**IEEE P802.15**

**Wireless Personal Area Networks**

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| --- | --- |
| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **Proposed Resolutions for below CIDs.****(CID#: 1, 4, 6, 25, 26, 27, 38, 39, 89, 113, ~~146~~, 182, 183, ~~196, 197, 198, 199, 200, 294, 302, 303, 304, 305, 306, 307, 308, 310,~~ 311, ~~313, 327,~~ 333, 336, 337, 386, 387, 388, 389, 393, 452, ~~453~~, 454~~, 529, 530, 585~~, 586, 587, 588, ~~591, 592, 593, 594, 595, 596, 597, 604, 623,~~ 626, 680, 681, 816, 817, 818, 823, 900, 902)**  |
| Date Submitted | Mar 2024 |
| Sources | Youngwan So (SAMSUNG Elec.)youngwan.so@samsung.com |  |
| Re: |   |
| Abstract |  |
| Purpose | To propose resolutions for suggested comments including hyper block related items for “P802.15.4ab™/D (pre-ballot) C Draft Standard for Low-Rate Wireless Networks” .  |
| Notice | This document does not represent the agreed views of the IEEE 802.15 Working Group or IEEE 802.15.4ab Task Group. It represents only the views of the participants listed in the “Sources” field above.It is offered as a basis for discussion and is not binding on the contributing individuals. The material in this document is subject to change in form and content after further study. The contributors reserve the right to add, amend or withdraw material contained herein. |

Rev 0: Extract pending or undiscussed comments from DCN 143r2 to resume discussion;

 BLACK colored CIDs below are to discuss and REDs are already discussed in 143r2.

(CID#: 1, 4, 6, 25, 26, 27, 38, 39, 89, 113, ~~146~~, 182, 183, ~~196, 197, 198, 199, 200, 294, 302, 303, 304, 305, 306, 307, 308, 310,~~ 311, ~~313, 327,~~ 333, 336, 337, 386, 387, 388, 389, 393, 452, ~~453~~, 454~~, 529, 530, 585~~, 586, 587, 588, ~~591, 592, 593, 594, 595, 596, 597, 604, 623,~~ 626, 680, 681, 816, 817, 818, 823, 900, 902)

***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

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| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Rojan Chitrakar | 586 | 31 | 10.31.3.5 | 13 | "It is used by devices as hyper block counter to identify where it is now, as ranging block index restarts from 0 again in every hyper block."The latter half of the sentence should be reprased in normative language and the first half rephrased for better clarity. | Rephrase for better clarity as:"The ranging block index of each block shall start from 0 in every hyper block and increments by one with each block. The hyper block index together with the ranging block index is used by devices to maintain synchronization with the block structure." | Accepted |
| Rojan Chitrakar | 587 | 31 | 10.31.3.5 | 15 | Sentence can be rephrased for better clarity. | Rephrase for better clarity as:"Different blocks within a hyper block may be allocated for different applications such as ranging or sensing or data communications." | Accepted |
| Rojan Chitrakar | 588 | 31 | 10.31.3.5 | 17 | Paragragph can be rephreased in normative language for better clarity. The last sentence seems to be an example refering to Figure 7 but it is not stated as an example. | Rephrase the paragraph for better clarity  | Accepted & Revised |

**Disposition Detail:** Accepted / Revised

* Rojan is suggesting rephrase sentences so to improve clarity and to distinguish normative/informative part.
* Agree Rojan’s resolutions for 586 and 587 as is, and rephrased paragraph in L17 P31 as follows;
* **Green color coded texts below are updated based on Rojan’s feedback and had comfirmation.**

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

…..

The hyper block mode is optional for all devices. Each hyper block is identified by hyper block index. This is the total number of hyper blocks that has elapsed since the start of the network and increments by one with each hyper block execution. It is announced by controller with HBS IE. The ranging block index of each block shall start from 0 in every hyper block and increments by one with each block. The hyper block index together with the ranging block index is used by devices to maintain synchronization with the block structure.

