**IEEE P802.15**

**Wireless Specialty Networks**

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| Project | IEEE P802.15 Working Group for Wireless Specialty Networks (WSNs) |
| Title | Comment Resolutions – 169, 265, 405, 408, 572  |
| Date Submitted | 14-May-2025 |
| Source | Youngwan So (SAMSUNG ELECTRONICS]youngwan.so@samsung.com |  |
| Re: | Comments:  |
| Abstract | This document is to suggest changes addressing comments below : 169, 265, 405, 408, 572 |
| Purpose | Resolve comments |
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Revision 0 : Addressing the following CIDs ;

169, 265, 405, 408, 572

***Comment Indices in 15-25-0174-00-04ab-consolidated-comments-draft-2.0:***

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| **Name** | **Index#** | **Pg** | **Sub-Clause** | **line** | **Comment** | **Proposed Change** |
| PANPAN, LI | 265 | 47 | 10.32.3.1 | 6 | Here only mention the difference between block-based and interval-based mode, with mentioning hyper block mode. Although intuitively hyper block mode should be same with block mode, but better clarify. | As in comment |

**Disposition :** Revised

**Disposition Detail:**



The comment is valid. The most of relevant details are already described in “10.32.3.5 Hyper block mode” section. But the brief difference information among those three modes can be a great help probably the comment intended. So the following additional information is provided.

**Proposed text changes on P802.15.4ab™/Draft 2.0 :**

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| ***Change 10.32.3.1 P53L17 as below ;***6 The key difference between block-based mode and interval-based mode is that the mean time between7 successive ranging rounds in block-based mode is assumed to be constant (i.e., using a time structure with 8 uniform spacing), while interval-based mode adopts a time structure with adaptive spacing, and the time 9 between successive ranging rounds may vary dynamically. A hyper block is a group of successive ranging blocks, and the time between successive ranging blocks in hyper block based mode is assumed to be non-uniform while the time between successive ranging rounds inside a block is uniform. The details of Hyper block mode is described in 10.32.3.5.10 The next higher layer of the controller selects the mode and the corresponding time structure. A device shall 11 operate in only one ranging mode at a time. This selection may be achieved by an out-of-band mechanism 12 or in-band using the Time Structure Indicator in the ARC IE as described in 10.32.9.1. |

***Comment Indices in 15-25-0174-00-04ab-consolidated-comments-draft-2.0:***

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| **Name** | **Index#** | **Pg** | **Sub-Clause** | **line** | **Comment** | **Proposed Change** |
| VERSO, BILLY | 405 | 67 | 10.39.3.2 | 21 | The paragraph is hard to understand, I think a word is missing. Maybe "before" is needed between "10.39.3..3" and "transmitted", but I think better to have this final phrase at the start of the paragraph. | Change it say "Before transmitting the Start of Ranging Compact frame, if coordination is active, ... " and delete "transmitting the Start of Ranging Compact frame" at the end of the paragraph. |

**Relevant Text :**



**Disposition Detail :**

The comment is thought to be correct and I also agree with.

Based on this, the following changes are suggested.

**Disposition:** Accepted

**Proposed text changes on P802.15.4ab™/Draft 2.0 :**

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| ***Change 10.39.3.2 P67L21 as below ;***19 Before transmitting the Start of Ranging Compact frame, if coordination is active, the initiator determines the configuration for the ranging session based on knowledge 20 of UWB channel usage learned from Acquisition Compact frames received from other initiators as described 21 in 10.39.3.3. |

***Comment Indices in 15-25-0174-00-04ab-consolidated-comments-draft-2.0:***

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| **Name** | **Index#** | **Pg** | **Sub-Clause** | **line** | **Comment** | **Proposed Change** |
| VERSO, BILLY | 408 | 69 | 10.39.3.3 | 12 | Since the Acquisition frame "UWB Per-Session Info" field encoding allows for this field to be omitted, the statement here in not true. | Change "include" to "may include" |

**Relevant Text :**



**Disposition Detail :**

The comment is correct and I also agree with.

Based on this, the following changes are suggested.

**Disposition :** Accepted

**Proposed text changes on P802.15.4ab™/Draft 2.0 :**

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| ***Change 10.39.3.3 P69L12 as below ;***10 channel, or using both. The NB Acquisition Compact frame and UWB Acquisition Compact frame are 11 described in 10.39.11.3.17. To provide information about UWB channel usage, both the NB Acquisition 12 Compact frame and the UWB Acquisition Compact frame may include the UWB Per-Session Info Fields. The 13 higher layer determines the interval between Acquisition Compact frame transmissions. |

***Comment Indices in 15-25-0174-00-04ab-consolidated-comments-draft-2.0:***

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| **Name** | **Index#** | **Pg** | **Sub-Clause** | **line** | **Comment** | **Proposed Change** |
| MAMAN, MICKAEL | 169 | 73 | 10.39.3.6 | 16 | what is the RPA Hash of the advertising confirmation compact frame when two or more responders are selected? | add "In this case, the RPA Hash field of each Start of Ranging Compact frame shall be calculated as specified in 10.39.11.1.2.1 using the IRK of the initiator." |

**Relevant Text :**



**Disposition Detail :**

The comment is thought to be reasonable and I also agree with.

