IEEE P802.11
Wireless LANs

|  |
| --- |
| Resolution for LB266 CIDs related to 9.4.2.316 QoS Characteristics element Part 3 (Bandwidth and misc) |
| Date: January, 2023 |
| Author(s): |
| Name | Affiliation | Address | Phone | Email |
| Duncan Ho | Qualcomm Inc. | 5665 Morehouse Dr. San Diego CA 92121 USA | +1 (858) 845-3214 | dho@qti.qualcomm.com |
| Alfred Asterjadhi |  |  |  |
| Abdel Karim Ajami |  |  |  |
| Abhishek Patil |  |  |  |
| George Cherian |  |  |  |
| Gaurang Naik |  |  |  |
| Yanjun Sun |  |  |  |

 Abstract

This submission proposes a resolution for the following 5 CIDs for TGbe (LB266).

10448, 12712, 12718, 12780, 13222

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: modified the resolution of CID 12718
* Rev 2: modified the resolution of CID 13222

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 TGaxbe 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.***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Page.Line** | **Comment** | **Proposed Change** | **Resolution** |
| 10448 | Yonggang Fang | 71.01 | The senstence "In an implementation, this function may be distributed into the MLD lower MAC sublayers for the links" is for a reference of implementation. It is not necessay to be here. Please remove this. | Suggest to delete this. | **Accepted** |
| 12712 | Pascal VIGER | 200.55 | According to SCS mechanism, a QoS Characteristics element provides parameters that finely describes the LL traffic characteristics. There is a need to identify which link(s) the SCS can use. If linkID is kept in QoS Characteristics element, then more than one QoS Characteristics element shall be considered, one per link. | as per comment | **Rejected**The parameters in the QoS Characteristics are at MLD level so including linkIDs will not be aligned with the current QoS parameters definition. Besides, 802.11be already has the TID-to-link mapping, which can map a TID to a set of link(s). Therefore, TID-to-link mapping can be used to achieve the same as in the comment. |
| 12718 | Pascal VIGER | 252.02 | In order to better support P2P traffic, there is a need to update QoS Characteristics element format by specific information related to P2P (e.g. for TXS) : Link Id, expected duration and BW, the STA AID of P2P recipient STA. By knowing recipient P2P STA's AID, AP can invite it to join a same TWT session so STA is awake at SP | as per comment | **Revised**Agreed partially with the comment. Currently the BW (bandwidth) info is missing in the QoS characteristics element. Do not think other info mentioned in the comments are needed.Added a list of (Link ID, Medium Time, Bandwidth) tuples to the QoS characteristics element. The changes in the element support multiple p2p links in terms of element/field structure but it’s limited to signaling only a single link for this release of the 11be spec.**Tgbe editor, please make changes as shown in 11-22/0150r2 tagged 12718** |
| 12780 | Romain GUIGNARD | 251.40 | For direct link traffic, the information of the receiving peer STA could be valuable to help the AP in its scheduling and for instance to avoid multiple communication to the same STA (P2P and DL) | Add an information to inform the AP of the peer receiver STA in case of direct link communication. | **Rejected**It’s not clear what specific information the commenter is suggesting. |
| 13222 | Evgeny Khorov | 66.54 | It is not clear, how a STA can indicate the current amount of required channel time for direct-link operation | Add the corresponding mechanism | **Revised**The STA indicates the requested channel time in the “Medium Time” field in the QoS characteristics element. If this changes, the STA could send an updated QoS characteristics element to update the AP.The Medium Time field description was inadvertently removed in D2.3 due to a missing CID tag #10673 that tags the removed paragraph in 22/1457r1Also removed the TCLAS mentioning in the User Priority subfield in the QoS characteristics element. The UP in the TCLAS is used for filtering DL incoming packets and it’s not used for assigning the UP of the packets.Restored the Medium Time field description from D2.2**Tgbe editor, please make changes tagged as 13222 as shown in 11-22/0150r2** |

Proposed text changes:

***TGbe editor: modify subclause 9.4.2.316 as follows:***

9.4.2.316 QoS Characteristics element

The QoS Characteristics element contains a set of parameters that define the characteristics and QoS expectations 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 35.9 (Restricted TWT (r-TWT)).