 Different blocks within a hyper block may be allocated for different applications such as ranging or sensing or data communications.

Hyper block keeps the same structure repeated in every hyper block. Round hopping is optional in hyper block mode. Round hopping may be performed in the hyper block mode in one of the following methods:

* If a controlee receives an Enhanced Ranging Round IE (ERR IE) (as described in 10.31.9.11) in which the Hopping Mode field is set to one, the controlee may hop to one of the ranging rounds in the ranging block indicated by the ERR IE.
* If the controlee receives a Scheduling IE (as described in 10.31.9.10) with the Scheduling List Type equal to six in which the controlee’s address is present in a Block Assignment field in which the Hopping Mode field is set to one, the controlee may hop to one of the ranging rounds in the ranging block indicated by the Block Assignment field.
* Otherwise, if the controlee receives a second RR IE in its ranging round in which the Hopping Mode field is set to one, the controlee may hop to one of round at the block having the same Block Index number in the next hyper block.

Note – If the controlee receives a second RR IE in its ranging round in which the Hopping Mode field is set to one, any other block scheduling method (e.g. Bitmap-based block scheduling) in hyper block mode is not used.

***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

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| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Bin Qian | 311 | 37 | 10.31.9.10 | 4 | It seems that it is not necessary to have the RSF scheduling. The first three fields in Figure 14 are same as that in Figure 13, and the last three fields in Figure 14 are same as that in MMS Ranging Configuration fields in AC IE | Remove the case when the Scheduling List Type is four | Rejected |

**Disposition Detail:**







1. As mentioned by Bin, it’s true that some portion of fields in Scheduling element with List type 4 (=Figure 14) can be acquired from Figure 13 (Scheduling element with List type 3) and the other portion can be acquired from Figure 132 (=MMS Ranging Configuration in AC IE). That implies Scheduling List Type four may not needed as all the information can be acquired from a combination of other IEs.
2. But in this case, both of Scheduling IE (Type 4) and AC IE having MMS Ranging Configuration field should be transmitted as a pair together. This is inefficient operation because to signal a couple of information (sequence index, num. of gaps, sequence repetition), we have to send AC IE which includes unnecessary information whenever needed.
3. More than that, AC IE is generally used for session configuration purpose, so it is unnatural use that IE as scheduling purpose.
4. Based on Bin’s comments, we added more texts so to avoid confusion as below.

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

***Change the text in section 10.38.9.4.3 as follows (Track changes ON)***

(P62L20)

**10.38.9.4.3 Multiple RSF transmissions in a slot without NB assist**

The operation of multiple RSF transmissions in a slot without NB assist is presented in Figure 41.

Control phase starts in the UWB channel by transmitting a UWB frame that carries the Scheduling IE (10.31.9.10) by initiator. This UWB frame should include both of slot scheduling information and RSF allocation of responders (i.e., ranging slot 0 in Figure 41). Then, the Scheduling List Type field value should be set to 4. After receiving the UWB frame, the responder replies with the ACK frame to the initiator (i.e., ranging slot 0 and 1 in Figure 41).

In the ranging phase, the UWB MMS packet including the initial SYNC+SFD fragment, as per Figure 176, is transmitted to trigger multiple RSF transmissions. In the ranging slot 3, the initiator transmits one (SYNC + SFD) fragment to trigger multiple RSF transmissions. If responder receives the (SYNC + SFD) fragment of the initiator, after AIFS the responders reply with RSF as allocated by the scheduling IE in the control phase.



