**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) |
| Title | **Updates of AP Format**  |
| Date Submitted | September 2023 |
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| Re: |   |
| Abstract |  |
| Purpose | To propose simple changes to “P802.15.4ab™/D (pre-ballot) B Draft Standard for Low-Rate Wireless Networks” to make the text inclusive of UWB-only MMS.  |
| 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. |

***Comment Line #91 and 92 in 15-23-0475-05-04ab-cc-consolidated-comments***

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***Update 10.35.9.20, 10.35.9.21, and 10.35.9.22 with followings***

**10.35.9.20 AP**

This is the AP message used by the initiator for coordination. The AP message shall be formatted as shown in Fig. x1.

|  |  |  |
| --- | --- | --- |
| **Octets: 3** | **1** | **Variable** |
| Address | MessageControl | MessageContent |

**Figure x1—AP Compact Message**

The Address field shall be set as specified in 10.35.8.2.2 for Public Address.

When the Message Control field value is zero the Message Content field shall be formatted as shown in Figure x2. The Message Control field value shall be zero for NB AP.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Bit :****3** | **5** | **3** | **4** | **1** | **Octets :****0/2** | **0/4** | **Variable** |
| NB AP Type | Reserved | Type of UWB Per-Session Info | Number of UWB Per-Session Info | UWB AP Present | Next NB AP |  UWB AP Info | UWB Per-Session Info(s) |
| Common Info | UWB Session Info |

**Figure x2 —Message Content field in AP when message control is zero.**

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

The NB AP Type field specifies whether the transmission of NB AP is periodic or aperiodic. The NB AP Type field shall have one of the values specified in Table x1.

**Table x1 – Values of the NB AP Type field**

|  |  |
| --- | --- |
| **The NB AP Type field value** | **Meaning** |
| 0 | Periodic coordination |
| 1 | Aperiodic coordination |
| 2-7 | Reserved |

The Type of UWB Per-Session Info field specifies the format of UWB Per-Session Info field to be used. The Type of UWB Per-Session Info field shall have one of the values specified in Table x2.

|  |  |
| --- | --- |
| Type of UWB Per-Session Info field value | Meaning |
| 0 | UWB Per-Session Info Field is not present  |
| 1 | UWB Per-Session Info #1, as per specified in Figure x3 |
| 2 | UWB Per-Session Info #2, as per specified in Figure x4 |
| 3 | UWB Per-Session Info #3, as per specified in Figure x5 |
| 4-7 | Reserved |

 **Table x2 – Values of the Type of UWB Per-Session Info field**

The Number of UWB Per-Session Info field is an unsigned integer that specifies the number of UWB Per-Session Info field(s).

The UWB AP Present field when one indicates the presence of UWB AP Info field if the NB AP Type field is zero or one. The UWB AP Present field when zero indicates that UWB AP Info field is not present field if the NB AP Type field is zero or one.

The Next NB AP field indicates the time remaining in RSTU until the start of the next NB AP. It is not present when the value of NB AP Type field is 0.

The fields of the UWB AP Info appear in a fixed order; however, some fields may not be included in all frames. If UWB AP Info is presented, the initiator shall send UWB AP after NB AP. Otherwise, the initiator shall not send UWB AP. When UWB AP Info is presented, the UWB AP field shall be formatted as shown in Table x3.

**Table x3 – Values of the Type of UWB Per-Session Info field**

|  |  |  |  |
| --- | --- | --- | --- |
| **Bits : 16** | **5** | **3** | **8** |
| Delta T | UWB Channel | Reserved | Preamble Code |

The Delta T field indicates the time remaining in RSTU until the start of the next UWB AP relative to the start of the current packet.

The UWB Channel field indicates the UWB channel number on which UWB AP occurs after Delta T. The UWB channel is defined in Table 10-9 for the HRP UWB PHY and defined in Table 10-13 for the LRP UWB PHY.

The Preamble Code field indicates the preamble code used by UWB AP. The preamble code is defined in Table 15-7 and 15-7a. The UWB Session Info specifies the information of UWB channel usage per UWB session by using UWB Per-Session Info(s). If UWB Per-Session Info(s) field are included in both NB AP and UWB AP, then ensure the order of UWB Per-Session Info(s) is identical.