Based on this, the following changes are suggested.

**Disposition:** Accepted

**Proposed text changes on P802.15.4ab™/Draft 2.0 :**

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| ***Change 10.39.3.5 P48L42 as below ;***16 If two or more responders are selected, the initiator shall send an Advertising Confirmation Compact frame17 indicating the selected responders and the time offset between the start of the Advertising Confirmation18 Compact frame and the start of the separate Start of Ranging Compact frame that will be sent to each of the19 selected responders. In this case, the RPA Hash field of each Start of Ranging Compact frame shall be calculated as specified in 10.39.11.1.2.1 using the IRK of the initiator. If coordination is active, during the minimum of all the time offsets, the initiator may20 attempt to capture the Acquisition Compact frames transmitted by other initiators on the narrowband |

***Comment Indices in 15-25-0174-00-04ab-consolidated-comments-draft-2.0:***

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| **Name** | **Index#** | **Pg** | **Sub-Clause** | **line** | **Comment** | **Proposed Change** |
| VERSO, BILLY | 572 | 138 | 10.39.11.3.18 | 11 | My understanding is that the acquisition compact frame is used to advertise current usage,(not specifying or reqesting any particular action), so it should be talking about stuff currently in ongoing use. The language could be changed to reflect this more clearly by saying as much as possible that the field being described "indicates" xxxx "is being used". Currently "indicates" is used in some places and "specifies" in others, which is a little confusing. | language could be changed to reflect this more clearly by saying as much as possible that the field being described "indicates" xxxx "is being used". |

**Relevant Text :**





**Disposition Detail :**

The comment is correct, basically. The most important information in Acquisition Compact Frame is current resource usage situation from nearby controllers (initiators) what they are occupying now. Therefore, the language is likely to be talking about stuff in on-going use of resources.

In addition to that, the Acquisition Compact Frame also carries information about how to acquire the next Acquisition Compact frames, which will be advertised hereafter.

Therefore, efforts are made to distinguish these two aspects and the language is revised over the related sub-clauses regarding coordination.

There are TWO relevant sections mentioning Acquisition Compact Frame as follows, so changes are made focusing on these sub-clauses ;

* 10.39.11.3.17 : explaining format/fields of Acquisition Compact frame. Referred in comments.
* 10.39.3.3 : explaining coordination. Not referred in comments, but needs work, as well. (p.69)

At the same time, the sub-clause numbering looks to be revised so that it can represent appropriate hierarchy. Because now the clause “10.39.11.3.17 Acquisition Compact Frame” has no sub-clause, while it looks it should have sub-parts.

