IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LB 275 CR for Misc CIDs | | | | |
| Date: 2023-10-01 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Duncan Ho | Qualcomm Technologies | 5665 Morehouse Drive, San Diego, CA 92131 | (858) 829-9509 | dho@qti.qualcmom.com |
| Abhishek Patil |  |  |
| Gaurang Naik |  |  |
| George Cherian |  |  |
| Alfred Asterjadhi |  |  |

Abstract

This submission proposes resolutions for following CIDs received for TGbe LB275:

**Revisions:**

* Rev 0: Initial version of the document.
* Rev 1: minor changes
* Rev 2: revised the proposed resolution of CID 19355
* Rev 3: minor editorial on the resolution of CID 19355

***TGbe editor: The baseline for this document is 11be D4.0***

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.***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Pg/Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 19355 | Brian Hart | 9.4.2.316 | 291.45 | 11be PAR section 5.5 explicitly reports "Users expect improved integration with Time Sensitive Networks (TSN) to support applications over heterogeneous Ethernet and Wireless LANs" and TSN is all about requesting gates (aka fixed-duration service periods) using time as the unit. However, the QoS Characteristics element carried in SCS frames, which is the vehicle for TSN upper layers to express their QoS needs to 802.11, provides no means for a STA to request a regular sequence of service periods of a fixed time. QoS Characteristics can express data rate and min/max SI, so we have a hokey time to data-rate+SI conversion (at client) then another, and likely different, conversion back to time (at AP). That's not what TSN users need. | Add a Min Service Period or similar field into the QoS Characteristics element or reuse the or reuse the Medium Time field for this purpose (e.g., delete sentence at P295L46). If required, further add a capability bit to indicate support for this new mode of operation. | **Revised**.  To support TSN, a very strict control of the medium and timing is needed. Therefore, the closest mechanism in 11be is r-TWT, which allows a STA to request for a specific medium time already.  However, we could add some clarification to the spec to explain the above.,  **TGbe Editor: please apply the changes related to CID 19355 shown in this CR.** |
| 19566 | Yonggang Fang | 9.4.2.316 | 291.48 | The QoS characteristics define the characteristics and QoS expectations of a traffic flow, which can be used by a non-AP MLD and AP MLD, in addition to "in the context of a particular non-AP EHT STA". | Suggest to change to "The QoS Characteristics element contains a set of parameters that define the characteristics and QoS expectations of a traffic flow through MAC-SAP. In the context of particular non-AP EHT STA, it is 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))" | **Rejected.**  The comment fails to identify a technical problem. The QoS Characteristics element is included in SCS Req/Resp, which applies at the MLD-level in the UL and DL cases (and link-level in the direct link case). |
| 20086 | Thomas Derham | 9.4.2.316 | 294.16 | Service Start Time field is defined as indicating the time "when the traffic starts...". However, in some cases the traffic stream might already have started before the STA makes the initial "Add" SCS request. In other cases, the STA might make a "Change" SCS request to modify parameters (including Service Start Time, to fix the "phase" of the SPs) for a stream that has already started. These scenarios must be accommodated in the definition. | Per comment | **Revised.**  Agreed in principle.  Added a note in the field description tagged by #20086 included in this CR.  **TGbe Editor: please apply the changes related to CID 20086 shown in this CR.** |
| 19634 | Duncan Ho | 9.4.2.316 | 292.20 | The bandwidth info is missing in the QoS characteristics element for the Medium Time computation for p2p | Specify the bandwidth info (e.g., see 11-23-0800-01-00be-lb271-9-4-2-316-qos-char-element-part-3 for more detailed proposal) so the proper medium time can be computed. | **Revised.**  Agree with the comment.  **TGbe Editor: please apply the changes related to CID 19634 shown in this CR.** |

==============================================================================

**To the editor: please modify section 9.4.2.316 as follows for CID20086:**

**9.4.2.316 QoS Characteristics element**

[….]

