IEEE P802.11
Wireless LANs

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| Resolution for CID 10674 |
| Date: 2022-07-10 |
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Abstract

This submission proposes resolution for 6 CIDs received in LB266 (11be D2.0).

10674, 10710, 12711, 13221, 11249, 12768

***TGbe editor: The baseline for this document is 11be D2.0***

**Revisions:**

* Rev 0: Initial version of the document.
* Rev 1: Added CIDs 10710, 12711, 13221 based on offline discussion and merged with the proposal in 11-22/1278r1
* Rev 2: Revised based on additional feedback

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** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 10674 | 9.4.2.316 | Currently, the standard lacks a fast way to convey dynamic QoS info (e.g., delay deadline of the HOL packet). Add a more dynamic mechanism for QoS reporting | Add a more dynamic mechanism for QoS reporting. Contribution to follow | **Revised**Agree in principle. We define a dynamic mechanism to allow the STA to report the head-of-line (HOL) packet delay information using the DSR Control field.TGbe editor, please implement changes as shown in 11-22/1454r1 tagged as 10674 |
| 10710 | 9.2.4.6.4 | Letancy sensitive traffic requires to be transmitted before it is expired. However, there is no legancy information in BSR for the latency sensitive traffic. AP may schedule trigger-based transmission wihtout considering the legacy requirement. AP may schedule the trigger transmission after the latency sensitive traffic expires. | add expiration time in BSR for latency sensitive traffic | **Revised**Agree in principle. Same resolution as 10674TGbe editor, please incorporate changes as shown in 11-22/1454r1 tagged 10674  |
| 12711 | 9.2.4.6.4 | QoS Characteristics element provides parameters that describe traffic characteristics (within the SCS procedure), especially the low latency (LL) parameters, so that AP shall be able to create an optimal schedule Unfortunatly, it is well known that such traffic is never well specified and does not inform the real amount of LL at a given time inside buffer's STA.An updated BSR shall be provided for Latency Sensitive data | An updated BSR Control shall inform the AP scheduler of an amount of data with regards to a timing indication, which provides the expected date for delivery (e.g. UL trigger). This greatly helps the AP scheduling UL RUs accordingly (date and size). | **Revised**Agree in principle. Same resolution as 10674TGbe editor, please incorporate changes as shown in 11-22/1454r1 tagged 10674 |
| 13221 | 9.4.2.316 | It is not clear, how a STA can indicate the current BSR with the delay budget of the head-of-line packet | Add the corresponding mechanism | **Revised**Agree in principle. Same resolution as 10674TGbe editor, please incorporate changes as shown in 11-22/1454r1 tagged 10674 |
| 11249 | 35.3.16.8.3 | If the AP receives such a request for assistance from multiple STAs, how does the AP know which STA to trigger first? If some STAs have packets that must be transmitted within a certain amount of time and if the STA is not assisted by the AP before this deadline, the STA may drop the packet and AP's help may not be useful. | Spec needs to define a method by which the STA can also indicate to the AP the time before which it must be triggered | **Revised**Agree in principle. Same resolution as 10674TGbe editor, please incorporate changes as shown in 11-22/1454r1 tagged 10674 |
| 12768 | 4.5.6.3 | The support for predictable latency is based on statistical approach (QoS characteristics) which is well adapted for periodic traffic. The standard should also consider the aperiodic low latency traffic (control command, almost expired time-to-live packets for high reliability traffic).  | Please consider signalling such as BSR to inform AP about instantaneous low latency needs. | **Revised**Agree in principle. Same resolution as 10674TGbe editor, please incorporate changes as shown in 11-22/1454r2 tagged 10674 |

### Proposed Text:

9.2.4.6 HT Control field

9.2.4.6.4 HE variant

***TGbe editor: Please make the following changes in Table 9-25 (Control ID subfield values) :***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|

|  |
| --- |
| Control ID value |

 |

|  |
| --- |
| Meaning |

 |

|  |
| --- |
| Length of the Control Information subfield (bits) |

 |

|  |
| --- |
| Content of the Control Information subfield |

 |
| … | … | … | … |
| 10 | Delay Status Report (DSR) (#10674) | 23 | See 9.2.4.7.11 (DSR Control) |
| 11-14 | Reserved |  |  |
| 15 |

