**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#:** **146, 302, 196, 303, 304, 305, 585, 586, 587, 588, 306, 307, 308, 530, 591, 592, 6, 595, 596, 597, 562, 604, 563, 564, 327, 623, 25** |
| Date Submitted | Mar 2024 |
| Sources | Youngwan So (SAMSUNG Elec.)youngwan.so@samsung.com |  |
| Re: |   |
| Abstract |  |
| Purpose | To propose resolution for miscellaneous hyper block related comments 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: Initial version.

 CID#: 146, 302, 196, 197, 303, 304, 305, 585, 586, 587, 588, 306, 307, 310, 198, 199, 308, 530, 591, 592, (311), (593), 594, 200, 294, 313, 6, 595, 596, 597, 562, 604, 563, 564, 327, 623, 25, (26), (27), (333)

※ Note :

* CID ordered based on page number.
* Strikethrough line : New assignee needed
* Parentheses : Not covered yet

***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 | 146 | 29 | 10.31.2  | 19 | Either an Imm-Ack or Enh-Ack could be expected based on the data frame sent (version 1 or 2); In block mode, the information needed to know that this is block mode is conveyed in information elements (data frame version 2). See [Rev E D1 6.6.2] Reception and rejection. What about the case where Enh-Ack is expected? Seems we need the same conditions met.  | Change to : in the case where an acknowledgement is expected… | Accepted |

**Disposition:** Accepted

**Disposition Detail:**

Agree. Seems we need the same condition for both of them.

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

**10.31.2 Ranging block and round structure**

***Change paragraph one of 10.31.2 as shown:*** 14

A ranging block is a time period for ranging. Each ranging block consists of a whole number of ranging rounds, where a ranging round is a period of sufficient duration to complete one entire range-measurement cycle involving the set of ERDEVs participating in the ranging exchange. Each ranging round is further subdivided into an integer number of ranging slots where a ranging slot is a time period of sufficient duration for the transmission of at least one RFRAME, or, in the case where an acknowledgement is expected, of sufficient duration for the transmission of at least two RFRAMEs as shown in Figure 5. Figure 10-220 shows the ranging block structure. In this figure, the ranging block is divided into N ranging rounds, each consisting of M ranging slots. The slot duration and the number of slots making up a ranging round can be changed between ranging rounds. This can be achieved by the controller.

***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 | 302 | 29 | 10.31.1 | 9 | Some fields are in both the ARC IE and the AC IE, e.g., Multi-node Mode field, Ranging Round Usage field, STS Packet Config field, Deferred Mode field, and MMRCR field. If both ARC IE and AC IE exist in RCM, which IE will the controlee follow? | Clarify how the ARC IE and AC IE coexist | Revised |

**Disposition:** Revised

**Disposition Detail:**

Both of Common Ranging Control field at AC IE and ARC IE are as follows;

1. AC IE





1. ARC IE



Both of ARC IE and AC IE are commonly transmitted by controller. Among many parameters delivered by them, red color-coded boxes above are overlapping ones.

By definition (P111L27), configuration information in AC IE is supposed to be used by every application (ex. MMS, Sensing, etc) and application-specific control parameters. On the other hand, configuration information in ARC IE is mainly for ranging application purpose (P78L11@4z).

Therefore, not sure but it may be probable to think both of ARC IE and AC IE seldom appear at the same time. But if there are cases that both appear concurrently, it’s reasonable for parameter values both of ARC IE and AC IE are for configuration of 4z/4ab devices, while those of AC IE are for 4ab-based devices only.

More importantly, this is mentioned already in sensing part (P116L11) as below ;

 

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

**10.31 Ranging: Multi-node ranging**

**10.31.1 Introduction**

***Change the first paragraph of 10.31.1 as shown:***

The use and support of the procedures and associated IEs in this subclause are optional. An RCM is a data frame conveying the either an Advanced Ranging Control IE (ARC IE) described in 10.31.9.1 or an Application Control IE (AC IE) carrying a Ranging Control field (as described 10.39.7.1) or both. The RCM can be used to convey ranging parameters to control and configure aspects of the ranging procedure(s) such as the timeslot structure shown in Figure 10-220, the ranging methods specified in 10.28.1.2, and the STS packet configuration as specified in 16.2. If both of ARC IE and AC IE are conveyed at the same time, the parameter values in ARC IE are for 4z-based ranging configuration and those of AC are for MMS-based ranging configuration."

