IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Comment Resolution LB253 Parameters – Parameters Part 3 | | | | |
| Date: 2021-01-08 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Christian Berger | NXP | 350 Holger Way, San Jose, CA |  | [christian.berger@nxp.com](mailto:christian.berger@nxp.com) |
| Erik Lindskog | Samsung |  |  | [e.lindskog@samsung.com](mailto:e.lindskog@samsung.com) |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Abstract

This submission proposes the comment resolution of CIDs related to the Ranging Parrameters Element in LB253, changes are relative to Draft 3.0.

Revisions:

1. Started on spec text
2. Fixed typo, made changes relating to Passive TB Ranging, added Erik Lindskog as author

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGax Draft. This introduction is not part of the adopted material.

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

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

**The text preceded by “Discussion” is not part of the adopted changes.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

**9.4.2.297 RSTA Availability Window element**

The format of the RSTA Availability Window element is shown in Figure [9-788edc](#F09o788edc) (RSTA Availability Window element format).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Element ID | Length | Element ID Extension | RSTA Availability Information |
| Octets: | 1 | 1 | 1 | Variable |

1. Figure 9-788edc—RSTA Availability Window element format

The Element ID, Length and Element ID Extension fields are defined in [9.4.2.1](#H09o4o2o1).

The RSTA Availability Information field format is shown in Figure [9-788edd](#F09o788edd) (RSTA Availability Information field format).

TGaz Editor: Modify “Figure 9-788edd—RSTA Availability Information field format” on page 71 (line 5) as follows

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | ~~Count~~  Header | Availability Window Information subfield-1 | …. | Availability Window Information subfield-n |
| Octets: | 1 | 4/5 | … | 4/5 |

1. Figure 9-788edd—RSTA Availability Information field format

TGaz Editor: Modify these paragraphs and add “Figure 9-788xxx—Header subfield format” on page 71 (line 7) as follows:

The Header subfield format in the RSTA Availability Information field is shown in Figure [9-788xxx](#F09o788ede) (Header subfield format).

|  |  |  |
| --- | --- | --- |
|  | B0 B6 | B7 |
|  | Count | Passive TB Ranging Availability Window |
| Bits | 7 | 1 |

1. Figure 9-788XXX—Header subfield format

The Count subfield in the Header subfield indicates the number of Availability Window Information subfields included in the RSTA Availability information field.

The Passive TB Ranging Availability Window subfield indicates the format of the Availability Window Information subfields.

When the Passive TB Ranging Availability Window subfield is set to zero, the format of each Availability Window Information subfield is shown in Figure [9-788ede](#F09o788ede) (Availability Window Information field format).

B0 B15 B16 B22 B23 B24 B31

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Partial TSF  Timer | Duration | Reserved | Periodicity |  |

Bits: 16 7 1 8

1. Figure 9-788ede—Availability Window Information field format (#1947)

The Partial TSF Timer subfield is derived as described in [9.4.2.167](#H09o4o2o167) (Fine Timing Measurement Parameter element) and indicates the TSF timer of the RSTA at the start of first availability window. (#**1132,** #**2435,** #**2436**)

The Duration subfield in the Availability Window Information field indicates the duration of the corresponding Availability Window in units of 100 µs (giving it a value from 0 to ~12.7 ms). The value of 0 is Reserved. (#**1367**, #**1373**)

The Periodicity subfield in an Availability Window Information subfield indicates the periodicity of that availability window in units of the value of the Beacon Interval field in the most recent beacon sent by the RSTA (Giving it a value from 0 to ~25.5 s when the beacon interval is 100 TU). (#**1376**)

TGaz Editor: Add this paragraph and “Figure 9-788yyy—Passive Availability Window Information field format” on page 72 (line 1) as follows:

When the Passive TB Ranging Availability Window subfield is set to one, the format of each Availability Window Information subfield is shown in Figure [9-788yyy](#F09o788ede) (Passive Availability Window Information field format).

B0 B15 B16 B22 B23 B24 B31 B32 B39

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Partial TSF  Timer | Duration | Reserved | Periodicity | Passive TB Ranging parameters ~~(Optional)~~(#**1646**) |

Bits: 16 7 1 8 8

**Figure 9-788yyy—****Passive Availability Window Information field format (#1947)**

The Partial TSF Timer, Duration and Periodicity subfields are the same as in the Availability Window Information field. The Passive TB Ranging parameters subfield format is shown in Figure [9-788edf](#F09o788edf) (Passive TB Ranging parameters subfield). **(#1646*)***

|  |  |  |
| --- | --- | --- |
|  | B0 B3 | B4 B7 |
|  | Format and Bandwidth | Reserved |
| Bits | 6 | 2 |

