend discussion in the group.**

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| To Be Discussed |  |

Analysis: There are two options.

* Accept the comment, in which case the statement is still correct.
* Reject the comment as the current text is not wrong: when mesh is used with lower power levels to achieve a range instead of higher power, interference per device is reduced.

Many implementations use mesh with lower power, in which case the interference per devices is reduced. However some implementations use mesh without lower power. So actually achieving reduced interference per device depends on the implementation.

Mesh topologies do allow lower-power radios to be used to extend the range of the network beyond the range of the radio. A mesh device can use information from peer nodes to scale power per link to only what is needed to reach that peer, which greatly reduces the interference footprint of that transmission. So the statement that mesh enables lower power is true. However, not all implementations of 802.15.4g use such power scaling. In some implementations a devices transmit power is fixed, regardless of the power needed for a specific link. So meshing does not change the impact of that device on others. Now it depends on the mesh protocol being used, but it is possible that because a mesh introduces multiple hops, meaning the same context is transmitted multiple times to get from source to destination, that aggregate power in the channel is increased.

# CID 271643

Proposed resolution:

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| Revised | Delete parenthetical “(ALOHA 34 threshold ~18% effective channel load)” |

Analysis: Take the third option from the comment. The actual threshold for where CSMA provides benefit depends on a number of factors, the discussion of which are out of scope of this clause and not essential to the recommendation that follows.

# CID 271638

Proposed resolution:

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| Rejected | The commenter does not provide a specific proposed change for this sub-clause sufficient for the group to understand how to satisfy the comment. The sub-clause is an overview description of centralized coordination. The prohibition noted in the comment regarding frequency hopping is described in sub-clause 6.2. Also the front matter of all IEEE standards advises the user that it is the responsibility of the user to comply with all laws and regulations. The discussion of Frequency Hopping in 9.2.11 recommend non-centralized control schemes for frequency hopping, which would address the limitations noted by the comment.  |

Analysis: Didn’t think of a way to make the current text more clear.

# CID 271624

Proposed resolution:

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| Accept |  |

Analysis: The proposed change is good.

# CID 271622

Proposed resolution:

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| Revised | Change “subsequently rolled into IEEE Std 802.15.4™-2015” to “now included in IEEE Std 802.15.4™-2020”. Change reference in clause 2 to the 2020 revision. In 4.3, 3rd paragraph: “Table 1 shows the PHY terminology used in IEEE Std 802.15.4g-2012 to the terminology used in the current standard” and change 2015 to 2020 in Table 1 heading. In the 5th paragraph of 4.3, replace “802.15.4-2015” with “802.15.4”In 6th paragraph of 4.3 change “2015” to “2020”.11th paragraph of 4.3 (starting “a number of amendments to…” ) change to “A number of amendments to 802.15.4-2015, subsequently included in IEEE Std 802.15.4-2020, have added band plans for a large number of regional Sub-1 1 GHz bands and data rate enhancement”. In 9.2.2.5 change “2015” to “2020”. |

Analysis: Reviewed specific citations of 802.15.4-2015 and found mostly OK to change to 2020 or simple leave off the revision detail (the convention is “802.15.4” means the latest revision). A few places minor rewording was needed. In the last part of 4.3, discussing specifically amendments to 2015, it is correct to add that these are now included in 2020, but the reference to 2015 is correct.

# CID 271606

Proposed resolution:

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| Revised | In 6.2 where first use of “IEEE Std 802.11 in 6.2, add the “TM”. Note that the convention according to IEEE editors is to include “TM” mark at the first use of a standard name in the body of text.  |

Analysis: First use of each standard name in the body of text must include the “TM” and subsequent uses should not according to IEEE editors. Checked all, found only one not following the convention: Noted that first use if IEEE Std 802.11 in 6.2 needs the “TM” added.

# CID 271601

Proposed resolution:

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| Accepted  |  |

Analysis: 15.4x is referenced in clause 7. Clause 7 could be considered normative as it identifies coexistence mechanisms subject to recommendations. So do what he said.

# CID 271593

Proposed resolution:

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| Rejected | IEEE Std 802.15.4v is cited only in clause 4 which is an overview so the reference via bibliography is correct.  |

Analysis: 802.15.4v and 802.15.4u are cited only in clause 4, which is an overview and so considered informative. Thus correctly in the bibliography.

# CID 271592

Proposed resolution:

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| Rejected | IEEE Std 802.15.4u is cited only in clause 4 which is an overview so the reference via bibliography is correct.  |

Analysis: 802.15.4v and 802.15.4u are cited only in clause 4, which is an overview and so considered informative. Thus correctly in the bibliography.

# CID 271589

Proposed resolution:

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| Rejected | IEEE Std 802.15.4e is cited only in clause 4 which is an overview so the reference via bibliography is correct.  |

Analysis: Only find 4e reference in clause 4.

# CID 271586

Proposed resolution:

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| Accepted |  |

Analysis: IEEE Std 802.15.4w is cited in clause 7 and clause 9 so it is properly cited as a normative reference.

# CID 271482

Proposed resolution:

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| Revised | Add paragraph at the end of 7.7.1:While other regions and environments will of course present different specific noise and interference specifics, the results of these specific studies illustrate the wide variety of systems using the sub-1GHz unlicensed bands. We can expect in other regions to experience similar diversity of uses. Many of the interference sources noted in the observations will likely be present in many other regions.  |

Analysis: The data available did not include measurements in the 915 band in the US. Without invalid extrapolation of the data, there isn’t much to say other than that it is likely to see similar results elsewhere if you were to look closely.

# CID 271481

Proposed resolution: **Recommend discussion in the group.**

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| To Be Discussed |  |

Analysis: We’ve avoided “shall” as instead used “should” throughout, as the content of this document are recommendations. However, per discussion with IEEE staff, it is valid to use “shall” (“it is required to”) in a recommended practice if the stated behavior is essential (required) to the implementation of the recommendation. I’ve looked at the recommendations in clause 9 and am not sure if where there would be appropriate changes. Further input from contributors is required.

# CID 271453

Proposed resolution:

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| Accepted |  |

Analysis: The revised wording is better.

# CID 271452

Proposed resolution: **Need further input**

|  |  |
| --- | --- |
| Disposition Status | Disposition Detail |
| To Be Discussed |  |

Analysis: This comes from the translation of the ARIB document, and is unclear. I need someone who can read the original to clarify.