***Or No change***

***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** |
| Billy Verso | 196 | 30 | 10.31.2 | 5 | "in case there will be more than one RCM transmitted" sounds like a precaution. The meaning here should be clearer. The phrase at the end of the sentence it is not needed. | Change inserted underlined phrase to: ", or additionally transmitted by other devices in other ranging slots of the ranging round". |  Accepted |

**Disposition:** Accepted

**Disposition Detail:**



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

The following nomenclature is used for messages:

⎯ Ranging Control Message (RCM): A message transmitted by a controller in slot zero, the first slot of a ranging round to configure ranging parameters, or additionally transmitted by other devices in other ranging slots of the ranging round.

***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** |
| Billy Verso | 197 | 30 | 10.31.2 | 5 | To explain the notion of multiple devices sending RCM messages, it would be good to cross reference a description that explains how receipt of RCM is handled in a device potentially receiving different RCM from multiple sources. | If not already present, insert description text in an appropriate subclause. Cross reference the description from here. |   |

**It seems I am not the right person to answer 197. Probably sensing issue but not sure.**

**It’ll be much appreciated if this can be assigned to other good experts.**

***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 | 1 | 31 | 10.31.3.5 | 18 | "When block assignment scheduling (as specified by the Scheduling IE, defined in 10.31.9.10)is not used,", should Bitmap-based block scheduling also be excluded (for hopping within the same block index)? | Change to "When block assignment scheduling or bitmap-based block scheduling (as specified by the Scheduling IE, defined in 10.31.9.10)is not used," or revise the requirement as suggested in the next CID |   |

**Assignee changed : Youngwan 🡪 Hongwon**

***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 | 303 | 31 | 10.31.3.5 | 7 | Does the configuration of HBS IE take effect in the current hyper block or the next hyper block. It seems that the HBS IE takes effect in the current hyper block. It is better to make it more clear. | Clarify when the HBS IE take effect | Revised |

**Disposition:** Revised

**Disposition Detail:**

The HBS IE is expected to take effects from the corresponding hyper block as RCM is supposed to do so which HBS IE resides at..

So will add the following sentence at the end of Line#7 at Page #31:

"The HBS IE takes effects from the current hyper block where HBS IE exists."

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

**10.31.3.5 Hyper block mode**

The configuration for the hyper block structure may be repeatedly transmitted in every RCM by the controller. The Hyp er Block Structure IE (HBS IE), as defined in 10.31.9.12, may be used to signal the durations of each of the ranging blocks in the hyper block. The RCM with HBS IE may be transmitted in the first slot in every hyper block. The HBS IE specifies the index of the corresponding ranging block and includes a list of the durations of all the ranging blocks within the hyper block. Optionally, round duration and slot duration may also be specified in the HBS IE. On reception of an HBS IE with the RCM, a controlee may assume that hyper block structure is followed. The HBS IE takes effects from the corresponding hyper block where HBS IE exists. Each block structure may be setup by specifying the Ranging Block Duration field, the Ranging Round Duration field, and the Ranging Slot Duration field in the HBS IE and/or the ARC IE within the RCM. The hyper block structure is determined by the next higher layer.

***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 | 304 | 31 | 10.31.3.5 | 9 | If both ARC IE and HBS IE exist in RCM, which IE will the controlee follow? | Clarify how the ARC IE and HBS IE coexist | Revised |

**Disposition:** Revised

**Disposition Detail:**

Both of ARC IE and HBS IE are as follows;

1. ARC IE



1. HBS IE





Among the fields, block duration, round duration and slot duration are duplicate.