**Disposition:** Revised

**Proposed text changes on P802.15.4ab™/Draft 2.0 :**

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| ***Change 10.39.11.3.17 P138 as below ;***11 **10.39.11.3.17 Acquisition Compact frame**12 **10.39.11.3.17.1 General** 13 The Acquisition Compact frame is used for coordination. The coordination mechanism is described in detail in 10.39.3.3. The Compact Frame Content field of the 14 Acquisition Compact frame shall be formatted as shown in Figure 130.***…***16 The Address field shall be set as specified in 10.39.11.1.2.2 for Public Address. When a device is sending the 17 Acquisition Compact frame in both of the UWB channel and the NB channel, the Address field value used shall be 18 the same in both Compact frames. 19 The Message Control field value (within the Message ID field) determines the encoding and Message Content 20 Field. And it identifies the type and usage for the Acquisition Compact frame. Table 28 lists the defined values 21 of the Message Control field with a description and a clause reference to the Message Content Field encoding. 22 The Message Control field shall have one of the values listed in Table 28. ***…******Change 10.39.11.3.19 P139 as below ;***3 **10.39.11.3.17.2 Acquisition Compact frame with Message Control field value of zero** 4 When the Acquisition Compact frame has a Message Control field value (within the Message ID field) of 5 zero, it means this frame is a NB Acquisition Compact frame. The Message Content field shall be formatted as shown in Figure 131..11 The NB AP Type field when zero it means periodic coordination is being used, while when one, it meansaperiodic 12 coordination is being used. 13 The Type of UWB Per-Session Info field shall have one of the non-reserved values given in Table 29 which 14 determines the format of the elements of the UWB Per-Session Info List field.***Change 10.39.11.3.19 P140 as below ;***3 The Number of UWB Per-Session Info field is an unsigned integer that specifies the number of elements in 4 the UWB Per-Session Info List field. 5 The UWB AP Info Present field value when one indicates the UWB AP Info field exists, and when 6 zero it indicates the UWB AP Info field is not present. 7 The Next NB AP field indicates the time offset in RSTU from the start of the current NB Acquisition Compact 8 frame to the start of the next NB Acquisition Compact frame. 9 The fields of the UWB AP Info appear in a fixed order; however, not all fields are included in all frames. If 10 UWB AP Info is present, the initiator shall send the UWB Acquisition Compact frame after the NB 11 Acquisition Compact frame. When the UWB AP Info fieldis present, it shall be formatted as shown in Figure 133.….13 The Delta T field value gives the time offset in RSTU from the start of the current NB Acquisition Compact frame 14 to the start of the next UWB Acquisition Compact frame. 15 The UWB Channel field specifies the UWB channel number, from Table 16-27, on which the UWB 16 Acquisition Compact frame is to be transmitted. 17 The Preamble Code field specifies the preamble code index to be used for the UWB Acquisition Compact 18 frame transmission. This shall be a code index selected from either the length 91 ternary codes given in 19 Table 16-9 or the length 127 ternary codes given in Table 16-8. 20 Information of UWB channel being used per UWB session is given by UWB Per-Session Info List field. If 21 UWB Per-Session Info List fields are included in both NB Acquisition Compact frame and UWB Acquisition 22 Compact frame, then the order of the elements describing the sessions shall be identical in both NB 23 Acquisition Compact frame and UWB Acquisition Compact frame. 24 When the Type of UWB Per-Session Info field value is one, each element of the UWB Per-Session Info List 25 field shall be formatted as shown in Figure 134. ***Change 10.39.11.3.19 P141 as below ;***2 The Block Duration field is an unsigned integer that specifies the duration of the ranging block being used in RSTU. 3 The UWB Channel field indicates the UWB channel number being used by the UWB session. 4 The Hop Mode field specifies the hopping mode for the current UWB session, where zero means no hopping and 5 one means the hopping is in use now. 6 The Preamble Code Index field value specifies the UWB preamble code being used by the UWB session. MMS 7 UWB specific code information including the MMRS sequence number is provided by the Start of Ranging 8 Compact frame. When the UWB SHR is not used, the Preamble Code Index field can be ignored by 9 responders. 10 When the Type of UWB Per-Session Info field value is two, each element of the UWB Per-Session Info List 11 field shall be formatted as shown in Figure 135.……13 The Delta T field indicates the time offset in RSTU to the start of active period in the ranging block relative to the 14 start of the current packet. 15 The UWB Channel field indicates the UWB channel number being used by the UWB session. 16 The Preamble Code index field indicates the preamble code being used by the UWB session. 17 The Active Period Duration field indicates the time difference between the start and the end of UWB channel 18 transmission activity within a block of UWB session in RSTU. 19 When the Type of UWB Per-Session Info field value is three, each element of the UWB Per-Session Info 20 List field shall be formatted as shown in Figure 136.……22 The Delta T field indicates the time offset in RSTU to the start of the next ranging block relative to the start of the 23 current packet. 24 The UWB Channel field indicates the UWB channel number in use by the current UWB session.***Change 10.39.11.3.19 P142 as below ;***1 The Hop Mode field specifies the hopping mode for the current UWB session, where zero means no hopping and 2 one means the hopping is in use now. 3 The Preamble Code index field indicates the preamble code being used by the UWB session. 4 The Round Duration field is an unsigned integer that specifies the duration of a round in RSTU. 5 The Number of Rounds field is an unsigned integer that specifies the number of ranging rounds in the ranging 6 blocks of the UWB session. 7 The Active Rounds field contains a binary bitmap. Each bit maps to a round in the block of the UWB session. 