***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Li-Hsiang Sun | 25 | 62 | 10.38.9.4.2 | 8 | There should be a CFO pre-correction accuracy requirement for transmission of RSF at the responder side to maintain low enough cross correlations between different RSFs at initiator side. In such case, the response messages in ranging slot 1,2 in Fig 41, 42 are not needed, and the ranging round can be made even shorter. | as in comment | revised |

**Disposition Detail:**

* Added requirement CFO pre-correction needs to be made at transmitter side (=responder) so that two received signal in receiver side (=initiator) are orthogonal each other.
* **Based on Bin’s comments I changed orthogonal to another expression (Green)**

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

***Change the text in P62L8 as follows (Track changes ON)***

**10.38.9.4.2 Basic operation**

As shown in Figure 54, Multiple RSF transmissions may be applied to devices in a ranging area network (RAN), where the responders may transmit RSFs simultaneously as scheduled by an initiator. To maintain multiple RSF signals received at the initiator side to have low enough cross correlations each other, CFO pre-correction may be required in transmitting the RSF at the responder side. How to do CFO pre-correction is out of this standard.



The procedure for multiple RSF transmissions in a slot is divided into three phases, the control phase, the ranging phase, and the measurement report phase. In the control phase, RSF transmissions are scheduled to have the RSF transmission timing of each responder. In the ranging phase, the initiator sends (SYNC + SFD) packet of UWB or poll Compact frame of NB to trigger RSF transmission. After that, multiple RSF transmissions occur from the responders to the initiator in the slot. The measurement report phase delivers ranging results from the responders to the initiator. Responders may send Ranging report Compact frames to the initiator to conduct this phase.

***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Li-Hsiang Sun | 26 | 62 | 10.38.4.9.3 | 20 | " Control phase is conducted in the UWB channel by transmitting a Data frame that carries the Scheduling IE" This should only be applicable to the frame at slot 0? | clarify the sentence is only for the frame from initiator | revised |
| Li-Hsiang Sun | 27 | 62 | 10.38.9.4.3 | 21 | which type of scheduling IE is used in this case? | clarify the list type of the scheduling IE | revised |
| Bin Qian | 333 | 62 | 10.38.9.4.2 | 17 | The ranging results could also be delivered from the initiator to the responders | As in the comment | revised |

**Disposition Detail:**



Added corresponding modifications.

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

***Change the text in section 10.38.9.4.2~3 as follows (Track changes ON)***

(P62L17)

The procedure for multiple RSF transmissions in a slot is divided into three phases, the control phase, the ranging phase, and the measurement report phase. In the control phase, RSF transmissions are scheduled to have the RSF transmission timing of each responder. In the ranging phase, the initiator sends (SYNC + SFD) packet of UWB or poll Compact frame of NB to trigger RSF transmission. After that, multiple RSF transmissions occur from the responders to the initiator in the slot. The measurement report phase delivers ranging results from the responders to the initiator. Responders may send Ranging report Compact frames to the initiator or initiator can send report to initiators to conduct this phase.

**For CID#333**

**10.38.9.4.3 Multiple RSF transmissions in a slot without NB assist**

The operation of multiple RSF transmissions in a slot without NB assist is presented in Figure 41.

**For CID#26 #27**

Control phase starts in the UWB channel by transmitting a UWB frame that carries the Scheduling IE (10.31.9.10) by initiator. This UWB frame should include both of slot scheduling information and RSF allocation of responders (i.e., ranging slot 0 in Figure 41). Then, the Scheduling List Type field value should be set to 4. After receiving the UWB frame, the responder replies with the ACK frame to the initiator (i.e., ranging slot 0 and 1 in Figure 41).

In the ranging phase, the UWB MMS packet including the initial SYNC+SFD fragment, as per Figure 176, is transmitted to trigger multiple RSF transmissions. In the ranging slot 3, the initiator transmits one (SYNC + SFD) fragment to trigger multiple RSF transmissions. If responder receives the (SYNC + SFD) fragment of the initiator, after AIFS the responders reply with RSF as allocated by the scheduling IE in the control phase.