And, 4z ranging can run in hyper block. So there may be cases that ARC IE and HBS IE co-exists within a RCM and parameters inside should be coordinated.

Therefore, add the following sentence at the end of sentence in line#9.

" If the HBS IE and the ARC IE are both present in the same RCM, the ranging parameters are jointly configured by the HBS IE and the ARC IE, The common parameter should exist in either ARC IE or HBS IE, and present field should be set to zero to indicate that the corresponding field is not present in case that the field doesn’t exist in the IE."

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

**10.31.3.5 Hyper block mode**

The configuration for the hyper block structure may be repeatedly transmitted in every RCM by the controller. The Hyp er Block Structure IE (HBS IE), as defined in 10.31.9.12, may be used to signal the durations of each of the ranging blocks in the hyper block. The RCM with HBS IE may be transmitted in the first slot in every hyper block. The HBS IE specifies the index of the corresponding ranging block and includes a list of the durations of all the ranging blocks within the hyper block. Optionally, round duration and slot duration may also be specified in the HBS IE. On reception of an HBS IE with the RCM, a controlee may assume that hyper block structure is followed. Each block structure may be setup by specifying the Ranging Block Duration field, the Ranging Round Duration field, and the Ranging Slot Duration field in the HBS IE and/or the ARC IE within the RCM. If the HBS IE and the ARC IE are both present in the same RCM, the ranging parameters are jointly configured by the HBS IE and the ARC IE, The common parameter should exist in either ARC IE or HBS IE, and present field should be set to zero to indicate that the corresponding field is not present in case that the field doesn’t exist in the IE. The hyper block structure is determined by the next higher layer.

***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 | 305 | 31 | 10.31.3.5 | 24 | Regarding round hopping, it seems that the text description in Line 20-21 and Figure 7 are contradictory. Accroding to the text description, the transmissions cannot occur between rounds with the same index in two adjacent Hyper blocks. However, in Figure 7, transmissions occur at 1st round in n-th block within (k+1)th hyper block and (k+2)th hyper block | Clarify if transmissions can occur between rounds with the same index in two adjacent Hyper blocks | Revised |

**Disposition:** Revised

**Disposition Detail:**

The comment is correct. The diagram is drawn mistakenly.

The dotted arrow that comes from Round 1 in hyper block k+1 SHOULD NOT go to Round 1 again, BUT go to somewhere another round. So I removed arrow that makes confusion. Revised and attached below :.

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



**REDRAWN FIGUIRE IS HERE : **

***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 | 585 | 31 | 10.31.3.5 | 4 | "The HBS IE specifies the index of the corresponding ranging block and …"Since each hyperblock contains multiple ranging blocks, it is not clear what does the index of the corresponding ranging block mean here. | Change to:"The HBS IE specifies the index of the corresponding hyper block…" | Accepted |

**Disposition:** Accepted

**Disposition Detail:**

 Agreed. It’s typo.

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

…

The configuration for the hyper block structure may be repeatedly transmitted in every RCM by the controller. The Hyper Block Structure IE (HBS IE), as defined in 10.31.9.12, may be used to signal the durations of each of the ranging blocks in the hyper block. The RCM with HBS IE may be transmitted in the first slot in every hyper block. The HBS IE specifies the index of the corresponding hyper block and includes a list of the durations of all the ranging blocks within the hyper block. Optionally, round duration and slot duration may also be specified in the HBS IE. On reception of an HBS IE with the RCM, a controlee may assume that hyper block structure is followed. Each block structure may be setup by specifying the Ranging Block Duration field, the Ranging Round Duration field, and the Ranging Slot Duration field in the HBS IE and/or the ARC IE within the RCM. The hyper block structure is determined by the next higher layer.

