**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **LB213/D02 comment resolution -- various CIDs -- p.111 to p.201** |
| Date Submitted | July 28, 2025 |
| Sources | Alex Krebs (Apple)  krebs @ apple.com |
| Re: |  |
| Abstract |  |
| Purpose | To propose resolution for MMS related comments for “P802.15.4ab™/D02 Draft Standard for Low-Rate Wireless Networks”. |
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# CID 536

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| **Name** | **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| VERSO, BILLY | 536 | 111 | 10.39.11.3.1 | 14 | This statement is an optimisation of what can be sginalled in SMV TLVs. Question: Should we have similar optimisations/statements for other frame transmissions, in similar terms of expected support. | Consider whether this is a good thing to do and add the appropriate statements as needed, for one to many and other flavours of message or field inclusions. |

Discussion: Note that we added below text as per resolution of CID 452, so we can extend on this. Tbd. if we want to reassign completion of this comment regarding "other flavours" to other participants?

Proposed resolution: Revised.

Disposition detail:

Instruction to editor: Change clause 10.39.3.9 as per below:

**10.39.3.9 Supported message control list indication**

The initiator (controller) may indicate the supported message ID field values for each Compact frame by

referencing the supported Compact Frame ID values and their Message Control and Message Version values

using the SMID TLVs field. Subclause 10.39.11.1.3.2 details the message encodings.

For example, a SMID\_TLVs to indicate support for basic one-to-one ranging with extended support for

Presence Bitmap signaling in Poll and Response frames with Message Control equal to 1 is represented by the following SMID\_TLVs field:

{ 0x00, 0x01, 0x00, //SMC\_Tag=0 (Advertising Poll), SMC Length=1, SMC\_Values=0

0x01, 0x01, 0x00, //SMC\_Tag=1 (Advertising Response), SMC Length=1, SMC\_Values=0

0x02, 0x01, 0x00, //SMC\_Tag=2 (Start of Ranging), SMC Length=1, SMC\_Values=0

0x03, 0x02, 0x00, 0x10, //SMC\_Tag=3 (One-to-one Poll), SMC Length=2, SMC\_Values={0x00, 0x10}

0x04, 0x02, 0x00, 0x10, //SMC\_Tag=4 (One-to-one Response), SMC Length=2, SMC\_Values={0x00, 0x10}

0x05, 0x01, 0x00, //SMC\_Tag=5 (One-to-one Initiator Report), SMC Length=1, SMC\_Values=0

0x06, 0x01, 0x00 } //SMC\_Tag=6 (One-to-one Responder Report), SMC Length=1, SMC\_Values=0

An alternative, more concise representation using the Message Control 0 set defined in 10.39.11.3.1 is:

{ 0x00, 0x01, 0x00, //SMC\_Tag=0 (Advertising Poll), SMC Length=1, SMC\_Values=0

0x03, 0x01, 0x10, //SMC\_Tag=3 (One-to-one Poll), SMC Length=2, SMC\_Values={0x00, 0x10}

0x04, 0x01, 0x10 } //SMC\_Tag=4 (One-to-one Response), SMC Length=2, SMC\_Values={0x00, 0x10}

The responder (controlee) may request ranging session configuration in the Advertising Response Compact

frame and may indicate the supported message ID list for each Compact frame by referencing the

supported Compact Frame ID field values and their Message ID field values using the SMID TLVs field.

After the supported message control lists have been exchanged, devices shall use values for Compact Frame

ID and Message ID indicated in the peer's SMID TLVs field when transmitting Compact frames to the

peer.

# CID 545

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| **Name** | **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| VERSO, BILLY | 545 | 114 | 10.39.11.3.3 | 13 | I think we could say here that this as an RPA HASH, rather than above on line 2. (And do the same on line 25 too). | On lines 13 and 24, change the phrase "identifies the address of a responder" to "is an RPA Hash field value generated using the RPA Prand field value from the initiator's Advertising Poll Compact frame and the IRK of the responder". And remove the sentence from line 2. |

Discussion: Accepted to be confirmed with Youngwan et al.