***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Li-Hsiang Sun | 38 | 93 | 10.38.10.20.1 | 19 | The address should be the same for NB and UWB PHY if both types of Acquisition Compact frames are transmitted | as in comment | Accepted |

**Disposition Detail:**



Agreed. Proposing as below for clarification

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

***Change the text in P93L19 as follows (Track changes ON)***

**10.38.10.20 Acquisition Compact frame**

**10.38.10.20.1 General**

The Acquisition Compact frame is used for coordination. The Acquisition Compact frame shall be formatted as shown in Figure 107.

|  |  |  |  |
| --- | --- | --- | --- |
| **Octets: 3**  | **1**  | **variable**  | **2**  |
| Address  | Message Control  | Message Content  | FCS  |

**Figure 107—Acquisition Compact frame format**

The Address field shall be set as specified in 10.38.10.2.2 for Public Address. In case acquisition packet is transmitted both in UWB and NB channel, the address should be the same.

***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Bin Qian | 336 | 63 | 10.38.9.4.4 | 6, 9 | The one-to-many Poll Compact frame transmitted after the control phase is not clearly defined. Is it the Poll transmitted by UWB in Ranging Slot 3 in Figure 42? Does the initiator need to tranmit a RSF before multiple RSF transmissions from responders | As in the comment | revised |
| Rojan Chitrakar | 626 | 63 | 10.38.9.4.4 | 6 | "… trigger multiple RSF transmissions." How the responders transmit the multiple RSFs should be described in more detail, the figure is not self-explanatory. | Describe how the responders transmit the multiple RSFs. | Revised |

**Disposition Detail:**

Yes. It is the Poll transmitted by UWB in Ranging Slot 3 in Figure 42. A Poll is needed to trigger for responders to send RSFs in UWB channel. In this case, responders transmit the initiator their own RSFs which are different from each other. Therefore, initiator cannot trigger the transmission of RSF by transmitting a RSF. However, for the clarification, below changes are proposed.

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

***Change the text in P63L5 as follows (Track changes ON)***

**10.38.9.4.4 Multiple RSF transmissions in a slot with NB assist**

The operation of multiple RSF transmissions in a slot with NB assist is shown in Figure 42. The control phase is conducted by sending a One-to-many Poll Compact frame in the NB channel. After control phase, the UWB MMS packet including the initial SYNC+SFD fragment, as per Figure 176, is transmitted to trigger multiple RSF transmissions. Example operation of the multiple RSF transmissions per slot with NB assist is shown in Figure 42. In the ranging slot 3, the initiator transmits one (SYNC + SFD) fragment to trigger Multiple RSF transmissions. If responder receives the (SYNC + SFD) fragment of the initiator, after AIFS the responders reply with RSF as configured by the one-to-many Poll Compact frame in the Control Phase which transmitted in slot 0 in Figure 42. After the RSF transmission occurs, the measurement report phase is proceeded by sending ranging report Compact frames in the NB channel from the responders to the initiator.



***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Bin Qian | 337 | 63 | 10.38.9.4.4 | 7 | It is also possible to send ranging report in the NB channel from the initiator to the responders | As in the comment | Revised |
| Mickael Maman | 900 | 63 | 10.38.9.4.3 | 1 | Is it possible to send a report from the initiator to the responders? |  | Revised |
| Mickael Maman | 902 | 63 | 10.38.9.4.4 | 9 | Is it possible to send a report from the initiator to the responders? |  | Revised |

**Disposition Detail:**

 Yes, it is possible. We didn’t draw that in Figure 42 but possible. We revised as below

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

***Change the text in 10.38.9.4.4 as follows (Track changes ON)***

**10.38.9.4.4 Multiple RSF transmissions in a slot with NB assist**

The operation of multiple RSF transmissions in a slot with NB assist is shown in Figure 42. The control phase is conducted by sending a One-to-many Poll Compact frame in the NB channel. After control phase, a One-to-many Poll Compact frame is transmitted to trigger RSF transmissions. After the RSF transmission occurs, the measurement report phase is proceeded by sending ranging report Compact frames in the NB channel from the responders to the initiator and/or from the initiator to responders.



***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Carl Murray | 816 | 94 | 10.38.10.20.2 | 10 | Why not just use 1 bit for the NB AP Type and combine the other 2 bits with the existing reserved bits |  | Rejected |

**Disposition Detail:**

It’s true that transmitting something can be either of periodic or aperiodic.

