IEEE P802.11
Wireless LANs

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| LB 271 CR for QoS Characteristics element (Part 3) |
| Date: April 1, 2023 |
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 Abstract

This submission proposes resolutions for following CIDs received for TGbe LB271:

18017, 15691, and 16662.

**Revisions:**

* Rev 0: Initial version of the document.

***TGbe editor: The baseline for this document is 11be D3.0***

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 TGbe Draft. This introduction is not part of the adopted material.

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

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

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| **CID** | **Commenter** | **Clause** | **Pg/Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 18017 | Duncan Ho | 9.4.2.316 | 299.39 | The bandwidth info is missing in the QoS characteristics element for the Medium Time computation for p2p | Specify the bandwidth info (e.g., see 11-23-0105-01-00be-cr-for-9-4-2-316-qos-charateristics-element-misc for more detailed proposal) so the proper medium time can be computed. | Revised.Agreed in principle. We should add the Bandwidth information in the QoS characteristics element. To support the case that a non-AP MLD can use more than one link between itself and a p2p peer, the QoS characteristics element needs to include the medium time and bandwidth per link.The details of the proposed resolution are included in this document.**TGbe editor, please make the changes included in this document.** |
| 15691 | Dibakar Das | 35 | 473.06 | The P2P operation in wifi-7 is somewhat missing a resource request mechanism similar to UL operations. In UL we have both semi-static (SCS) and dynamic (BSR) mechanisms for a STA to signal its requirements. Suggest to have a similar mechanism for P2P. | 1 Improve upon the QoS Characteristics element design to allow a STA to signal the BW, channel number information for the requested P2P link. 2. Add a dynamic mechanism that allows a STA to report its instantenous resource request and clarify how that will work with the SCS based mechanism, | Revised.Same resolution as CID18017. |
| 16662 | Liwen Chu | 35.17 | 35.17 | The AP's schedule for direct link traffic should gurantee the agreeed medium time under the reference BW in QoS Chracteristics element of SCS Response frame | As in comment | Revised.Add text to clarify.**TGbe editor, please make the changes tagged as #16662 included in this document.** |

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**To the editor: please modify section 9.4.2.316 as follows:**

* + - 1. **QoS Characteristics element**

The QoS Characteristics element contains a set of parameters that define the characteristics and QoS expec- tations of a traffic flow, in the context of a particular non-AP EHT STA, for use by the EHT AP and the non- AP EHT STA in support of QoS traffic transfer using the procedures defined in 11.25.2 (SCS procedures) and 35.8 (Restricted TWT (R-TWT)).

The element information format comprises the items as defined in this subclause, and the structure is defined in [Figure 9-1002au (QoS Characteristics element format)](#bookmark237).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Element ID | Length | Element IDExtension | Control Info | Minimum Service Interval | Maximum Service Interval | Minimum Data Rate |

Octets: 1 1 1 4 4 4 3

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Delay Bound | Maximum MSDUSize | Service Start Time | Service Start Time LinkID | Mean Data Rate | Burst Size | MSDULifetime |

Octets: 3 0 or 2 0 or 4 0 or 1 0 or 3 0 or 4 0 or 2

|  |  |  |
| --- | --- | --- |
| MSDUDelivery Ratio | MSDUCount Exponent | Direct Link Info |

Octets: 0 or 1 0 or 1 0 or 3 x (Number of Direct links + 1)

**Figure 9-1002au—QoS Characteristics element format**

The structure of the Control Info field is defined in [Figure 9-1002av (Control Info field format)](#bookmark238).

B0 B1 B2 B5 B6 B8 B9 B24 B25 B28 B29 B31

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Direction | TID | User Priority | Presence Bitmap Of Additional Parameters |  Number of Direct links | Reserved |

Bits: 2 4 3 16 4 3

**Figure 9-1002av—Control Info field format**

The Element ID, Length, and Extended Element ID fields are defined in [9.4.2.1 (General)](#bookmark109). The subfields of the Control Info field are defined as follows:

* […]
* The Number of Direct Links subfield contains the number of Direct Link Info fields contained in this element. This field is reserved if the Direction subfield is equal to any value but 2 (Direct link).

The structure of the Direct Link Info field is defined in Figure 9-1002au (Direct Link Info field format). This field is present only if the Number of Direct Links subfield is greater than zero.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | B0 B3 | B4 B15 | B16 B19 | B20 B23 |
|  | LinkID | Medium Time | Bandwidth | Reserved |
| Bits: | 4 | 12 | 3 | 5 |
| Figure 9-1002au – Direct Link Info field format |

The subfields of the Direct Link Info field are defined as follows:

* The LinkID subfield specifies the link identifier of the link that corresponds to the direct link for which the medium time and bandwidth are requested.
* The Medium Time field contains an unsigned integer that specifies the medium time, in units of 256 microseconds, requested by the STA for direct link transmissions on the link corresponding to LinkID as the average medium time needed in each second, based on the bandwidth indicated in the Bandwidth field for direct link transmissions and based on the assumption that all the direct link transmissions associated with this traffic flow were to take place only on the link corresponding to the LinkID. The values from 3,906 to 4,095 are reserved.
* The Bandwidth field specifies the maximum bandwidth the STA can operate for direct link transmissions on the link specified in the LinkID field. This field is used to compute the medium time requested in the Medium Time field and this field is encoded as shown in Table 9-401q. The total resource requested is the product of the medium time and bandwidth.

NOTE 1 — If the actual bandwidth scheduled is half of what is specified in the Bandwidth field, the scheduled medium time needs to be doubled that of the Medium Time field to maintain the same medium time bandwidth product. Further, the Medium Time field value needs to be scaled corresponding to the Max Service Interval field of the Direct Link transmission to determine the scheduled medium time.

|  |
| --- |
| Table 9-401s Bandwidth values |
| Value | Bandwidth |
| 0 | 20MHz |
| 1 | 40MHz |
| 2 | 80MHz |
| 3 | 160MHz |
| 4 | 320MHz |
| 5 - 7 | Reserved |

**To the editor: please modify section 35.17 as follows for CID16662:**

35.17 EHT SCS procedure

[…]

The QoS Characteristics element is a reference for the EHT AP’s scheduling. An EHT AP should schedule transmission of downlink frames such that the delay bound and minimum data rate requested are met for the downlink Data frames if the Direction subfield of the QoS Characteristics element indicates downlink. An EHT AP should enable the transmission of uplink frames from the EHT STA with an interval that falls between the requested minimum and maximum service intervals and the AP should meet the minimum data rate requested if the Direction subfield of the QoS Characteristics element indicates uplink. An EHT AP should enable the transmission of direct link frames from the EHT STA to another STA on the link specified in the LinkID subfield of the Control Info field with an interval that falls between the requested minimum and maximum service intervals (#16662)and the AP should meet the medium time and bandwidth requested if the Direction subfield of the QoS Characteristics element indicates direct link.

Do you agree to the resolution provided in doc 11-23/0800r0 for CID 18017, 15691, 16662?