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***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  | Revised |

**Disposition:** Accepted

**Disposition Detail:** Accepted / Revised

* Agreed Rojan’s both resolutions for 586 and 587 as is, and rephrase paragraph in L17 P31 as follows ;

**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.

Every Hyper block keeps the same internal structure as repeated. Round Hopping is optional in hyper block mode. For round hopping in hyper block mode, the controlee may hop to one of round at the block having the same block Index number in the next hyper block. For example, transmission at m-th Round in n-th Block within k-th Hyper Block hops to p-th Round in n-th Block within (k+1)-th Hyper Block, (m not equal to p) as shown in Figure 7, when block assignment scheduling (as specified by the Scheduling IE, defined in 10.31.9.10) 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** |
| Hong Won Lee | 529 | 32 | 10.31.9.3 | 29-30 | RR IE signalling rule is not described for hyper block mode | RR IE signalling method should be additionally described for the hyper block modeProposed change text is 15-24-0003-00-04ab-proposed-change-for-RR-IE.doc |   |

**Assignee changed : Youngwan 🡪 Hongwon**

***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 | 4 | 33 | 10.31.9.3 | 14 | "The RR IE is used in block-based mode and in hyper block mode without block assignment scheduling." should Bitmap-based block scheduling also be excluded for hopping within the same block index?  | Change L14 to "The RR IE is used in block-based mode and in hyper block mode with neither block assignment scheduling nor bitmap-based scheduling". Change L2 to "In hyper block mode, when neither block assignment scheduling (as described in 10.31.9.10 Scheduling IE) nor bitmap-based block scheduling is used, the Ranging Block Index field is assumed to specify Hyper Block Index for the ranging hyper block 4 and controlee may assume the block index will be the same with previous hyper block." |   |

**Assignee changed : Youngwan 🡪 Hongwon**

***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 | 306 | 33 | 10.31.9.3 | 12 | If Imm-ACK is expected, the maximum value of offset shall be the ranging slot duration minus the packet duration, minus AIFS, and minus the Imm-ACK duration | As in the comment | Rejected |

**Disposition:** Rejected

**Disposition Detail:**

RR IE is not supposed to have ack.

**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 | 307 | 33 | 10.31.9.10 | 23 | Suggest to switch the order of the Scheduling List Length field and the Scheduling List Type field, since the format of the Scheduling List field depends on the value of the Scheduling List Type field | As in the comment | Accepted |

**Disposition:** Accepted

**Disposition Detail:** Accepted

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

Change Figure 9 as below;

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Bits: 0-2** | **3-6** | **7** | **8** | **9-15** | **Octets: Variable** |
| Scheduling List Type | Scheduling List Length | Address Size | Receiver Address Present | Reserved | Scheduling List |

***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 | 310 | 33 | 10.31.9.10 | 23 | It seems the receiver address is redundant since it is already in the MAC header | Remove the Receiver Address Present field and Receiver Address field in the Scheduling List field |  |

**It seems I am not the right person to answer 310.**

**It’ll be much appreciated if this can be assigned to other good experts.**

***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** |
| Billy Verso | 198 | 34 | 10.31.9.10 | 17 | Phrase is slightly unclear, I recommend modification as per proposed change. Assuming I have taken the correct meaning.  | Change "multiple blocks may be scheduled to a device by using one Scheduling List element." to  |  |

**It seems I am not the right person to answer 198.**

**It’ll be much appreciated if this can be assigned to other good experts.**

***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** |
| Billy Verso | 199 | 34 | 10.31.9.10 | 19 | Sentence beginning with "For example," is long and is not clear in meaning. | Sentence should be reworded/clarified, perhaps as a number of shorter sentences.  |  |

**It seems I am not the right person to answer 199.**

**It’ll be much appreciated if this can be assigned to other good experts.**

***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 | 308 | 34 | 10.31.9.10 | 2 | Suggest to change "Bitmap-based scheduling" to "Bitmap-based slot scheduling" when the value of the Scheduling List Type field is 2 to better distinguish "Bitmap-based block scheduling" | As in the comment | Accepted |