But there may be other acquisition packet types which cannot be characterized just only with its periodicity. It’s also quite reasonable to merge that with the existing reserved bits, but as we are expecting such extensions, we’d like to keep as is, if it’s not a big waste of resource or if it’s not a big save to overall bit consumption.



**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

***None***

***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Benjamin Rolfe | 182 | 95 | 10.38.10.20.2  | ~~28~~24 | "then ensure the order of the elements describing the sessions is identical in both NB Acquisition Compact frame and UWB Acquisition Compact frame" sounds more than a little bit like a requirement, or at least, a strong recommendation. Probably should state it as such? | Change to: the order of the elements describing the sessions should be identical in both NB Acquisition Compact frame and UWB Acquisition Compact frame. | Accepted |
| Benjamin Rolfe | 183 | 95 | 10.38.10.20.2  | ~~25~~22 | " If UWB Per-Session Info(s) field are included in both NB Acquisition Compact frame and UWB Acquisition Compact frame, then ensure the order of UWB Per-Session Info(s) is identical." sounds like a requirement, or at least a very strong recommendation. Should be stated as such (should or shall). | Change to: If UWB Per-Session Info(s) field are included in both NB Acquisition Compact frame 25 and UWB Acquisition Compact frame, then the order of UWB Per-Session Info(s) should be identical. | Accepted |

**Disposition Detail:**

Agree with the both proposed changes. So we changed as such as below



**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

***Change the text in P95L22 as follows (Track changes ON)***

Information of UWB channel usage per UWB session is given using UWB Per-Session Info List field. If UWB Per-Session Info List fields are included in both NB Acquisition Compact frame and UWB Acquisition Compact frame, thenthe order of the elements describing the sessions should be identical in both NB Acquisition Compact frame and UWB Acquisition Compact frame.

***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Carl Murray | 817 | 95 | 10.38.10.20.2 | 7 | What is the reference point for the time remaining in the following statement.The Next NB AP field indicates the time remaining in RSTU until the start of the next NB Acquisition Compact frame. |  | Revised |
| Bin Qian | 386 | 95 | 10.38.10.20.2 | 12 | If UWB AP Info is present, what is the time offset between the NB Acquisition Compact frame and the following UWB Acquisition Compact frame | As in the comment | Rejected |
| Bin Qian | 387 | 95 | 10.38.10.20.2 | 14 | If length 91 or length 127 Ipatov sequence is used, it is not necessary to allocate the Preamble Code field 1 Octet | As in the comment | Revised |
| Carl Murray | 818 | 95 | 10.38.10.20.2 | 19 | How is the preamble code encoded? |  | Revised |

**Disposition Detail :**



**CID #817 ;** The reference point from the ’start’ of current NB Acquisition Compact frame until the start of the next NB Acquisition Compact Frame.

**CID #386 ;** it’s ‘Delta T’. There is a typo.

**CID #387 ;** 127 Ternary Code Index in Table 16-8 ranges 9~24, while 91 Ternary Code Index in Table 16-9 ranges 25~32. Therefore, total code index ranges 9 to 32 which are 24 number of codes which requires 5 bits to express, not 1 octet.

However, we’d like to keep to assign 1 octet to express preamble code index as is, because just 3 bit saving is not that dramatic and for the future usage.

**CID #818 ;** We can map preamble code index as below.

|  |  |
| --- | --- |
| Preamble Code Index | Bit |
| 9 | 0x00 |
| 10 | 0x01 |
| 11 | 0x02 |
| …. | … |
| 32 | 0x17 |

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

***Change the text in P95L7 as follows (Track changes ON)***

…..

**For CID #817**

The Next NB AP field indicates the time remaining in RSTU from the start of current NB Acquisition Compact Frame until the start of the next NB Acquisition Compact frame. This field is omitted from the message when the NB AP Type field value is zero indicating periodic coordination.