|  |
| --- |
| Ones need expansion surely (ONES) |

 | 26 |

|  |
| --- |
| Set to all 1s |

 |

***TGbe editor: add the following subclause in subcaluse 9.2.4.7 (Control subfield variants of an A-Control subfield)***

9.2.4.7.11 DSR Control (CID 10674)

The Control Information subfield in a DSR Control subfield contains reported real-time delay information for frames queued for transmission by a STA in the uplink. The format of the subfield is shown in [Figure 9-w (Control Information subfield format in a DSR Control subfield)](#bookmark2)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | TID | Queue Size Scaling Factor | Low Latency Queue Size | TSF Time Encoding | HOL Packet Delay Type | HOL Packet Delay Feedback |
| Bits | 4 | 2 | 6 | 1 | 1 | 9 |

[Figure 9-w Control Information subfield format in a DSR Control subfield](#bookmark2)

The TID subfield indicates the TID whose delay is reported.

The Queue Size Scaling Factor subfield indicates the unit SF, in octets, of the Low Latency Queue Size subfield. The encoding of the Queue Size Scaling Factor subfield is shown in Table 9-y (Queue Size Scaling Factor subfield encoding).

The Low Latency Queue Size subfield indicates the amount of low latency buffered traffic, in units of SF octets, reported for the TID identified by the TID subfield to be delivered to the STA identified by the receiver address of the frame containing the DSR Control subfield. A queue size value of 62 in the Low Latency Queue Size subfield indicates that the amount of buffered traffic is greater than or equal 62 × SF octets. A queue size value of 63 in the Low Latency Queue Size subfield indicates that the amount of buffered traffic is unspecified.

Table 9-y —Queue Size Scaling Factor subfield encoding

|  |  |
| --- | --- |
| **Queue Size Scaling Factor subfield**  | **Scaling factor, SF (octets)** |
| 0 | 16 |
| 1 | 256 |
| 2 | 2048 |
| 3 | 32768 |

The TSF Time Encoding subfield indicates the encoding of the relevant TSF value for the HOL Packet Delay Feedback subfield. The TSF Time Encoding subfield is set according to Table 9-z (TSF Time Encoding subfield)

When the HOL Packet Delay Type subfield is set to 0, the HOL Packet Delay Feedback subfield specifies the relevant TSF value of the HOL packet enqueue time, in reference to the TSF time of the transmitting link, at which the STA has received the corresponding HOL packet of the indicated Queue Size subfield at the local MAC SAP. Otherwise, when the HOL Packet Delay Type subfield is set to 1, the HOL Packet Delay Feedback subfield specifies the relevant TSF value of the HOL packet expiration time, in reference to the TSF time of the transmitting link, at which the corresponding HOL packet of the indicated Queue Size subfield reaches its delay bound as indicated in the corresponding QoS Characteristics element. The lowest bit of the HOL Packet Delay Feedback subfield corresponds to the starting bit of the relevant TSF value. The starting bit is indicated by the TSF Time Encoding subfield (Bit S).

Table 9-z —TSF Time Encoding subfield

|  |  |
| --- | --- |
| **TSF Time Encoding subfield** | **Starting bit of the relevant TSF value (Bit S)** |
| 0 | 10 |
| 1 | Reserved |

***TGbe editor: Please modify the paragraphs in 9.4.2.313.2(EHT MAC Capabilities Information field) as follows (CID 10674):***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 | B3 | B4 |
|  | EPCS Priority Access Supported | EHT OM Control Support | Triggered TXOP Sharing Mode 1 Support | Triggered TXOP Sharing Mode 2 Support | Restricted TWT Support |
| Bits | 1 | 1 | 1 | 1 | 1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | B5 | B6 B7 | B8 | B9 | B10 |
|  | SCS Traffic Description Support | Maximum MPDU Length | Maximum A-MPDU Length Exponent Extension | EHT TRS Support | TXOP Return Support in TXOP Sharing Mode 2 |
| Bits | 1 | 2 | 1 | 1 | 1 |
|  |  |  |  |  |  |
|  | B11 | B12 B15 |  |  |  |
|  | Delay Status Report (DSR) Support | Reserved |  |  |  |
| Bits | 1 | 4 |  |  |  |
|  |  |  |  |  |  |

**Figure 9-1002ae—EHT MAC Capabilities Information field format**

The subfields of the EHT MAC Capabilities Information field are defined in Table 9-401k (Subfields of the EHT MAC Capabilities Information field).