**Disposition:** Accepted

**Disposition Detail:** Accepted;

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

**Table 4—Values of Scheduling List Type field in the Scheduling IE**

|  |  |
| --- | --- |
| **Scheduling List Type** **field value**  | **Meaning**  |
| **0** | Per-slot scheduling |
| **1** | Consecutive slot scheduling |
| **2** | Bitmap-based slot scheduling |
| **3** | Periodic scheduling |
| **4** | Ranging sequence fragment (RSF) scheduling |
| **5** | Bitmap-based block scheduling |
| **6** | Block assignment scheduling |
| **7** | Reserved |

***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** |
| Hong Won Lee | 530 | 34 | 10.31.9.10 | 20 | The reference of behavior for HBS IE should be indicated correctly. The subsection 10.31.9.12 is definition of the HBS IE, however there is no description of transmission cycle. It is described in the subsection 10.31.3.5 | Change from "For example, Scheduling IE with Scheduling List Type 5 may be transmitted with same cycle of HBS IE, defined in 10.31.9.12, for hyper block mode scheduling and the bitmap in each Scheduling List element represents scheduled blocks to a single device in a hyper block." to "For example, Scheduling IE with Scheduling List Type 5 may be transmitted with same cycle of HBS IE, as described in 10.31.3.5, for hyper block mode scheduling, and the bitmap in each Scheduling List element represents scheduled blocks to a single device in a hyper block." | Accepted |

**Disposition:** Accepted

**Disposition Detail:** Accepted

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

…..(P34L19)

For example, Scheduling IE with Scheduling List Type 5 may be transmitted with same cycle of HBS IE, defined in 10.31.3.5,, for hyper block mode scheduling and the bitmap in each Scheduling List element represents scheduled blocks to a single device in a hyper block.

……

***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 | 591 | 35 | 10.31.9.10 | 7 | Sentence can be rephrased for better clarity. | Rephrase as:"If the Receiver Address Present field is one, the Receiver Address field is present. Otherwise, the Receiver Address field is not present." | Accepted |

**Disposition:** Accepted

**Disposition Detail:** Accepted;

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

…..

If the Receiver Address Present field is one, the Receiver Address field is present. Otherwise, the Receiver Address field is not present.

……

***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 | 592 | 36 | 10.31.9.10 | 16 | "The first slot to be scheduled corresponds to the first bit in the bitmap."Clarify that the bitmap is the Scheduling Bitmap field. | Rephrase as:"The first slot to be scheduled corresponds to the first bit of the Scheduling Bitmap field." | Accepted |

**Disposition:** Accepted

**Disposition Detail:** Accepted;

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

**…..**

The Bitmap Offset field specifies the number of slots between the slot on which the Scheduling IE is sent and the first slot to be scheduled. The first slot to be scheduled corresponds to the first bit of the Scheduling bitmap field. For example, if the Scheduling IE is sent in slot index zero and the Bitmap Offset field is set to five, then the first bit of the bitmap corresponds to a slot index of six.

**…..**

***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 | 594 | 37 | 10.31.9.10 | 21 | Table 5 allows a maximum bitmap length of 64 bits, however block index field may be 1 or even 2 octets, meaning there will be more than 64 blocks per hyper block. How are the rest of blocks (with index > 64) signaled? | The Block scheduling Bitmap Length field should be larger to signal all the blocks in a hyper block. |  |

**It seems I am not the right person to answer 594.**

**It’ll be much appreciated if this can be assigned to other good experts.**

***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** |
| Billy Verso | 200 | 38 | 10.31.9.10 | 8 | I think this needs some clarification. Would these IEs be used in the same frame? What role has RDM IE if the Scheduling IE is present? RDM was introduced by 4z while Scheduling IE is new and would not be understood by older devices. Is there any need for / thoughts on backward compatibility interworking with older devices? | Add/refer to appropriate operational description that explains the usage / addresses these concerns. |  |
| Carlos Aldana | 294 | 38 | 10.31.9.10 | 8 | Due to its inefficiency, the RDM IE should not be present in the same frame as the scheduling IE.  | Replace sentence in lines 8-9 with "An RDM IE shall not be used in the same frame as a scheduling IE. The Scheduling IE shall be used for scheduling." |  |
| Bin Qian | 313 | 38 | 10.31.9.10 | 8 | Does it mean when there are both Scheduling IE and RDM IE, 4ab device will follow Scheduling IE and 4z device will follow RDM IE? | Clarify the case in the comment |  |