1. Figure 9-788edf—Passive TB Ranging parameters subfield

The Format and Bandwith subfield is defined in Table [9-322h23fa](#T09o322h23fa) (Format and Bandwidth subfield), and indicates the requested or allocated PPDU format and nominal bandwidth used to transmit the I2R/R2I NDP exchanged as part of the Passive TB Ranging measurement exchangein the Passive TB Ranging availability window. Depending on the medium availability, the bandwidth used for the exchanged frames is equal to or smaller than the nominal bandwidth. (#**1646**, #**1103, #3310**)

**9.4.2.298 Ranging Parameters element**

TGaz Editor: Modify “Figure 9-788edh—Ranging Parameters field format” on page 73 (line 9) as follows

The format of the Ranging Parameters field is shown in Figure [9-788edh](#F09o788edh) (Ranging Parameters field format)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 B1 | B2 B6 | B7 | B8 B9 | B10 B11 | B12 | B13 | B14 | B15 |
|  | Status  Indication | Value | I2R LMR Feedback | Reserved | Ranging  Priority | R2I TOA Type | I2R TOA Type | R2I AOA Request | I2R AOA Request |
| Bits: | 2 | 5 | 1 | 2 | 2 | 1 | 1 | 1 | 1 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B16 B21 | B22 | B23 | B24 B26 | B27 B29 | B30 | B31 | B32 B34 | B35 B37 |
|  | Format  and Bandwidth | Immediate R2I  Feedback | Immediate I2R  Feedback | Max I2R Repetition | Max R2I Repetition | Reserved | Reserved | Max R2I STS ≤ 80 MHz | Max R2I  STS > 80 MHz |
| Bits: | 6 | 1 | 1 | 3 | 3 | 1 | 1 | 3 | 3 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | B38 B39 | B40 B41 | B42 B45 | B45 B47 | B48 B55 |
|  | Max R2I LTF Total | Max I2R LTF Total | Max I2R STS ≤ 80 MHz | Max I2R STS > 80 MHz | BSS Color Information |
| Bits: | 2 | 2 | 3 | 3 | 8 |

**Figure 9-788edh—Ranging Parameters field format (#1947, #TC707r3)**

TGaz Editor: Move the following paragraph from page 76 (line 1) as follows

TGaz Editor: Add the following paragraph to page 76 (line 18) as follows

The Max I2R STS ≤ 80 MHz subfield indicates for bandwidths less than or equal to 80 MHz the maximum number of space-time streams to be used in I2R NDP in the session.

The Max I2R STS > 80 MHz subfield indicates for bandwidths greater than 80 MHz the maximum number of space-time streams to be used in I2R NDP in the session.

The BSS Color Information subfield has the same format as in the BSS Color Information field in the HE Operation element. Each subfield of the BSS Color Information field is set to the same value, as in the HE Operation element transmitted by an RSTA. The BSS Color Information field is reserved in the IFTMR frame. (#**1710**, #**2079**)

TGaz Editor: Modify “Figure 9-788edj—TB Specific subelement format” on page 78 (line 10) as follows

The TB Specific subelement is included in the IFTMR frame to describe the requested set of parameters that the initiator proposes to use and in the initial Fine Timing Measurement, if the initiator and the responder successfully negotiate a Fine Timing Measurement session where the negotiated ranging protocol is TB (#**2434**).

The format of the TB Specific subelement is as shown in Figure [9-788edj](#F09o788edj) (TB Specific subelement format).

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Subelement ID (1) | | Length | | AID / RSID | | Device Class | | Full Bandwidth UL MU-MIMO | | Trigger Frame MAC Padding Duration | Max Session Exp |
| Bits: | 8 | | 8 | | 16 | | 1 | | 1 | | 2 | 4 |  |
|  |  | | |  | | | |
|  | Passive TB Ranging | Reserved | | | | Availability Window | | | |
| Bits: | 1 | 7 | | | | Variable | | | |

1. Figure 9-788edj—TB Specific subelement format (#1951, #1710)

The Subelement ID and Length fields are defined in 9.4.3 (Subelements). (#**3854**)

TGaz Editor: Move the following paragraph here from page 79 (line 15) as follows

The AID/RSID field contains an identifier for the ISTA for the duration of the FTM session. If the ISTA is associated with the RSTA the value is set to the ISTA’s AID. If the ISTA is not associated with the RSTA, the AID/RSID field is set to the RSID which has the same length as the AID and is assigned by the RSTA to identify the unassociated ISTA. (#**1709**, #**2437**, #**2078**)

The Device Class and Full Bandwidth UL MU-MIMO fields correspond to the Device Class and Full Bandwidth UL MU-MIMO fields defined in Table 9-321b (Subfields of the HE PHY Capabilities Information field). For associated STAs the value of the Device Class and Full Bandwidth UL MU-MIMO subfields are equal to the value of the Device Class and Full Bandwidth UL MU-MIMO fields respectively that are exchanged during association.

