IEEE P802.15  
Wireless Personal Area Networks

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| CID xxx | | | | |
| Date: Sept 6, 2024 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Jinjing Jiang | Apple Inc. |  |  | jinjing @ apple.com |
| Alex Krebs | Apple Inc. |  |  | a\_krebs @ apple.com |
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Abstract

This document discusses and proposes resolutions for the following CIDs: 46, 69, 71, 72, 129, 130, 131, 132, 166, 167, 189, 190, 461, 462, 580, 581, 594, 595, 598, 599, 603, 872,913, 919, 1014, 1015, 1180, 1223, 1224, 1230, 1231, 1367, 1368, 1369, 1370, 1371, 1390, 1391, 1405, 1406, 1446.

The discussion and proposed changes are based on P802.15.4ab™ D01 Draft Standard for Low-Rate Wireless Networks.

Revision history:

R0 – Initial version

R1 – Remove CID 277

R2 – minor updates

R3 – editorial updates on the resolutions including adding CID 189 in the abstract list; remove CIDs 584, 590, 593; revise CIDs 46, 872, 1405.

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 46 | 73 | 15 | RpDuration shall be fixed for one-to-many MMS in order to avoid a shift of the subround | add, In One-to-Many MMS Ranging, the RpDuration field shall be keept for the whole ranging round and the number of UWB MMS fragment transmissions of the ranging subrounds shall be adjusted. | Revised. |

## CIDs 46

Add the following text at the end of Line 15 on Page 73.

*In One-to-Many MMS Ranging, the RpDuration field shall be kept for the whole ranging round and the number of UWB MMS fragment transmissions of the ranging sub-rounds shall be adjusted not to surpass the corresponding RpDuration.*

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 69 | 107 | 1 | in Figure 97, how to define the presence of start slot index and end slot index fields? | in Figure 97, how to define the presence of start slot index and end slot index fields? | Rejected. |

## CIDs 69

It is controlled by the “Extended Presence Bitmap Present” field in the Presence Bitmap field.

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 71 | 109 | 5 | in Figure 102, the size of NB channel map is 0/2/5/6 | as in comment | Accepted. |
| 72 | 110 | 11 | in Figure 105, the size of NB channel map is 0/2/5/6 | as in comment | Accepted. |
| 129 | 106 | 1 | NB channel Map field is 6 octets long, either the field here should be renamed to a different name or the 6-octet bitmap should be called something else (e.g., Full NB Channel Map). | As in comment | Revised. |
| 130 | 106 | 5 | Only the 6 octet version the NB channel Map field (10.38.9.3.7) is referenced. | Add the other versions of the NB channel Map field. | Accepted. |
| 132 | 109 | 5 | Is the NB channel Map field limited to 6 octets here? | Add the other versions of the NB channel Map field. | Accepted. |
| 598 | 109 | 5 | The NB Channel Map has only lengths of 0 and 6, but there is no restriction for lengths of 2 or 5. | Either change 0/6 to 0/2/5/6 or explain why 2 and 5 octet versions are not allowed. | Accepted. |
| 598 | 109 | 5 | The NB Channel Map has only lengths of 0 and 6, but there is no restriction for lengths of 2 or 5. | Either change 0/6 to 0/2/5/6 or explain why 2 and 5 octet versions are not allowed. | Accepted. |
| |  | | --- | | 603 | | 111 | 10 | The NB Channel Map has only lengths of 0 and 6, but there is no restriction for lengths of 2 or 5. | Either change 0/6 to 0/2/5/6 or explain why 2 and 5 octet versions are not allowed. | Accepted. |
| 1367 | 106 | 5 | This could be lower and upper NB channel maps as well | Change to "per 10.38.9.3.7, 10.38.9.3.8 and 10.38.9.3.9" | Accepted. |
| 1368 | 107 | 5 | This could be lower and upper NB channel maps as well | Change to "per 10.38.9.3.7, 10.38.9.3.8 and 10.38.9.3.9" | Accepted. |
| 1369 | 109 | 5 | In Figure 102, change "NB Channel Map" field length to 0/2/5/6. | As in the comment | Accepted. |
| 1370 | 109 | 11 | This could be lower and upper NB channel maps as well | Change to "per 10.38.9.3.7, 10.38.9.3.8 and 10.38.9.3.9" | Accepted. |
| 1371 | 110 | 10 | In Figure 105, change "NB Channel Map" field length to 0/2/5/6. | As in the comment | Accepted. |

## CIDs 71, 72, 129, 130, 132, 598, 603, 1367, 1368, 1369, 1370, 1371

The NB Channel Map is controlled by the Presence Bitmap’s 2-bit on which type of the NB Channel Map (6, low, high). Indeed, there are four options as used in other places in the spec.