The fields of the UWB AP Info appear in a fixed order; however, some fields may not be included in all frames. If UWB AP Info is present, the initiator shall send the UWB Acquisition Compact frame after the NB Acquisition Compact frame. The UWB AP Info field when present shall be formatted as shown in Figure 109.

|  |  |  |  |
| --- | --- | --- | --- |
| **Octets: 2** | **Bits: 0 – 4** | **5–7** | **Octets: 1** |
| Delta T | UWB Channel | Reserved | Preamble Code |

**Figure 109—Format of UWB AP Info field**

The Delta T field value gives the time in RSTU from the start of the current NB Acquisition Compact frame packet to the start of the next UWB Acquisition Compact frame packet.

**For CID #386**

The UWB Channel field specifies the UWB channel number, from Table 16-27 (*HRP UWB PHY band allocation*), on which the UWB Acquisition Compact frame is to be transmitted.

The Preamble Code field specifies the preamble code index to be used for the UWB Acquisition Compact frame transmission. The preamble code shall be selected from either the length 91 ternary codes given in Table 16-9 or the length 127 ternary codes given in Table 16-8. Code Index 9 corresponds to 0x00 and Code Index 32 corresponds to 0x17 in sequential order consecutively.

**For CID #818**

***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Li-Hsiang Sun | 39 | 96 | 10.38.10.20.1 | 8 | is preamble code index field also signals MMRS sequence code index?  | change to 'preamble code index/MMRS sequence code index' | Rejected |

**Disposition Detail:**

It signals preamble code index only.

MMRS specific information is signalled by several fields (ex. Ranging PHY config, Ranging MAC config) inside SOR.

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

***None***

***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Bin Qian | 388 | 96 | 10.38.10.20.2 | 3, 11, 20  | It is not necessary to allocate the Preamble Code Index field 1 Octet | As in the comment | Rejected |

**Disposition Detail:**

As in CID #387, CID #818, 127 Ternary Code Index in Table 16-8 ranges 9~24, while 91 Ternary Code Index in Table 16-9 ranges 25~32. Therefore, total code index ranges 9 to 32 which are 24 number of codes which requires max 5 bits to express NOT 1 octect.

However, 1 octet versus 5 bits are just 3 bits difference, and considering extensibility, we’d like to keep current structure as is.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Octets: 3**  | **Bits: 0–4**  | **5**  | **6–7**  | **Octets: 1**  |
| Block Duration  | UWB Channel  | Hop Mode  | Reserved  | Preamble Code Index  |

**Figure 110—Format of UWB Per-Session Info elements type 1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Octets: 3** | **Bits: 0–4** | **5–7** | **Octets: 1** | **3** |
| Delta T | UWB Channel | Reserved | Preamble Code Index | Active Period Duration |

**Figure 111—Format of UWB Per-Session Info elements, type 2**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Octets: 3** | **Bits: 0–4** | **5** | **6–7** | **Octets: 1** | **3** | **1** | **3** |
| Delta T | UWB Channel | Hop Mode | Reserved | Preamble Code Index | Round Duration | Number of rounds in the block | Active Rounds |

**Figure 112—Format of UWB Per-Session Info elements, type 3**

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

***None***

***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Bin Qian | 389 | 96 | 10.38.10.20.2 | 20 | The number of octets occupied by the Active Rounds could be larger than 3 octets, which depends on the Number of Rounds in the Block field value | As in the comment | Rejected |

**Disposition Detail:**

Currently, ‘the number of rounds in the block’ is assigned with 1 octet which means maximum 2^8 = 256 possible rounds in a block. Then, theoretically 32 octets(=256/8) are needed to indicate active rounds in a block as bitmap. But assigning 32 octets all the way is wasteful. So we’d like to just keep 3 octets per rounds as originally suggested. Otherwise. It’ll be much appreciated if you could suggest appropriate reasonable number.