When the Type of UWB Per-Session Info field value is one, each of UWB Per-Session Info(s) in UWB Session Info shall be formatted as shown in Figure x3.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Bits: 24** | **5** | **1** | **2** | **8** |
| Block Duration | UWB Channel | Hop Mode | Reserved | Preamble Code |

**Figure x3 —** **UWB Per-Session Info #1 when Type of UWB Per-Session Info field value is one**

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

The UWB Channel field indicates the UWB channel number used by UWB session. The UWB channel is defined in Table 10-9 for the HRP UWB PHY and defined in Table 10-13 for the LRP UWB PHY.

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

The Preamble Code field indicates the preamble code used by UWB session. The preamble code is defined in Table 15-7 and 15-7a.

When the Type of UWB Per-Session Info field value is two, each of UWB Per-Session Info(s) in UWB session Info shall be formatted as shown in Figure x4.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Bits: 24** | **5** | **3** | **8** | **24** |
| Delta T | UWB Channel | Reserved | Preamble Code | Active PeriodDuration |

**Figure x4 —** **UWB Per-Session Info #2 when Type of UWB Per-Session Info field value is two**

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

The UWB Channel field indicates the UWB channel number used by UWB session. The UWB channel is defined in Table 10-9 for the HRP UWB PHY and defined in Table 10-13 for the LRP UWB PHY.

The Preamble Code field indicates the preamble code used by UWB session. The preamble code is defined in Table 15-7 and 15-7a.

The Active Period Duration field indicates the duration of active period within a block of UWB session in RSTU.

When the Type of UWB Per-Session Info field value is three, each of UWB Per-Session Info(s) in UWB session Info shall be formatted as shown in Figure x5.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Bits: 24** | **5** | **1** | **2** | **8** | **24** | **8** | **24** |
| Delta T | UWB Channel | Hop Mode | Reserved | Preamble Code | RoundDuration | Number of Rounds | Active Rounds |

**Figure x5 —** **UWB Per-Session Info #3 when Type of UWB Per-Session Info field value is three**

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

The UWB Channel field indicates the UWB channel number used by UWB session. The UWB channel is defined in Table 10-9 for the HRP UWB PHY and defined in Table 10-13 for the LRP UWB PHY.

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

The Preamble Code field indicates the preamble code used by UWB session. The preamble code is defined in Table 15-7 and 15-7a.

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

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

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

When the Message Control field value is one the Message Content field shall be formatted as shown in Figure y2. The Message Control field value shall be one for UWB AP.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Bit :****3** | **5** | **3** | **4** | **1** | **0/16** | **Variable** |
| UWB AP Type | Reserved | Type of UWB Per-Session Info | Number of UWB Per-Session Info | Reserved | Next UWB AP | UWB Per-Session Info(s) |
| Common Info | UWB Session Info |

**Figure y2 —Message Content field in UWB AP when message control is one**.

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

The UWB AP Type field specifies whether the transmission of UWB AP is periodic or aperiodic. The UWB AP Type field shall have one of the values specified in Table x6.

**Table x6 – Values of the UWB AP Type field**

|  |  |
| --- | --- |
| **The UWB AP Type field value** | **Meaning** |
| 0 | Periodic coordination |
| 1 | Aperiodic coordination |
| 2-7 | Reserved |

The Type of UWB Per-Session Info field specifies the format of UWB Per-Session Info field(s) to be used. The Type of UWB Per-Session Info field shall have one of the values specified in Table x2

The Number of UWB Per-Session Info field is an unsigned integer that specifies the number of UWB Per-Session Info field(s).

The Next UWB AP field indicates the time remaining in RSTU until the start of the next UWB AP. It is not present when the value of UWB AP Type field is zero.

The UWB Session Info specifies the information of UWB channel usage per UWB session by using UWB Per-Session Info(s). If UWB Per-Session Info(s) field are included in both NB AP and UWB AP, then ensure the order of UWB Per-Session Info(s) is identical.

When the Type of UWB Per-Session Info field value is one, each of UWB Per-Session Info(s) in UWB Session Info shall be formatted as shown in Figure x3.

When the Type of UWB Per-Session Info field value is two, each of UWB Per-Session Info(s) in UWB session Info shall be formatted as shown in Figure x4.

When the Type of UWB Per-Session Info field value is three, each of UWB Per-Session Info(s) in UWB session Info shall be formatted as shown in Figure x5.

***Update 10.35.9.2.2 with followings***

***(page 50 line #8 )***

Public addresses shall not change for PUBLIC-ADV-POLL, PUBLIC-ADV-RESP, and PUBLIC-SOR while initiator(s) and responder(s) are in ranging session.

An initiator shall be able to initialize its public address in AP to a new value. It is up to implementation to determine how often the public address in AP may be changed.

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