**It seems I am not the right person to answer 200, 294, 313.**

**It’ll be much appreciated if this can be assigned to other good experts.**

***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 | 6 | 39 | 10.31.9.12 | 12 | The presence of ranging round duration and ranging slot duration should be specified such thatIf Ranging Block Duration Units is 0, then both Ranging Round Duration and Ranging Slot duration must be presentIf Ranging Block Duration Units is 1, and ERR IE (cross block round hopping) is not used, then Ranging Slot duration must be presentIf Ranging Block Duration Units is 1 or 2 and ERR IE (cross block round hopping) is used, then both Ranging Round Duration and Ranging Slot duration must be present | as in comment | Revised |
| Rojan Chitrakar | 596 | 40 | 10.31.9.12 | 9 | The unit choosen for the "Ranging (missing here)" Block Duration field will determine whether the Round Duration field and the Slot Duration field are present or not, e.g., if the unit is in terms of number of rounds, then the Round Duration field shall be present; if the unit is in terms of number of slots, the Slot Duration field shall be present. This relationship may not be obvious and needs to be explicitely specified in thes specs. | Specify the relationship between the unit of the Block Duration field and the presence of the Round Duration field and the Slot Duration field. |  |

**Disposition:** Revised

**Disposition Detail:**

****

****

Both of above CID#6 and CID#596 are talking about necessity of clear description about relationship between the unit of the block duration and the presence of the other two fields, i.e. round duration and slot duration.

Controller can choose any of the units in its favour, i.e. the number of rounds (=units field value 0), the number of slots (=units field value 1) or RSTU (=units field value 2). Basically, all those 3 values (Block, Round, Slot Duration) are recommended to be present at HBS IE at the same time. But, as the hyper block structure is supposed to repeat the same, round duration and slot duration can be omitted by setting ‘Round Duration Presence’ and ‘Slot Duration Presence’ bit to be zero and refer the values from previous hyper blocks which has the value.

Add the proposed paragraph after the P39L9 ;

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

…. (P39L9)

The Ranging Block Duration Units field indicates the Ranging Block Duration field size as per Table 6. Controller can choose any of the units in its favour, i.e. the number of rounds (=units field value 0), the number of slots (=units field value 1) or RSTU (=units field value 2). Basically, all those 3 values (Block, Round, Slot Duration) are recommended to be present at HBS IE at the same time. But, as the hyper block structure is supposed to repeat the same, round duration and slot duration can be omitted by setting ‘Round Duration Presence’ and ‘Slot Duration Presence’ bit to be zero and refer the values from the most recent previous hyper blocks which has the value.

**Table 6—Ranging Block Duration Units field**

|  |  |
| --- | --- |
| **Ranging Block Duration Units field value** | **Description** |
| 0 | Size of Ranging Block Description List Length field is 1 octet and the Ranging Block Description List field units are the number of ranging rounds.  |
| 1 | Size of Ranging Block Description List Length field is two octets, and the Ranging Block Description List field units are the number of slots  |
| 2 | Size of Ranging Block Description List Length field is three octets, and the Ranging Block Description List field units are in RSTU.  |
| 3 | Reserved  |

The Ranging Round Duration Presence field indicates the presence of the Round Duration field when it is”1”, and it is not present when it is “0” as per Figure 20.

The Ranging Slot Duration Presence field indicates the presence of the Slot Duration field when it is “1”, and it is not present when it is “0” as per Figure 20.

Ranging Block Description List Length field specifies the number of Ranging Block Description List elements in the Ranging Block Description List field. The number of Ranging Block Description List Elements shall be set equal to the number of blocks in the hyper block.