8 A bit set to one indicates an active round and set to zero indicates an inactive round. The most significant bit 9 corresponds to the first round of the block. 10 **10.39.11.3.17.3 Acquisition Compact frame with Message Control field value of one** 11 When the Acquisition Compact frame has a Message Control field value (within the Message ID field) of 12 one, it means this frame is a UWB Acquisition Compact frame. The Message Content field shall be formatted as shown in Figure 137. ….18 The UWB AP Type field value when zero it means periodic coordination is being used, while when one it means aperiodic 19 coordination is being used. 20 The Type of UWB Per-Session Info field shall have one of the non-reserved values given in Table 29 which 21 determines the format of the UWB Per-Session Info field. 22 The Number of UWB Per-Session Info field is an unsigned integer that specifies the number of elements in 23 the UWB Per-Session Info List field. 24 The Next UWB AP field value gives the time remaining in RSTU until the start of the next UWB Acquisition 25 Compact frame. 26 Information about the UWB channel usage per UWB session is given using the UWB Per-Session Info List 27 field. If the UWB Per-Session Info List fields are included in both the NB Acquisition Compact frame and 28 the UWB Acquisition Compact frame, then ensure the order of the elements describing the sessions is 29 identical in both the NB Acquisition Compact frame and the UWB Acquisition Compact frame.***Change 10.39.11.3.20 P143 as below ;***1 When the Type of UWB Per-Session Info field value is one, each element of the UWB Per-Session Info List 2 field in use shall be formatted as shown in Figure 134. 3 When the Type of UWB Per-Session Info field value is two, each element of the UWB Per-Session Info List 4 field in use shall be formatted as shown in Figure 135. 5 When the Type of UWB Per-Session Info field value is three, each element of the UWB Per-Session Info 6 List field in use shall be formatted as shown in Figure 136.***Change 10.39.3.3 P69 as below ;***1 **10.39.3.3 Coordination** 2 The coordination mechanism may be used by the initiator to discover UWB sessions in use currently nearby and to avoid 3 collisions resulting from the overlap of blocks. Support for this coordination is optional for all devices. The 4 higher layer determines whether coordination is active or not. If coordination is active, the initiator 5 opportunistically or periodically transmits an Acquisition Compact frame (10.39.11.3.17) with information 6 about its UWB channel usage after a session is configured. The transmission of these Acquisition Compact 7 frames may start before the start of the first block. The initiator transmits these Acquisition Compact frames 8 using either the O-QPSK PHY, for NB Acquisition Compact frames, in the *aOqpsk5g8AquisitionChan* 9 channel or the HRP UWB PHY, for UWB Acquisition Compact frames, in the *aHrpUwbAquisitionChan*10 channel, or using both. The NB Acquisition Compact frame and UWB Acquisition Compact frame are 11 described in 10.39.11.3.17. To provide information about UWB channel usage, both the NB Acquisition 12 Compact frame and the UWB Acquisition Compact frame include the UWB Per-Session Info Fields. The 13 higher layer determines the interval between Acquisition Compact frame transmissions. 14 If coordination is active, before starting a new session, the initiator scans for Acquisition Compact frame on 15 the *aOqpsk5g8AquisitionChan* channel and/or the *aHrpUwbAquisitionChan* channel. The length of the 16 scanning period is implementation dependent. The initiator thus obtains information about the UWB channel 17 usage from other initiators, and with this knowledge, the initiator may select values for configuring its new 18 session to minimize the overlap with active periods of other sessions nearby. The details of this are 19 implementation specific.20 Otherwise, the initiator starts the control phase without scanning for Acquisition Compact frame. …..23 The Figure 30 shows an example of session initialization when the Acquisition Compact frame helps 24 coordination. Initiator 1 is a UWB controller that wants to range with Responder 1. Initiator X is another 25 UWB controller nearby that doesn’t have any relationship with Initiator 1 or Responder 1. Initiator X sends 26 an Acquisition Compact frame with its anticipated UWB channel usage information for other nearby 27 controller devices to receive. Any nearby controller that receives the Acquisition Compact frame can learn 28 how the UWB channel resources around it are used, and based on this, arrange its own session to avoid 29 interfering with them. 30 In this example Initiator X sends the first Acquisition Compact frame so to announce its UWB channel 31 resource usage information, but this is not received by Initiator 1 since it is not in receiving mode. After the 32 time specified by the Next NB AP field, another Acquisition Compact frame is sent from Initiator X and ***Change 10.39.3.3 P70 as below ;***1 successfully received by Initiator 1 since this transmission coincides with its receiving (scan) period. The 2 Delta T field of the Acquisition Compact frame indicates the time offset in RSTU to the start of the next ranging 3 block relative to the start of the current Acquisition Compact frame. Since the Acquisition Compact frame 4 indicates how Initiator X intends to use the UWB channel, Initiator 1 can delay using the UWB channel to 5 avoid conflict.6 Once Initiator 1 knows that Initiator X has finished using the UWB channel, it sends its Advertising Poll 7 Compact frame to trigger the transaction with Responder 1. 8 Figure 31 is the message sequence chart corresponding to the Figure 30 example. 9 The Initiator X sends Acquisition Compact frames to announce its UWB channel usage. These can be 10 periodic or aperiodic. In this example the second Acquisition Compact frame transmission is successfully 11 received by Initiator 1 which has turned on its receiver to scan for Acquisition Compact frames. Then after 12 Delta T passes, Initiator X performs its MMS UWB ranging, while during this period Initiator 1 avoids using 13 the UWB channel resources.14 After the MMS UWB ranging between Initiator X and Responder X has completed, Initiator 1 completes its 15 session initialization with Responder 1 and begins ranging. |