The Trigger Frame MAC Padding Duration field correspond to the Trigger Frame MAC Padding Duration field defined in Table 9-322a (Subfields of the HE MAC Capabilites Information field). For associated STAs the value of the Trigger Frame MAC Padding Duration field is equal to the value that was exchanged during association**.**

The Max Session Exp field is the time before which a new measurement exchange between the ISTA and RSTA should be initiated and completed. This value is computed as 2(Max Session Exp + 8) ms. (#**3840**) The Max Session Exp field is reserved in an IFTMR frame. (#**1475**, #**2073**)

The Passive TB Ranging field is set to 1 by the Initiator to request Passive TB Ranging operation, otherwise it is set to 0. (#**1103**) The Passive TB Ranging field is set to 1 by the Responder to grant Passive TB Ranging operation, otherwise it is set to 0.

The definition of Availability Window field is either an ISTA Availability Window element, see Figure [9-788eda](#F09o788eda) (ISTA Availability Window element format), when the containing Ranging Parameters element is in an IFTMR frame; or an RSTA Availability Window element, see Figure [9-788edc](#F09o788edc) (RSTA Availability Window element format), when the containing Ranging Parameters element is in an FTM frame.

Figure [9-788edk](#F09o788edk) (Example of a bitmap with 200 TU periodicity signaled in the ISTA Availability Window element), [9-788edl](#F09o788edl) (Example of mapping of ISTA’s availability bitmap to RSTA’s TSF) and [9-788edm](#F09o788edm) (Example of how an RSTA assigns an Availability Window to an ISTA) together show an example of how an RSTA assigns an availability window from the received Availability Window element of the ISTA. Figure [9-788edk](#F09o788edk) (Example of a bitmap with 200 TU periodicity signaled in the ISTA Availability Window element), shows the bitmap in the ISTA Availability Information field of the ISTA Availability Window element included with an IFTMR frame. The bitmap has periodicity of 200 TUs and the RSTA Beacon Interval is 100 TUs. Figure [9-788edl](#F09o788edl) (Example of mapping of ISTA’s availability bitmap to RSTA’s TSF) shows how the RSTA calculates ISTA’s periodic availability from this bitmap relative to RSTA TSF. Finally, Figure [9-788edm](#F09o788edm) (Example of how an RSTA assigns an Availability Window to an ISTA) shows how the RSTA constructs an availability window with periodicity of 200 TUs requested by the ISTA and with a window duration of 10 TUs. (#**2435**, #**2436**) The shaded region indicates the location of the assigned availability windows. (#**1656**)

TGaz Editor: Move the following paragraph to page 78 (line 15) as follows

The Ranging Parameters element in the IFTMR frame includes a Non-TB specific subelement and/or a TB specific subelement; and the Ranging Parameters element in the corresponding initial Fine Timing Measurement frame includes either a Non-TB specific subelement or a TB specific subelement, if the Status Indication subfield in the Ranging Parameters field is set to Success to indicate the range measurement protocol selected by the responder for the negotiated FTM session. (#**1658, #1103**)

**11.21.6.1.3 Passive TB Ranging overview**

TGaz Editor: Move the following paragraph to page 119 (line 12) as follows

In order to announce the scheduling and parameters of the availability window for Passive TB Ranging, the RSTA includes an RSTA Availability Window element (see 9.4.2.297 (RSTA Availability Window element)) in its Beacon frame; see 9.3.3.2 (Beacon frame format). Here the Passive TB Ranging Availability Window subfield in the Header subfield in the RSTA Availability Information field in the RSTA Availability Window element is set to 1 to indicate that this is an RSTA Availability Window element that is used to signal availability windows for Passive TB Ranging. (#1646)

**11.21.6.3.3 Negotiation for TB and Non-TB Ranging measurement exchange**

TGaz Editor: Move the following paragraph to page 127 (line 11) as follows

If the RSTA includes a TB-specific subelement in an IFTM frame and the Status Indication field in the IFTM frame is set to 1, then the RSTA shall include an RSTA Availability Window element in the IFTM frame. The RSTA Availability Information field in the RSTA Availability Window element shall contain exactly one Availability Window Information field. The Availability Window Information field represents the availability window assigned by the RSTA to the ISTA. The Passive TB Ranging Availability Window subfield in the Header subfield in the RSTA Availability Information field in this RSTA Availability Window element set to 0. (#1646, #3951)