Ranging Block Description List field contains Ranging Block Description List elements each of which is structured as per Figure 20.

|  |  |  |  |
| --- | --- | --- | --- |
| **Octets: 2** | **1/2/3** | **0/1** | **0/2** |
| Ranging Block Index | Ranging Block Duration | Ranging Round Duration | Ranging Slot Duration |

**Figure 20—Ranging Block Description List field format**

The Ranging Block Index field specifies the index of the ranging block within the hyper block.

The Ranging Block Duration field is an unsigned integer that specifies the duration of the ranging block. The size and the unit of the Block Duration field is determined by the Unit of Block Duration field as per Table 6.

The Ranging Round Duration field is an unsigned integer that specifies the duration of the round in units of slots, which is the number of slots in the round.

The Ranging Slot Duration field is an unsigned integer that specifies the duration of a slot in RSTU.***Comment Indices in 15-24-0010-01-04ab-consolidated-comments-draft-c:***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Rojan Chitrakar | 595 | 40 | 10.31.9.12 | 6 | 1 octet is sufficient for the Ranging Block index field. Within a Hyper block 256 blocks is more than enough. Note: In both ERR IE and Scheduling List elment Type 6, the Rangin Block Index is 1 octet only. | Change the Block Index field size to 1 octet | Rejected |

**Disposition:** Rejected

**Disposition Detail:**

****

With the existing block indexing way (= BI resets to 0 at the end of every hyper block), it was supposed to be changed into 1 octet, as 2 octets are too long. But now, for several reasons, there’ll be modification so that Block Index is monotonically increasing without reset, so it seems had better to be kept as is.

**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** |
| Rojan Chitrakar | 597 | 40 | 10.31.9.12 | 11 | How are the Ranging Round duration and Slot duration signalled if these fields are not present? | as in comment | Rejected |

**Disposition:** Revised

**Disposition Detail:**

The Round Duration and Slot Duration can be referred from the most recent previous hyper blocks which has the corresponding values.

**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** |
| Youngwan So | 562 | 44 | 10.38.3.2 | 33 | The channel specified by "default value of" the macMmsNbInitChannel attribute and the channel specified by "default value of" the macMmsUwbChannel attribute shall be used for coordination | Change"the initiator may scan the channel specified by themacMmsNbInitChannel attribute and the channel specified by the macMmsUwbChannel attribute before ~"to"**For coordination of channel use**, the initiator **shall** scan the channel specified by the **default value of** macMmsNbInitChannel attribute and/or the channel specified by the **default value of** macMmsUwbChannel attribute before ~" | Revised |
| Youngwan So | 563 | 49 | 10.38.3.6 | 41 | The channel specified by "default value of" the macMmsNbInitChannel attribute and the channel specified by "default value of" the macMmsUwbChannel attribute shall be used for coordination | Change"The initiator transmits the NB Acquisition Compact frame in the initialization channel specified by the macMmsNbInitChannel attribute and transmits the UWB Acquisition Compact frame in the channel specified by the macMmsUwbChannel attribute."to "The initiator transmits the NB Acquisition Compact frame in the initialization channel specified by the **default value of** macMmsNbInitChannel attribute and transmits the UWB Acquisition Compact frame in the channel specified by the **default value of** the macMmsUwbChannel attribute." | Revised  |
| Youngwan So | 564 | 50 | 10.38.3.6 | 3 | The channel specified by "default value of" the macMmsNbInitChannel attribute and the channel specified by "default value of" the macMmsUwbChannel attribute shall be used for coordination | Change"If coordination is active, before starting a new session, the initiator scans for Acquisition Compact frame on the initialization channel specified by the macMmsNbInitChannel attribute and/or the channel specified by the macMmsUwbChannel attribute."to "If coordination is active, before starting a new session, the initiator scans for Acquisition Compact frame on the initialization channel specified by the **default value of** macMmsNbInitChannel attribute and/or the channel specified by the **default value of** macMmsUwbChannel attribute." | Revised |

**Disposition:** Revised

**Disposition Detail:**

**( It seems I am the right person to answer 562, 563, 564.**

**It’ll be much appreciated if this can be assigned from Jinjing to Youngwan )**

However, regarding NB channel for coordination purpose, we think common one channel over the initiators nearby is strongly preferred, so to make those initiators hear news (= nearby resource usage information) through common one channel. Otherwise, initiators may have to scan and listen to many multiple NB channels which may lead to inefficiency.