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

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|    | Element ID | Length | Element ID extension | Control Info | Minimum Service Interval | Maximum Service Interval | Minimum Data Rate | Delay Bound |
| Octets: | 1 | 1 | 1 | 4 | 4 | 4 | 3 | 3 |
|  | Maximum MSDU Size | Service Start Time | Mean Data Rate | Burst Size | MSDU Lifetime | MSDU Delivery Info | Direct link Info |
| Octets: | 0 or 2 | 0 or 4 | 0 or 3 | 0 or 4 | 0 or 2 | 0 or 1 | 0 or 3 x (Number ofDirect links)(#12718) |
| Figure 9-1002as – QoS Characteristics element format |

The structure of the Control Info field is defined in Figure 9-1002at (Control Info field format).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 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(#12718) | Reserved |
| Bits: | 2 | 4 | 3 | 16 | 4 | 3 |
|  | Figure 9-1002at – Control Info field format |

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

The subfields of the Control Info field are defined as follows:

* The Direction subfield specifies the direction of data described by this element as defined in Table 9-401p (Direction subfield encoding).

|  |
| --- |
| Table 9-401p - Direction subfield encoding  |
| Bit 5 | Bit 6 | Usage |
| 0 | 0 | Uplink, defined as follows: * MSDUs or A‑MSDUs are sent from the non-AP STA to the AP.
 |
| 1 | 0 | Downlink, defined as follows: * MSDUs or A‑MSDUs are sent from the AP to the non-AP STA.
 |
| 0 | 1 | Direct link (MSDUs or A‑MSDUs are sent from the non-AP STA to another non-AP STA). |
| 1 | 1 | Reserved. |

* The TID subfield contains the TID value of the data frames that are described by this element. The TID subfield is set to the same value as the User Priority field. The values 8~15 are reserved.
* The User Priority subfield contains the user priority value (0~7) of the data frames that are described by this element. (#13222)
* The Presence Bitmap of Additional Parameters subfield contains a bitmap where the ith entry of the bitmap is set to 1 if the ith field starting from the Maximum MSDU Size field is present in this element. For each field starting from the Maximum MSDU Size field, the value 0 is reserved unless otherwise stated(#12718).
* (#12718)
* The Number of Direct Links subfield contains the number of Direct Link Info fields contained in this element and this field is reserved if the Direction subfield is set to any value other than 2 (Direct link). The values 0, 2 to 15 are reserved (#12718).

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. (#12718)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | B0 B3 | B4 B15 | B16 B18 | B19 B23 |
|  | Link ID | Medium Time | Channel Width | 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: (#12718)

* The Link ID subfield specifies the link identifier of the link between the non-AP MLD and the AP MLD that corresponds to the direct link for which the medium time and channel width 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 Link ID as the average medium time needed in each second, based on the channel width indicated in the Channel Width 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 Link ID. The values from 3,906 to 4,095 are reserved.
* The Channel Width field specifies the maximum channel width the STA can operate for direct link transmissions on the link specified in the Link ID 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 channel width.

NOTE 1 — If the actual channel width scheduled is narrower than the value specified in the Channel Width field, the scheduled medium time needs to be increased to maintain the same medium time channel width product. Further, the Medium Time field value needs to be scaled corresponding to the selected service interval for the Direct Link transmission to determine the scheduled medium time.

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

(#13222)The Medium Time field contains an unsigned integer that specifies the medium time, in units of 256 micro-seconds per second, requested by the STA as the average medium time needed in each second.(#11699) The four MSB of the Medium Time field are reserved. The values from 3906 to 4095 are reserved. (#13247)This field is present only if the Direction subfield is set to 2 (Direct link).

Do you agree to the resolution provided in doc 11-22/0105r0 for the following CIDs?

10448, 12712, 12718, 12780, 13222