**Table 9-401k—Subfields of the EHT MAC Capabilities Information field**

|  |  |  |
| --- | --- | --- |
| **Subfield** | **Definition** | **Encoding** |
| … | … | … |
| TXOP Return Sup-port In TXOP Shar-ing Mode 2 | Indicates support for receiving a frame with the RDG/More PPDU sub-field in the CAS Control subfield of the HE variant HT Control field from a non-AP STA in TXOP Sharing Mode 2 (see 35.2.1.2 (Triggered TXOP sharing procedure)). | For an EHT AP:Set to 1 to indicate that the AP is capable of receiving a QoS Data or QoS Null frame with the RDG/More PPDU subfield in the CAS Control subfield of the HE variant HT Control field from a non-AP STA in TXOP Sharing Mode 2. Set to 0 otherwise.For an non-AP EHT STA:Reserved. |
| Delay Status Report (DSR) Support | Indicates support for receiving or generating a frame with the DSR Control subfield of the HE variant HT Control field | For an EHT AP:Set to 1 to indicate that the AP is capable of receiving a QoS Data or QoS Null frame with the DSR Control subfield of the HE variant HT Control field from a non-AP EHT STA.Set to 0 otherwise.For a non-AP EHT STA:Set to 1 to indicate that the non-AP EHT STA is capable of generating a QoS Data or QoS Null frame with the DSR Control subfield of the HE variant HT Control field.Set to 0 otherwise. |

***TGbe editor: Please insert the following clause under 35.5.2 EHT UL MU operation as follows (CID 10674):***

**35.5.2.x Delay Status Report Operation**

A non-AP EHT STA may deliver delay status reports (DSRs) in addition to the BSR defined in 26.5.5 (Buffer status report operation) to assist its EHT AP in allocating UL MU resources.

An EHT STA shall set the Delay Status Report (DSR) Support subfield in the EHT Capabilities element it transmits to 1 if dot11EHTDSRControlImplemented is true; otherwise, the EHT STA shall set the Delay Status Report (DSR) Support subfield to 0.

A non-AP EHT STA with dot11EHTDSRControlImplemented set to true may deliver QoS Data or QoS Null frames with the the DSR Control subfield as defined in 9.2.4.7.11 (DSR Control) that are not carried in EHT TB PPDU or HE TB PPDU to its associated EHT AP if the AP has indicated its support in the Delay Status Report (DSR) Support subfield of its EHT Capabilities element; otherwise, a non-AP EHT STA shall not report the DSR in the DSR Control subfield.

After receiving the soliciting BSRP Trigger frame from an EHT AP that has the Delay Status Report (DSR) Support subfield of its EHT Capabilities element set to 1, a non-AP EHT STA with dot11EHTDSRControlImplemented equal to true may transmit a QoS Null frame with DSR Control subfield as defined in 9.2.4.7.11 (DSR Control).

When reporting the DSR, the non-AP EHT STA shall set the TID, Queue Size Scaling Factor, Low Latency Queue Size subfields as defined in 9.2.4.7.11 (DSR Control), and shall set the HOL Packet Delay Feedback subfield in the DSR Control subfield to TSF [Bit S:Bit S+8], where TSF corresponds to the HOL packet enqueue time when the HOL Packet Delay Type subfield is set to 0 or the HOL packet expiration time when the HOL Packet Delay Type subfield is set to 1. The TSF timer at which the HOL packet was enqueued or will expire, when the HOL Packet Delay Type subfield is set to 0 or 1, respectively, has bits 0 to S-1 equal to zero and bits S+9 to 63 equal to the same value as the respective bits in the current TSF timer. The non-AP EHT STA that reports DSR may set the Low Latency Queue Size subfield to be less than or equal to the total size of all the MSDUs and A-MSDUs buffered in the TID. The HOL Packet Delay Type subfield value of 1 shall only be used for the traffic of an established SCS stream with its EHT AP and which include a non-zero value in the Delay Bound field of the QoS Characteristics element with the Direction subfield set to 1 (Uplink) as defined in 35.3.22 (Multi-link SCS procedure) and 9.4.2.316 (QoS Characteristics element).