**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title | **Resolutions for comment rows 468, 474, 475, 602, 609** | |
| Date Submitted | 9th August 2017 | |
| Source | Billy Verso (Decawave), | billy.verso (at) decawave.com |
| Re: | Comment resolutions of 802.15.8 -- SB1 | |
| Abstract | This gives proposed resolutions for the indicated comments from the first sponsor ballot of the 802.15.8 draft standard. | |
| Purpose | The purpose of this document is to resolve the comment | |
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| **Comment row: 468** (Comment ID: 22806800023) | |
| Location detail: | **Clause 6.12.6, Page 100, line 6** |
| Comment: | As described in the previous comment, PDs with UWB PHY do not synchronize to a common superframe |
| Suggested change: | Please clarify what is the meaning of "cooperative synchronization process" or simply delete instances of this sentence as the procedure of this clause works for a PD-to-PD synchronization basis between PDs. |

**Discussion:**

The term “cooperative synchronization process” is used dozens of times in the text. This term was coined to distinguish the UWB synchronization scheme defined in clause 6.12 from the scheme defined in clause 6.4 for the OFDM PHY.

Any reader paying attention to clause 6.12 will since at least 6.12.4 be well aware of the term and its meaning.

**Resolution:**

Comment sheet “Disposition Detail” shall say:

“REJECT. The meaning of "cooperative synchronization process" is clear from clause 6.12.4 which describes its operation in detail.”

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| **Comment row: 474** (Comment ID: 22807400023) | |
| Location detail: | **Clause 6.12.8.2, Page 101, line 17** |
| Comment: | What is "few seconds"? 2,3 ? |
| Suggested change: | Please clarify |

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| **Comment row: 475** (Comment ID: 22807500023) | |
| Location detail: | **Clause 6.12.8.3, Page 101, line 26** |
| Comment: | What is "couple of seconds"? 2,3 ? |
| Suggested change: | Please clarify |

**Discussion:**

In English “a couple” is always two, while “a few” is perhaps a little more ambiguous, but generally means three or more, but not very many more. These time-period specifiers were intended as rough guidelines and were written to be little vague. However, there is no harm in defining a range as a clearer way to state them. The proposed resolution below makes changes to address these points.

**Resolution:**

Comment sheet “Disposition Detail” for rows 474 and 475 shall say:

“ACCEPT IN PRINCIPLE. The text will be modified as described in 15-17- 0463”.

***With respect to the draft “P802.15.8-D4.0.MEC.pdf”, modify page 101 clauses 6.12.8.1 to 6.12.8.3 as shown in the following tracked change:***

**6.12.8.1 Infrequent ad-hoc UWB ranging**

In the case of ranging that is performed once a minute or less frequently, there is no need to attempt to synchronize with any active UWB PAC networks, and the exchange can just be performed. However, if the ranging exchange fails, or is retried and fails more than twice, then this might indicate that there is an active UWB PAC network nearby causing a conflict, in which case the approach of clause 6.12.8.2 is more appropriate, or alternatively a different complex channel could be agreed upon by the next higher layers, and tried.

**6.12.8.2 More frequent ad-hoc UWB ranging**

In the case of ranging that is performed more often, i.e. at intervals between three seconds and one minute, the PD shall attempt to synchronize with any UWB network present by turning on the UWB receiver to listen for UWB Sync frames for up to *aSuperframeDuration*. If a Sync frame is received, the PD shall execute the UWB ranging exchange in the CAP part of the UWB superframe, randomly picking a starting place consistent with finishing the exchange before the end of the CAP. For subsequent ranging exchanges, the UWB PHY receiver can be enabled appropriately, (i.e. consistent with the worst-case clock drift since the last attempt), to receive another Sync frame to align the exchange with the CAP. If no Sync frames are received, the ranging exchange can be performed at any time as per clause 6.12.8.1.

**6.12.8.3 Very frequent ad-hoc UWB ranging**

This is ranging that is performed every three seconds or more frequently than that. At the lower end of this frequency range, the PD shall attain synchronization as per clause 6.12.8.2, and then turn on its UWB receiver sufficiently often to receive UWB Sync frames from, and maintain synchronization with, any UWB network present in the vicinity and continue to use the CAP as per clause 6.12.8.2. At the higher end of this frequency range, or where the PD wishes to use the CFP for the ranging exchange, it shall fully follow the cooperative synchronization process and use the CFP as per clause 6.12.7 for the ranging exchanges.

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| **Comment row: 602** (Comment ID: 22815700023) | |
| Location detail: | **Clause 12.2.2.1, Page 248, line 18** |
| Comment: | 48 independent channels or networks is technically unfeasible, unless using a form of multicarrier modulation. Using 48 preambles does not parallelize a channel band into independent channels. |
| Suggested change: | Please rephrase |

**Discussion:**

Okay, not really independent, but low interference due to very low cross correlation. Instead of “independent” it would be better say “virtual”, (which is the term used in the text about the SHR of the OOK modulation mode).

**Resolution:**

Comment sheet “Disposition Detail” shall say:

“ACCEPT IN PRINCIPLE. Change “independent” to “virtual”.

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| **Comment row: 609** (Comment ID: 22816300023) | |
| Location detail: | **Clause 12.2.2.1, Page 252, line 7** |
| Comment: | In previous text, it says that the preamble selection is done in higher layer, which contradicts this sentence. Moreover, the sentence implies that the preamble 28 is the one to implement while the other preambles are optional to implement. How the higher layer know which preambles, besides 28, are implemented? Or the intention is that 48 preambles are supported, but one preamble is mandatory? |
| Suggested change: | As a mandatory preamble is needed, keep this, but rephrase, add a mandatory preamble for OOK mode, and revise the text that says that the preamble selection is done in higher layer |

**Discussion:**

Since there is a cost to supporting each preamble code the intent was have to allow silicon implementers some choice of what to provide, but have a mandatory one for interworking.

There is no contradiction here. To select the preamble, the upper layer uses the phyPreambleCode PIB attribute which it sets using the MLME-SET.request primitive. The MLME-SET.confirm primitive’s return status parameter can indicate that a chosen value is not supported, and thus the upper layer can determine the supported selections. (In practice, the designer/implementer will probably know the capability of his physical layer implementation and limit his selection to the supported ones).

In review, I have noticed that “Preamble Sequence ID = 45” was nominated for the common mode so this should actually be mandatory also, giving two options always.

**Resolution:**

Comment sheet “Disposition Detail” shall say:

“ACCEPT IN PRINCIPLE. The text will be modified as described in 15-17- 0463”.

***With respect to the draft “P802.15.8-D4.0.MEC.pdf”, modify the paragraph at line 7 of page 252 as shown:***

Support for the preamble codes with ID 28 and ID 45 shall be mandatory in the BPM-BPSK modulation mode, while support for the others is optional.

***And for OOK modulation mode, at the very end of clause 12.3.2 add the following paragraph:***

Support for the preamble sequence ID 1 (Gold sequence code *i* = 0*)* shall be mandatory in the OOK modulation mode, while support for the others is optional.

**<END>**