The Service Start Time field contains an unsigned integer that specifies the anticipated time, in microsec­onds, when the traffic starts for the associated TID. The Service Start Time indicates to the AP the time when the STA expects to exchange frames corresponding to the TID specified in this element. The field rep­resents the four lower order octets of the TSF timer corresponding to the link specified in the Service Start Time LinkID field at the start of the anticipated SP.

NOTE 3—For an UL traffic flow, the STA takes into account when it expects the UL traffic, if known (e.g., a burst of MSDUs from a codec has arrived), for an SP to be ready for transmission.

(#20086)NOTE 4—If the flow referred to by this element is already on-going upon the reception of this element, the Service Start Time indicates the first time when the STA expects to exchange frames corresponding to the TID specified in this element after the reception of this element.

===============================================================================

**To the editor: please modify section 9.4.2.316 as follows for CID19634:**

**9.4.2.316 QoS Characteristics element**

[…]

The QoS Characteristics element format is defined in Figure 9-1001au (QoS Characteristics element for[mat)](file:///C:\Users\dho\AppData\Local\Temp\6d97bcb8-3b3a-40f7-8d33-5d8ee66d567a_Draft%20P802.11be_D4.1%20-%20Word.zip.67a\Draft%20P802.11be_D4.1%20-%20Word\TGbe_Cl_09.docx#_bookmark257).

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

Octets: 1 1 1 4 4 4 3

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Delay Bound | Maximum MSDU  Size | Service Start Time | Service Start Time LinkID | Mean Data Rate | Delayed Bounded Burst Size | MSDU  Lifetime |

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

Medium Time Info

MSDU

Delivery Info

Octets: 0 or 1 0 or 2

**Figure 9-1001au—QoS Characteristics element format**

|  |  |  |  |
| --- | --- | --- | --- |
|  | B0 B11 | B12 B14 | B15 |
|  | Medium Time | Bandwidth | Reserved |
| Bits: | 12 | 3 | 1 |
| Figure 9-1002xx – Medium Time Info field format | | | |

The Medium Time Info field contains the medium time and bandwidth information and it contains the following subfields:

* The Medium Time field contains an unsigned integer that specifies the medium time, in units of 256 micro­seconds per second, 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. The values from 3,906 to 4,095 are reserved. The four MSB of the Medium Time field are reserved. The values 0, 3906 to 4095 are reserved. This field is present only if the Direction subfield is set to 2 (Direct link).
* The Bandwidth field specifies the maximum bandwidth the STA can operate for direct link transmissions on the link corresponding to the LinkID. This field is used to compute the medium time requested in the Medium Time field and this field is encoded as shown in Table 9-401s. 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..

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

[…]

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 and the AP should meet the medium time and bandwidth product requested if the Direction subfield of the QoS Characteristics element indicates direct link.

===============================================================================

**To the editor: please modify section 35.17 as follows for CID19355:**

**35.17 EHT SCS procedure**

**[…]**

An EHT STA that is an R-TWT scheduled STA (see 35.8 (Restricted TWT (R-TWT))) with a flow that requires a nominal minimal service duration may notify its associated AP of the flow both by requesting an R-TWT membership that contains the requested TWT Wake Duration for the flow and by sending an SCS Request frame with a QoS Characteristics element that contains both a Minimum Service Interval field and a Maximum Service Interval field for the flow, where the two requests indicate the same TID, the same flow direction (UL or DL), and the TWT wake interval is between the minimum service interval and the maximum service interval specified in the QoS Characteristics element.

If the EHT STA is an R-TWT scheduled STA (see 35.8 (Restricted TWT (R-TWT))) and either are negotiated R-TWT SPs for the TID specified in the QoS Characteristics element in the same direction (UL or DL) as indicated by the Direction subfield in the QoS Characteristics element, then the EHT AP should use these R-TWT SPs to serve traffic corresponding to the TID and specified direction in the QoS Characteristics element. If negotiated R-TWT SPs for the TID specified in the QoS Characteristics element are trigger-enabled R-TWT SPs, then the EHT AP should ensure that the Trigger frames are scheduled at the start of the R-TWT SPs.

Do you agree to the resolution provided in doc 11-23/1802r1 for the following CIDs?