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

***None***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Octets: 3  | Bits: 0–4  | 5  | 6–7  | Octets: 1  | 3  | 1  | 3  |
| Delta T  | UWB Channel  | Hop Mode  | Reserved  | ~~Preamble Code Index~~  | Round Duration  | Number of rounds in the block  | Active Rounds  |

**Figure 112—Format of UWB Per-Session Info elements, type 3**

The Delta T field indicates the time remaining in RSTU until the start of a block relative to the start of the current packet.

The UWB Channel field indicates the UWB channel number used by the UWB session.

The Hop Mode field specifies the hop mode for a block of UWB session, where zero means no hopping and one means hopping.

The Preamble Code index field indicates the preamble code used by the UWB session.

The Round Duration field is an unsigned integer that specifies the duration of a round in RSTU.

The Number of Rounds field is an unsigned integer that specifies the number of rounds in a block of the UWB session.

The Active Rounds field contains a binary bitmap string. Each bit maps to the rounds in the block of UWB session. The bit is set to one to indicate active, otherwise it is set to zero.

***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Pooria Pakrooh | 89 | 97 | 10.38.10.20.1 | 7 | How is the "active round" field defined and used when there is UWB round hopping? This info seems to be useless in the case of round hopping. | Clarify the definition of "active round" for the case that there is round hopping. | Rejected |

**Disposition Detail:**



Round hopping is assumed as below ;

“*it is assumed that as part of such function/protocol, the devices participating in the ranging exchange have either (a) pre-negotiated a hopping sequence that is known to all devices, or (b) have exchanged all the information necessary such that each device can generate the hopping sequence so that they know which ranging round in each ranging block is to be used if hopping is triggered.”*

Therefore, hopping pattern is already known both to initiator and responders, so even when round hopping is enabled, that is already applied to bitmap string. That is, when active rounds are determined and signalled, round hopping is considered.

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

***None***

***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Bin Qian | 393 | 97 | 10.38.10.20.3 | 21 | In periodic coordination, how to know the start of the next UWB Acquisition Compact frame | As in the comment | Revised |

**Disposition Detail:**

Make changes so that Next UWB AP also can be signalled even when periodic coordination.

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

1. ***Change the text in chapter 10.38.10.20.3 as follows (Track changes ON)***

**10.38.10.20.3 Acquisition Compact frame with Message Control field value of 0x10**

When the Acquisition Compact frame has a Message Control field value of 0x010 the Message Content field shall be formatted as shown in Figure 113. This is a UWB Acquisition Compact frame.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Bits: 0 – 2**  | **3–7**  | **8–10**  | **11 – 14**  | **15**  | **Octets: 2**  | **variable**  |
| UWB AP Type  | Reserved  | Type of UWB Per-Session Info  | Number of UWB Per Session Info  | Reserved  | Next UWB AP  | UWB Per-Session Info List  |
| Common Info |  |

**Figure 113—Format of the Message Content field in the Acquisition Compact frame when the Message Control field value is 0x10**

The fields of the Common Info appear in a fixed order; however, some fields may not be included in all frames.

The UWB AP Type field value when zero specifies periodic coordination, and when one specifies aperiodic coordination. Other values are reserved.

The Type of UWB Per-Session Info field shall have one of the non-reserved values given in Table 8 which determines the format of the UWB Per-Session Info field.

The Next UWB AP field, which is present when the UWB AP Type field value is either one or zero, gives the time remaining in RSTU until the start of the next UWB Acquisition Compact frame.

1. ***Change the text in chapter 10.38.10.20.3 as follows (Track changes ON)***

**10.38.10.20.2 Acquisition Compact frame with Message Control field value of 0x00**

When the Acquisition Compact frame has a Message Control field value is 0x00 the Message Content field shall be formatted as shown in Figure 108. This is an NB Acquisition Compact frame.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Bits: 0 – 2** | **3–7** | **8–10** | **11 – 14** | **15** | **Octets: 2** | **0/4** | **variable** |
| NB AP Type  | Reserved  | Type of UWB Per-Session Info  | Number of UWB Per Session Info  | UWB AP Info Present  | Next NB AP  | UWB AP Info  | UWB Per-Session Info List  |
| Common Info |  |  |

**Figure 108—Format of the Message Content field in the Acquisition Compact frame when** **the Message Control field value is 0x00**

The fields of the Common Info appear in a fixed order; however, some fields may not be included in all frames.

