**IEEE P802.15**

**Wireless Personal Area Networks**

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| Project | IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs) | |
| Title | **Proposal for compact frame support for hyper block mode (CID#50)** | |
| Date Submitted | May 16, 2024 | |
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| 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.

Rev 1: Minor corrections as 0x10 is already accepted to use in 15-24-123r2.

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

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Name** | **Index#** | **Pg** | **Sub-Clause** | **Ln** | **Comment** | **Proposed Change** | **Disposition** |
| Alex Krebs | 50 | 27 | 9.3.2.4 | 1 | Uniqueness of Nonce not guaranteed for Hyperblock Mode 10.13.3.5 | Clarify how/if encryption applies/does not apply to Hyperblock mode. Alternatively, change 10.13.3.5 to clarify that Hyperblock mode must not use Compact frames. | Revised |

**Disposition Detail:**

Some UWB applications can make use of Narrow Band (NB) channels as part of its operation for coordination or control, etc. For example, MMS has NB-assisted mode as one of its operation mode, and during whole transaction, initialization phase portion can be happening through NB channel while actual UWB ranging runs in UWB radio channel. In this kind of cases, information to trigger hyper block mode configuration also can be signalled through NB channel via compact frames.

Here, we are proposing SoR message to indicate starting point of Hyper Block mode so that responders anticipate upcoming Hyper Block mode and can configure Hyper Block mode reception from received IEs in the channel.

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

***Change the chapter 10.38.10.6 to add mode when Message Control is 0x20 as follows:***

**10.38.10.6 Start of Ranging Compact frame**

This is the Start of Ranging Compact frame used by the initiator during the initialization phase. The Start of Ranging Compact frame shall be formatted as shown in Figure 59.

|  |  |  |  |
| --- | --- | --- | --- |
| **Octets: 3** | **1** | **variable** | **2** |
| RPA hash | Message Control | Message Content | FCS |

**Figure 59—Start of Ranging Compact frame format**

The RPA Hash field shall be set as specified in 10.38.10.2.1.

The Message Control field value shall be one of the values : 0x00, 0x10 or 0x20. This value determines the formatting of the Message Content field.

The Message Content field shall be formatted as shown in Figure 60, when Message Control field value is 0x00.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Octets: 4** | **1** | **6** | **1** | **7** | **3** | **2** |
| Time Offset | NB Channel Seed | NB Channel Map | Management PHY Configuration | Management MAC Configuration | Ranging  PHY Configuration | Ranging MAC Configuration |

**Figure 60—Format of the Message Content field in the Start of Ranging Compact frame**

The Time Offset field shall be as per 10.38.10.3.12

The NB Channel Seed field shall be as per 10.38.10.3.14

The NB Channel Map field shall be set as per 10.38.10.3.7

The Management PHY Configuration field shall be set as per 10.38.10.3.15

The Management MAC Configuration field shall be set as per 10.38.10.3.10

The Ranging PHY Configuration field shall be as per 10.38.10.3.8

The Ranging MAC Configuration field shall be set as per 10.38.10.3.9

………

When the Message Control field value is 0x20, the ranging executed in Hyper Block mode. In this case, responders assume Hyper Block mode starts from the specified Time Offset and should acquire configuration information from HBS IE and ARC IE. The Message Content field shall be formatted as shown in Figure 60B.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Octets: 4** | **1** | **6** | **1** | **variable** |
| Time Offset | NB Channel Seed | NB Channel Map | Block Description List Length | Block Description List |

**Figure 60B—Format of the Message Content field in the Start of Ranging Compact frame**

**(for hyper block)**

The Time Offset field shall be as per 10.38.10.3.12

The NB Channel Seed field shall be as per 10.38.10.3.14

The NB Channel Map field shall be set as per 10.38.10.3.7

Block Description List Length field specifies the number of Block Description List elements in the Block Description List field.

Block Description List field contains Block Description List element each of which is structured as per Figure 60C.

|  |  |  |  |
| --- | --- | --- | --- |
| **Octets: 1** | **1** | 1 | 2 |
| Block Index | Block Duration | Round Duration | Slot Duration |

**Figure 60C —Format of the Block Description List element**

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

The Block Duration field is an unsigned integer that specifies the duration of the block. The unit of the Block Duration field is the number of rounds in the block,

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