Adopt the proposed change on Figure 102, 105.

Replace “10.38.9.3.7 The NB Channel Map field” to “10.38.9.3.7 The NB Full Channel Map field” and replace the references in the whole document.

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 131 | 106 | 19 | It is better to list the present fields that may be non-zero to avoid having to change the sentence if any new presence bit is added to the presence bitmap. | change as: "…, except that the fields other than the NB Channel Map Present field, the Management PHY Configuration Present field, the Management MAC Configuration Present field, the Ranging PHY Configuration Present field, the Ranging MAC Configuration Present field, the Start and End Slot Indices Present field, Block and Round Index Present field, and the Extended Presence Bitmap Present field shall all be set to zero." | Accepted. |

## CIDs 131

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 166 | 109 | 4 | The number of Octets occupied by Zero Padding should be 0/1/2/3 instead of 0/1/2/3/4 | As in the comment | Accepted. |

## CIDs 166

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 167 | 111 | 21 | The description of the Round-trip Time One field and Round-trip Time Two field is not consist with that of the Round-trip time field in Line 13 | Adjust the description of the Round-trip Time One field and Round-trip Time Two field as the Round-trip Time field | Revised. |

## CIDs 167

Revise the following text in Section 10.38.9.15.

The Round-trip Time One field is an unsigned integer that reports the time difference, measured at the initiator, between the RMARKERs of the initiator’s MMS fragments and the responder’s MMS fragments with Time Shift Indication field (defined in 10.38.9.12) set to zero. The units of time are as specified in 10.29.1.4 (Ranging counter time unit).

The Round-trip Time Two field is an unsigned integer that reports the time difference, measured at the initiator, between the RMARKERs of the initiator’s MMS fragments and the responder’s MMS fragments with Time Shift Indication field (defined in 10.38.9.12) set to one that completes the round-trip time measurement. The units of time are specified in 10.29.1.4.

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 189 | 73 | 26 | For the One-to-many Poll Compact frame with a Message Control field value of 0x50, if the two or more responders select the same sub-round and receiving the same one-to-many compact frame in the selected sub-round, how the responder knows it has been chosen by the initiator to proceed to the following ranging phase? There is no field in the One-to-many Poll Compact frame with a Message Control field value of 0x50 to inform the selected responder. | need to clarify the use case of the One-to-many Poll Compact frame with a Message Control field value of 0x50, or this kind of poll compact frame should be deleted. | Rejected. |

## CIDs 189

Reject Reason: At the beginning of Section 10.38.8.2, it describes how the responder randomly selects a sub-round to participate the contention-based ranging. If two or more responders select the same sub-round, a collision happens, and the sub-round fails in general. The proposed change in the comment does not contain sufficient detail.

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 190 | 73 | 6 | For the basic one to many ranging One-to-many Poll Compact frame within the first sub-round, is there only one One-to-many Poll Compact frame and one One-to-many Response Compact frame can be exchanged according to the description? | It is better to follow the same mechanism as which in one to one ranging control phase for all sub-rounds in basic one to many ranging control phase. The number of One-to-many Poll Compact frames and the number of One-to-many Response Compact frames can be configured in the Management MAC Configuration field. | Rejected. |

## CIDs 190

The proposed change in the comment does not reflect the functionality of “The Management MAC Configuration field” in current specification text, which configures the duration of the phases, rather than the number of frames exchanged during each phase.

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 461 | 73 | 11 | The initiator first sends One-to-many poll, but what is the second POLL it sends? Is that also one-to-many? | Specify which poll message is used for 2nd responder. | Revised. |
| 1406 | 73 | 4 | The definition of O2M basic operation is explicit in what Poll what is to be used in round1, but ambigious in what Response and Report frames are to be used. | Change Figure 40 and the section to explicitly name the compact frames to be used for Reponse and Report frames (I assume the one-to-many frames in 10.38.9.13, 10.38.9.14, and 10.38.9.15 are meant?) | Revised. |

## CIDs 461, 1406

Yes, it is one-to-many Poll. This has been described in one-to-many Poll Compact Frame definition too.

