802.11ba Draft Specification

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| Encoding for TBD fields |
| Date: 2018-05-07 |
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Abstract

This submission proposes spec text to resolve TBD related to encoding of fields in WUR Mode element, WUR Operation element, and WUR Mode element.

Revision History:

* Rev 0: Initial version of the document

***Editing instructions formatted like this are intended to be copied into the TGba Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGba Editor: Editing instructions preceded by “TGba Editor” are instructions to the TGba editor to modify or insert material in the TGba draft. As a result of adopting the changes, the TGba editor will execute the instructions rather than copy them to the TGba Draft.***

**Discussion:**

The encoding of the following fields is TBD in D0.2.

* Supported Bands field in WUR Capabilities element
* WUR Beacon Period in WUR Operation element
* Duty Cycle Period Units in WUR Operation element
* Duty Cycle Period in WUR Mode element
* Minimum wake-up duration field in WUR Operation element
* On Duration field in WUR Mode element

In the following, we propose encoding method for these TBD fields.

**Supported Bands field in WUR Capabilities element:**

We propose to have 1 bytes with encoding shown below.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **B0** | **B1** | **B2-B7** |
| Band | 2.4 GHz | 4.9 and 5 GHz | Reserved |
| Bits | 1 | 1 | 6 |

**WUR Beacon Period in WUR Operation element:**

We have agreed to have granularity of 1 TU. We propose that the size of the WUR Beacon Period is 2 bytes to follow the same design of PCR Beacon period with a maximum of 65536 TU. Note that we do not expect the WUR Beacon period to be longer than 65536 TU(s). We also expect that WFA will come out some default value like current Beacon period.

**Duty Cycle Period Units in WUR Operation element and Duty Cycle Period in WUR Mode element:**

We propose that the Duty Cycle Period Units field has size 2 bytes and granularity of 4 us. We choose this granularity because the minum unit of symbol is 4 us, and the flexibility of the proposal allows any indication up to 262,144 us. We proposal that the Duty Cycle Period field has size 2 bytes. The maximum duty cycle period can be up to 4\*2^32 us ≈ 16384 seconds.

**Minimum wake-up duration field in WUR Operation element and On Duration field in WUR Mode element:**

We propose that the Minimum wake-up duration field has size 1 bytes in unit of 256 us. The reason is that frames are in the order of 200us and due to EDCA considerations, granularity less than 256us may not be that useful

We propose that the On Duration field has size 4 bytes in unit of 256 us. The maximum value of the Duty cycle period can be coverd. The exact indication is the minmum of the indicated duty cycle period and the value represented by the On Duration field.

**TGba Editor: *Instruction: Modify 9.4.2.263 WUR Capabilities element as shown below (Track Change On)***

* WUR Capabilities element

A WUR STA declares that it has WUR capability by transmitting the WUR Capabilities element. The WUR Capabilities element contains a number of fields that are used to advertise WUR capabilities of a WUR STA.

The WUR Capabilities element is defined in Figure 9-589b (WUR Capabilities element format).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Element ID** | **Length** | **Element ID Extension** | **Supported Bands** | **PCR Transition Delay** | **Nonzero Length Frame Body Support** |
| Octets: | 1 | 1 | 1 | 1 | TBD | TBD |
| * WUR Capabilities element format
 |

The Element ID, Length, and Element ID Extension fields are defined in 9.4.2.1 (General).

For WUR AP, the Supported Bands field is reserved.

For WUR non-AP STA, the Supported Bands field indicates the supported bands for the WUR operating channel. The format of the Supported Bands field is shown in Figure xxx. B0 of the Supported Bands field is set to 1 to indicate the support of 2.4 GHz band. Otherwise, B0 of the Supported Bands fieldis is set to 0. B1 of the Supported Bands field is set to 1 to indicate the support of 4.9 and 5 GHz band. Otherwise, B1 of the Supported Bands fieldis is set to 0.

|  |  |  |  |
| --- | --- | --- | --- |
|  | B0    | B1 | B2 B7 |
|  | 2.4 GHz | 4.9 and 5 GHz | Reserved |
| Bits: | 1 | 1 | 6 |

Figure xxx- Supported Bands field format

For WUR AP, the PCR Transition Delay field is reserved.

For WUR non-AP STA, the PCR Transition Delay field indicates the PCR transition delay from doze state to awake state of the WUR non-AP STA after the WUR non-AP STA receives wake-up frame.

For WUR AP, the Nonzero Length Frame Body Support field is reserved.

For WUR non-AP STA, the Nonzero Length Frame Body Support field indicates supportability of non-zero length frame body.

**TGba Editor: *Instruction: Modify 9.4.2.264 WUR Operation element as shown below (Track Change On)***

* WUR Operation element

The WUR Operation element contains the set of parameters necessary to support the WUR operation. The format of the WUR Operation element is defined in Figure 9-589c (WUR Operation element format).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Element ID** | **Length** | **Element ID Extension** | **Minimum Wake-up Duration** | **Duty Cycle Period Units** | **WUR Operation class** | **WUR Channel** | **WUR Beacon Period** |
| Octets: | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 |
| * WUR Operation element format
 |

The Element ID, Length, and Element ID Extension fields are defined in 9.4.2.1 (General).

The Minimum Wake-up Duration field indicates the minimum on duration of the WUR duty cycle operation (see 31.4 (WUR duty cycle operation)) in units of 256 µs.

The Duty Cycle Period Units field indicates the basic unit of the period of the WUR duty cycle operation (see 31.4 (WUR duty cycle operation)). The granularity of the Duty Cycle Period Units field is 4 µs.

The WUR Operating Class field indicates the operating class in use for transmission of WUR frame from the WUR AP to the WUR non-AP STA. The encoding is the same as the definition of Operating Class field in 9.4.1.22 (Operating Class and Channel field)

The WUR Channel field indicates the channel in use for transmission of WUR frame from the WUR AP to the WUR non-AP STA. The encoding is the same as the definition of Channel field in 9.4.1.22 (Operating Class and Channel field).

The WUR Beacon period field indicates the period of WUR Beacon frame.

**TGba Editor: *Instruction: Modify 9.4.2.262 WUR Mode element as shown below (Track Change On)***

* WUR Mode element

(..existing texts..)

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| * Subfields of the WUR Parameters field from WUR non-AP STA
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| **Subfield** | **Definition** | **Encoding** |
| On Duration | Indicates the preferred On Duration that the WURx of the WUR non-AP STA will be in WURx awake state for each the WUR duty cycle schedule (see 31.4 (WUR duty cycle operation)). | The size of the field is 4 bytes. The unit of the field is 256 µs. |
| Duty Cycle Period | Indicates the preferred elapsed time between the start times of two successive WUR duty cycle schedules with units indicated by the Duty Cycle Period Units field in the most recently received WUR Operation element from the associated WUR AP (see 31.4 (WUR duty cycle operation)). |  The size of the field is 2 bytes. |