The NB AP Type field value when zero specifies periodic coordination, and when one specifies aperiodic coordination. Other values are reserved.

The Type of UWB Per-Session Info field shall have one of the non-reserved values given in Table 8 which determines the format of the elements of the UWB Per-Session Info List field.

…..

The Next NB AP field indicates the time remaining in RSTU until the start of the next NB Acquisition Compact frame.

***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Carl Murray | 823 | 97 | 10.38.10.20.2 | 7 | Does this entry require further information explaining how the order of bits maps to the order of rounds |  | Revised |

**Disposition Detail:**

****

Agreed.

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

***Change the text in chapter 10.38.10.20.2 as follows (Track changes ON)***

The Hop Mode field specifies the hop mode for a block of UWB session, where zero means no hopping and one means hopping.

The Preamble Code index field indicates the preamble code used by the UWB session.

The Round Duration field is an unsigned integer that specifies the duration of a round in RSTU.

The Number of Rounds field is an unsigned integer that specifies the number of rounds in a block of the UWB session.

The Active Rounds field contains a binary bitmap string. Each bit maps to the rounds in the block of UWB session. The bit is set to one to indicate active, otherwise it is set to zero. The most significant bit (MSB) corresponds to the first round of the block and the least significant bit((LSB) corresponds to the last round of that block.

***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Rojan Chitrakar | 680 | 145 | 10.43.2 | 19 | Is this part of the example or a normative requirement? | If it is part of the example, rewrite without shall and may. If it is normative, write for better clarity, e.g., what is "time offset", what is "NB packet"? | Revised |

**Disposition Detail:**

****

Originally, intended just as an example. But to avoid confusion, we suggest remove corresponding parts.

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

***Remove the sentences from line 19 to line 21.***

***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Bin Qian | 454 | 146 | 10.43.3.1 | 1 | It is not clear the unit of the Transmission Offset field | As in the comment | Accepted |
| Pooria Pakrooh | 113 | 146 | 10.43.3.1 | 11 | Specify the unit of "transmissions offset" field. | Specify the unit of "transmission offset" field. | Accepted |
| Rojan Chitrakar | 681 | 146 | 10.43.3.1 | 11 | What is the unit for Transmission Offset? | as in comment | Accepted |

**Disposition Detail:**

****

****

Intended in RSTU

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

***Change the text in chapter 10.43.3.1 as follows (Track changes ON)***

The Address field identifies the participating device. The size of the Address field is specified by the Address Size field.

The NB Channel field is used to assign a NB channel index to the device identified by the address field.

The NB PHY field specifies the NB PHY configuration index. The NB PHY field value shall be one of the Config number values from Table 45.

The Transmission Offset field specifies the time until the start of the NB packet in the channel specified by the NB Channel field in RSTU. This offset is relative to the start of the NB allocation packet.

***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Bin Qian | 452 | 146 | 10.43.3.1 | 5 | Which cases the device can have a 2-octet address | As in the comment | Rejected |

**Disposition Detail:**

****

The length of short address defined in 15.4-2020 is 2-octet.

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

***None***

***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Bin Qian | 453 | 146 | 10.43.3.1 | 1 | Why does the NB Channel field occupy 2 octets. Given 250 NB channels, 1 octet is sufficient | As in the comment | accepted |

**Disposition Detail:**

****

Agreed.

**Proposed text changes on P802.15.4ab™/D (pre-ballot) C:**

***Change the Figure 169 as follows (Track changes ON)***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Bits: 2** | **6** | **Octets: 2/3/8** | **1** | **1** | **4** |
| Address Size | Reserved | Address | NB Channel | NB PHY | Transmission Offset |

**Figure 169—NB Allocation IE Content field format**