Therefore, differently from NB channel for initialization purpose and control purpose, at least, NB channel for coordination purpose should be common for all the initiators. That’s why we specifically pointed out one channel with default value of NB and UWB channel.

We don’t propose SHALL but propose only “default value of ….. “

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

***….***

**10.38.3.2 Session initialization (CID#562)**

***Change the text in P44L33 as follows (Track changes ON)***

***…***

If the coordination is active, the initiator determines the configuration for the ranging session based on knowledge of UWB channel usage learned from acquisition packets (APs) received from other initiators as described in 10.38.3.6. Once the coordination is enabled, the initiator may scan the channel specified by the default value of *macMmsNbInitChannel* attribute and the channel specified by the default value of *macMmsUwbChannel* attribute before transmitting the Start of Ranging Compact frame so to avoid scanning all the candidate channels. To perform scanning for coordination and defer the transmission of the Start of Ranging Compact frame, the initiator sends an Advertising Confirmation Compact frame with the time offset between the first symbol of the Advertising Confirmation Compact frame and the first symbol of the Start of Ranging Compact frame. This is illustrated in Figure 24.

**10.38.3.6 Coordination (CID#563 and #564)**

***Change the text in P49L41 as follows (Track changes ON)***

***…***

The initiator transmits the NB Acquisition Compact frame in the initialization channel specified by the default value of *macMmsNbInitChannel* attribute and transmits the UWB Acquisition Compact frame in the channel specified by the default value of *macMmsUwbChannel* attribute. The NB Acquisition Compact frame and UWB Acquisition Compact frame are described in 10.38.10.20. To provide the information of UWB channel usage, both NB Acquisition Compact frame and UWB Acquisition Compact frame include the UWB Per-Session Info Fields. The higher layer determines a suitable interval between Acquisition Compact frames. If coordination is active, before starting a new session, the initiator scans for Acquisition Compact frame on the initialization channel specified by the default value of *macMmsNbInitChannel* attribute and/or the channel specified by the default value of *macMmsUwbChannel* attribute. The length of the scanning period is implementation dependent. The initiator thus obtains information of UWB channel usage from other initiators, and with this knowledge, the initiator may select values for configuring its new session to minimize the overlap with active periods of other sessions nearby. The details of this implementation specific.

***…***

***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 | 604 | 45 | 10.38.3.2 | 1 | "To perform scanning for coordination…"Very long sentence, difficult to parse. Is the Advertising Confirmation sent in the slot right after the Advertising Response? It seems so from the figure but is not specified as such. | Break into shorter sentences for better clarity and also specify whether the Advertising Confirmation is sent in the slot right after the Advertising Response. | Revised |

**Disposition:** Revised

**Disposition Detail:**

****

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

(P45L1)

To perform scanning for coordination and defer the transmission of the Start of Ranging Compact frame, the initiator sends an Advertising Confirmation Compact frame with the time offset. The time offset indicates the period between the first symbol of the Advertising Confirmation Compact frame and the first symbol of the Start of Ranging Compact frame. This is illustrated in Figure 24.

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

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Bin Qian | 327 | 61 | 10.38.9.3 | 22 | The figure is not clear to read | Redraw Figure 39 | Accepted |
| Rojan Chitrakar | 623 | 61 | 10.38.9.3 | 23 | The resolution of Figure 39 is too low; replace with a better resolution one. | as in comment | Accepted |

**Disposition:** Revised

**Disposition Detail:**

Redrawn and attached below

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

(P45L1)





***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 | 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:** 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.

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

(P62L8)

**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 be orthogonal enough 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.