Add the following text at the end of Line 10 of Section 10.38.8.1.

During the Control Phase of each sub-rounds of the one-to-many MMS ranging, One-to-many Poll Compact frame, One-to-many Response Compact frame and One-to-many Report Compact frame are used.

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 462 | 73 | 15 | Unknown acronym CFO, and SFO. | Those acronyms are used in few places but are not expanded and are not added to acronyms. Either expand them here or add them to acronyms. | Resolved in CID 469. |

## CIDs 462

Resolved in CID 469.

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 580 | 103 | 8 | What is the point of including extra octets of zero when the frames are supposed to be compact. | Remove extra unneeded data. | Rejected. |
| 595 | 108 | 25 | What is the point of including extra octets of zero when the frames are supposed to be compact. | Remove extra unneeded data. | Rejected. |
| 599 | 109 | 16 | What is the point of including padding when the frames are supposed to be compact. | Remove extra padding or add text explaining why the padding is required. | Rejected. |

## CIDs 580, 595, 599

These padding octets are necessary for acceptable RX performance.

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 581 | 103 | 21 | I assume the addresses are calculated using responders IRK and the initiators prand. | Add text who the addresses are generated. | Revised. |

## CIDs 581

Yes, the understanding is correct.

Add the following text at the end of Line 21 on Page 103.

The address of the selected responder is calculated using the responder’s IRK and the initiators RPA\_prand.



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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 872 | 74 | 6 | In the contention base one-to-many the POLL and Response order is reversed in some instances. However many messages require the POLL, RESPONSE order, eg. when exchanging short term parameters. | Describe the behaviour of messaging when the POLL, RESPONSE order is reversed. | Revised. |

## CIDs 872

During contention-based ranging, the initiator does not know whether or which Responder will respond in each sub-round, the parameters shall be fixed. Therefore, no short-term parameters shall be exchanged between the Initiator and Responders.

Add the following text at the end of Line 28 on Page 73:

Short-term parameters shall not be exchanged between the initiator and the responders.

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 913 | 110 | #13,#14,#15 | Original text is :"*The* ***Reply Time*** *field value is an unsigned integer reporting the time difference, measured at the responder, between the RMARKERs of the MMS fragments received from the initiator and the MMS fragments transmitted by the responder.*  "  It should be clarified how to obtain the value of the ***Reply Time*** parameter in the UWB MMS ranging phase with multiple RSFs and/or RIFs (as shown in the example in Figure 36), as the value of the ***Reply Time*** parameter can be the cumulative or mean value of multiple RSFs and/or RIFs. | "The Reply Time field value is an unsigned integer reporting the time difference, measured at the responder, between the RMARKERs of the MMS fragments received from the initiator and the MMS fragments transmitted by the responder. For the multiple RSFs and/or RIFs of the UWB MMS ranging phase,the value of the Reply Time should be the mean value of several Reply Time parameters measured at the responder. " | Rejected. |

## CIDs 913

Rejection reason: The method to measure the Reply Time is implementation dependent.

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 919 | 111 | #13,#14,#15 | Original text is :"*The* ***Round-trip Time*** *field value is an unsigned integer that reports the time difference, measured at the initiator, between the RMARKERs of the initiator's MMS fragments and the responder's MMS fragments* "  It should be clarified how to obtain the value of the ***Round-trip Time*** parameter in the UWB MMS ranging phase with multiple RSFs and/or RIFs (as shown in the example in Figure 36), as the value of the ***Round-trip Time*** parameter can be the cumulative or mean value of multiple RSFs and/or RIFs. | "The Round-trip Time field value is an unsigned integer that reports the time difference, measured at the initiator, between the RMARKERs of the initiator's MMS fragments and the responder's MMS fragments For the multiple RSFs and/or RIFs of the UWB MMS ranging phase,the value of the Round-trip Time should be the mean value of several Round-trip Time parameters measured at the responder. " | Rejected. |

## CIDs 919

Rejection Reason: The method to measure the Round-trip time is implementation dependent.