A close-up of a document

Description automatically generated

Proposed resolution: Accepted.

Disposition detail: n/a.

# CID 192

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| **Name** | **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| MAMAN, MICKAEL | 192 | 115 | 10.39.11.3.4 | 10 | missing value "one" for Message Control field of start of ranging compact frame | add "one" |

Discussion: Yes, "one" is apparently missing in this line.

Proposed resolution: Accepted.

Disposition detail: n/a

# CID 547

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| **Name** | **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| VERSO, BILLY | 547 | 115 | 10.39.11.3.3 | 7 | In the MCPS-DATA.request, the NHL provides the IRK of the receiving device via the DstAddr and/or the IRK of the transmitting device in the SourceIrk paramete, so it is the NHL that is making this choice depending on which it provides? The wording here does not reflect how the primitive is used | Reword to say something like: RPA Hash field shall be calculated as specified using the IRK supplied in the MCPS-DATA.request. For a single responder the DstAddr parameter provides responders IRK, otherwise the initiator's IRK provided by the SourceIrk parameter is used. |

Discussion: That's a good suggestion to make the behaviour more comprehensive.

Proposed resolution: Revised.

Disposition detail: Instruction to editor: Change clause as follows:

When the Start of Ranging Compact frame is transmitted to a single responder selected during contention-

based initialization and setup (as described in 10.39.3.6), the RPA Hash field shall be calculated as specified

in 10.39.11.1.2.1 using the responder's IRK supplied in the MCPS-DATA.request provided the DstAddr parameter. Otherwise, the RPA Hash field shall be calculated as specified

in 10.39.11.1.2.1 using the IRK of the initiator provided by the SourceIrk parameter.

# CID 553

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| **Name** | **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| VERSO, BILLY | 553 | 118 | 10.39.11.3.5 | 15 | In the MCPS-DATA.request, the NHL provides the IRK of the receiving device via the DstAddr and/or the IRK of the transmitting device in the SourceIrk paramete, so it is the NHL that is making this choice depending on which it provides? The wording here does not reflect this. | Reword to say something like: RPA Hash field shall be calculated as specified using the IRK supplied in the MCPS-DATA.request. For a single responder the DstAddr parameter provides responders IRK, otherwise the initiator's IRK provided by the SourceIrk parameter is used. And... Similarly review/revise similar statements on RPA Hash and IRKs for all compact frame descriptions where similar statements are made. |

Discussion: Good idea to make it more comprehensive.

Proposed resolution: Revised.

Disposition detail:

When the One-to-one Poll Compact frame is transmitted to a single responder selected during contention-

based initialization and setup (as described in 10.39.3.6), the RPA Hash field shall be calculated as specified

in 10.39.11.1.2.1 using the responder's IRK supplied in the MCPS-DATA.request provided in the DstAddr parameter. Otherwise, the RPA Hash field shall be calculated as specified

in 10.39.11.1.2.1 using the IRK of the initiator provided by the SourceIrk parameter.

# CID 556

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| **Name** | **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| VERSO, BILLY | 556 | 120 | 10.39.11.3.6 | 26 | I guess this means in the MCPS-DATA.request, DstAddr mode is NONE and the SrcAddMode is COMPACT so tyhat the device sused the SourceIrk parameter | Say something about this IRK being supplied by the SourceIrk parameter in the MCPS-DATA.request. Similarly review/revise similar statements on RPA Hash and IRK for all compact frame descriptions where similar statements are made. |

Discussion: Good idea.

Proposed resolution: Revised.

Disposition detail: Instruction to editor: Change clause on p.120 l.26 as follows:

The Responder RPA Hash field shall be calculated as specified in 10.39.11.1.2.1 using the IRK of the

responder supplied in the MCPS-DATA.request provided by the SourceIrk parameter.

Instruction to editor: Change clause on p.122 l.5 as follows:

The Initiator RPA Hash field shall be calculated as specified in 10.39.11.1.2.1 using the initiator's IRK

supplied in the MCPS-DATA.request provided by the SourceIrk parameter.

Instruction to editor: Change clause on p.123 l.6 as follows:

The Responder RPA Hash field shall be calculated as specified in 10.39.11.1.2.1 using the responder's IRK supplied in the MCPS-DATA.request provided by the SourceIrk parameter.

Instruction to editor: Change clause on p.124 l.30 as follows:

The Initiator RPA Hash shall be calculated as specified in 10.39.11.1.2.1 using the initiator's IRK supplied in the MCPS-DATA.request provided by the SourceIrk parameter.

Instruction to editor: Change clause on p.131 l.1 as follows:

The Responder RPA Hash field shall be calculated as specified in 10.39.11.1.2.1 using the responder's IRK supplied in the MCPS-DATA.request provided by the SourceIrk parameter.

Instruction to editor: Change clause on p.132 l.10 as follows:

The Responder RPA Hash field shall be calculated as specified in 10.39.11.1.2.1 using the responder's IRK supplied in the MCPS-DATA.request provided by the SourceIrk parameter.

Instruction to editor: Change clause on p.133 l.27 as follows:

The Responder RPA Hash field shall be calculated as specified in 10.39.11.1.2.1 using the responder's IRK supplied in the MCPS-DATA.request provided by the DstAddr parameter.

# CID 272, 273, 274, 275

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| **Name** | **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| QIAN, BIN | 272 | 118 | 10.39.11.3.5 | 26 | The reason for having all-zero Message Content may not be clear to readers not involved in the standard development | Change the sentence to "When the Message Control field value is zero the Message Content field shall consist of two octets with the value of zero as shown in Figure 87 to assist CFO estimation" |
| QIAN, BIN | 273 | 120 | 10.39.11.3.6 | 30 | The reason for having all-zero Message Content may not be clear to readers not involved in the standard development | Change the sentence to "When the Message Control field value is zero the Message Content field shall consist of five octets with the value of zero as shown in Figure 91 to assist CFO estimation" |
| QIAN, BIN | 274 | 125 | 10.39.11.3.9 | 8 | The reason for having all-zero Message Content may not be clear to readers not involved in the standard development | Change the sentence to "When the Message Control field value (within the Message ID field) is zero the Message Content field shall be formatted as shown in Figure 101 to assist CFO estimation" |
| QIAN, BIN | 275 | 130 | 10.39.11.3.10 | 4 | The reason for having all-zero Message Content may not be clear to readers not involved in the standard development | Change the sentence to "When the Message Control field value is zero, the Message Content field shall be formatted as shown in Figure 113 to assist CFO estimation" |

Discussion: Adding "to assist CFO estimation" makes it more comprehensible.

Proposed resolution: Accepted.

Disposition detail: n/a

# CID 555

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| **Name** | **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| VERSO, BILLY | 555 | 120 | 10.39.11.3.5 | 17 | "Either the NB Channel Map field or the NB Channel field may be present, but not both. "... Given that they are mutually exclusive. We can save having the NB Channel Present bit in the presence bitmap and reuse the NB Channel Map Present field to also signal presence of the NB Channel field. (I have already identified a need for another presence bit, see my comment on p121-L12 | Rationalise to a single bit, to indicate that channel specification info is present in the message. Which type then being determined by the value of the Long-Term Parameters Update field. |

Discussion: Pooria and Rojan are more knowledgeable about this eventually.

Proposed resolution: Reassign to tbd.

Disposition detail: n/a

# CID 558

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| **Name** | **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| VERSO, BILLY | 558 | 121 | 10.39.11.3.6 | 5 | The format Figure 92,can could cover all the cases with a single format definition, i.e., set the presence octet to all 0 and allow 4 padding octets, and give exactly same content as Figure 91. Even if there is good reason for having as sepcial frame for the figure 91 case. We could still allow the more general encodeing to also have that same ability by deleting the paragraph on line 20, and allowing for up to 4 padding bytes. | Consider reducing to a single format, or, allowing for the Figure 91 format to also reduce to a five 0x00 octets when the other fields are not needed. |

Discussion: Message Control 0 was introduced to form a basic O2O ranging set of messages, without the need for more elaborate MAC data/length/bitmap processing. Let's keep it as such.