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 1014 | 102 | 16 | This frame keeps getting longer after every draft. Let's limit the duration to 1ms. Add text that says so. | As in comment | Rejected. |
| 1015 | 108 | 17 | This frame keeps getting longer after every draft. Let's limit the duration to 1ms. Add text that says so. | As in comment | Rejected. |

## CIDs 1014, 1015

Rejection Reason: In technical standards, the frame duration shall not be limited beyond what is allowed by regulatory.

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 1180 | 73 | 20 | "These variations are accomplished using the configuration parameters." Is not a technical/true statement.. | change to "Initialisation phase and control phase messages allow for these variations to be signalled and coordinated. | Revised. |

## CIDs 1180

Delete the sentence “These variations are accomplished using the configuration parameters.” at the end of Section 10.38.8.1.

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 1223 | 103 | 9 | "not the first one" is ambiguous. | Change to say "for second and subsequent ranging sub-rounds in each ranging round" | Accepted. |

## CIDs 1223

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 1224 | 103 | 14 | In One-to-many Poll Compact frame, with its different formats, I see multiple different ways of doing the same thing, e.g. number of responders and slots per responder, is same/similar to number of responders with individual start and end index specifications. I understand this gives lots of flexibility, but it also add complexity in implementations having to code and test all the variations, or choose which to implement which leads to incompatibilities where different choices are made by different vendors. Can TG4ab not converge as a group on a single message format that gives the most sensible set of controls and delete the rest. | Rationalize the options here to have a single message format. | Rejected. |

## CIDs 1224

Rejection Reason: Options are preferred due to different usage scenarios. It is a common practice to use fields such as Message Control to indicate different configurations.

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 1230 | 105 | 1 | The Size of Sub-Rounds field does not indicate the units, also would be better renamed to "Sub-round Size". | Change to say "The Sub-round Size field indicates the size of the ranging sub-round in units of ranging slots.", and rename the field in Figure 93 to "Sub-round Size". | Accepted. |

## CIDs 1230

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 1231 | 105 | 1 | units are not specified here. Is it in "ranging slots"? | Add the unit into the line, change "size" to "size in ranging slot units" | Accepted. |

## CIDs 1231

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 1390 | 73 | 16,17 | Clarify what the meaning of "reserve" is. Also this language turns the previously optional report phase into a conditionally mandatory report phase at the end of the ranging round. | Replace lines 16-17 with:  Ranging slots for measurement report phases may be allocated at the end of each sub-round for each responder individually, and/or cumulatively grouped for multiple responders at the end of the ranging round. | Accepted. |

## CIDs 1390

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 1391 | 73 | 20 | One to many ranging does use MessageControl to indicate report directions instead of configuration parameters. | Replace "These variations..." with  "These variations are accomplished via message control signaling as described in 10.38.9.12" | Revised. |

## CIDs 1391

The line is deleted in CID 1180 to remove confusion.

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 1405 | 73 | 4 | The introduction of "sub-rounds" is superfluous. | Use the established definitions of block-based MAC ranging with "ranging rounds" instead of "sub-rounds", and "ranging block" instead of "ranging round" for all O2M definitions in this and all following subsections (basic O2M, time-efficient O2M, multiple RSF) | Revised. Add sub-round definition as the following. |

## CIDs 1405

Change the first paragraph of 10.38.8.1 as the following.

In one-to-many MMS ranging, the basic operation is illustrated by Figure 40. The ranging exchange is started by the initiator broadcasting a One-to-many Poll Compact frame, which includes the configuration parameters for the one-to-many ranging round. These configuration parameters list the responders, determine how the initiator ranges with these responders, divides the ranging rounds into multiple sub-rounds where a sub-round is a period of sufficient duration to complete one range-measurement cycle between the initiator and a single responder participating in the one-to-many ranging, and specifies how the initiator completes the ranging phases with each responder during each sub-round. The One-to-many Poll Compact frame, is described in 10.38.9.12.

Change the label “Ranging round” in Figure 40 to “One-to-many ranging round”.

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| **CID** | **Page** | **Line** | **Comment** | **Proposed Change** | **Proposed resolution** |
| 1446 | 111 | 8 | replace 'Message Control field' by 'Message Content field'. | make change. | Accepted. |

## CIDs 1446