Proposed resolution: Rejected.

Disposition detail: Simplicity preferred.

# CID 32, 33

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| **Name** | **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| CHITRAKAR, ROJAN | 32 | 122 | 10.39.11.3.7 | 12 | What happens if the Initiator encounters some error during timing measurements? How does it indicate the error condition? The comment is also applicable for other variants of the Report frame. | Use an impossible value (e.g., 0) of the Round-trip Time to indicate an error in the measurement. |
| CHITRAKAR, ROJAN | 33 | 122 | 10.39.11.3.7 | 24 | What happens if the Initiator encounters some error during timing measurements? How does it indicate the error condition? The comment is also applicable for other variants of the Report frame. | Use an impossible value (e.g., 0) of the Reply Time to indicate an error in the measurement. |

Discussion: We can reserve the upper 16 integer values for error codes. Let's make this a generic solution instead of changing all messages seperately. Tbd.: more errors than shown below.

Proposed resolution: Revised.

Disposition detail: Instruction to editor: Add clause "Ranging error codes" somewhere, e.g., under 10.39.11.3.18 "General" as follows:

**10.39.11.3.18.X Ranging Error Codes**

The following values are reserved for signaling ranging errors via the Reply Time and Round-trip time fields in described in 10.39.11.3:

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| **Value** | **Description** |
| 0xffffffffff | Generic ranging error. |
| 0xfffffffff0- 0xfffffffffe | reserved |

**Table XX -- Ranging Error Codes**

# CID 626

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| **Name** | **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| VERSO, BILLY | 626 | 201 | 11.1.3.15 | 14 | Just wondering about the pre-existing O-QPSK PHY channel numbering in the base standard. I assume there is also a channel 1, 2, 3 there also. Since we are amending it, we should be clear that any O-QPSK PHY channel we mention is not confused with the original O-QSPK channels, and if so add some qualifier. | Review the rest of the 4ab text (and base standard text?) and decide if this is an issue or not, and if it is make sure to add band modifiers 5800 MHz and 6200 MHz (and the bands of the base standard in the base standard?) as appropriate to make it unambiguous.. |

Discussion: In the base standard, channel numbering starts per band at k=0, always. Section **10.39.8.2 Channel bands** in this amendment says " the 250 channels defined in 11.1.3.15". Therefore I think it's sufficiently defined.

Proposed resolution: Rejected.

Disposition detail: n/a

# CID 4

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| **Name** | **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| Aldana, Carlos | 4 | 145 | 10.39.12 | 1 | macmmsnbinitchannel should be consistent with CAD document 15-23-452-11 that states "Periodic NB packet transmissions on fixed channels such as background advertising and control traffic are allocated in 4ab in newly allocated spectrum outside of the channel map used by 802.11 WLAN such that no interference is cast " | Change the range from "0 to 249" to a range that is consistent with the statement |

Discussion: Makes sense to change the default value for generic traffic to exclude the lower band edge channels for advertising packets.

Proposed resolution: Revised

Disposition detail: Instruction to editor: Change Default range to: "Channels 4 to 249".

# CID 7

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| **Name** | **Index #** | **Page** | **Sub-clause** | **Line #** | **Comment** | **Proposed Change** |
| Aldana, Carlos | 7 | 201 | 11.1.1 | 10 | I've heard the response "more channels is better" when discussing NB channel maps. The spectrum from 5850-5875 is available in Europe. | Change Table 11-1 and equations in lines 17 and 18 to reflect this. |

Discussion: UNII-4 is not available for narrowband, or has indoor restrictions in most regulatory domains globally, including the US and Canada.

Proposed resolution: Rejected.

Disposition detail: Regulatory constraints.