IEEE P802.11
Wireless LANs

|  |
| --- |
| CR BSR for RTA |
| Date: July 17, 2021 |
| Author(s): |
| Name | Affiliation | Address | Phone | email |
| Evgeny Khorov | IITP RAS |  |  | e@khorov.ru |
| Dmitry Bankov | IITP RAS |  |  |  |
| Ilya Levitsky | IITP RAS |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

 Abstract

This submission proposes resolutions for following CID received for TGbe CC36:

5022, 5271, 5362, 5022, 5874, 6525, 7432, 8063,

Revisions:

* Rev 0: Initial version of the document.

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 | Page | Line  | Proposed Change | Resolution | Resolution |
| 5022 | 9.2.4.6.3a | 71 | 20 | Add the ability to indicate delay constraints for RTA traffic in BSR | As in comment | Revised. Added a new format for the A-Control Subfield (a BSR variant) |
| 5271 | 35.3.6.2 | 298 | 22 | How can an EHT AP know the low latency traffic information of EHT non-AP STA? Like BSR, if trigger-enalbed, need to such a mechanism | As in the comment, we need to design how to know the low latency traffic information of EHT non-AP STA | Revised. Added a new format for the A-Control Subfield |
| 5362 | 9.2.4.6a | 99 | 12 | 11be has defined the Trigger TXOP TXS to grant a STA with an obtained TXOP, but the STA shall notify the duration or buffer length in advance to the AP. | BSR control frame is the best place to indicate the requested TXOP duration or the length of buffered traffic in granted TXOP case, but there is no reserved bit in BSR, we can consider to signaling these information in a new A-control frame. | Revised. Added a new format for the A-Control Subfield |
| 5874 | 35.6 | 297 | 57 | During the R-TWT SP, AP needs to reuqest BSR from the member STAs for arranging the transmssions for the latency sensitive traffic. However, the current BSR is not able to differentiate the buffer of latency sensitive traffic from other traffic | need a BSR variant to report the buffer of the latency sensitive traffic with necessary QoS parameters, such as expiration time. | Revised. Added a new format for the A-Control Subfield (a BSR variant) |
| 6525 | 9.2.4.6a.4 | 71 | 52 | There is plan to add TSPEC based signaling to provide 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 TSPEC 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. Added a new format for the A-Control Subfield (a BSR variant) |
| 7432 | 35.6.2.1 | 298 | 27 | AP cannot recognize the total transmitting amount of latency sensitive traffic although TSPEC can deliver the type of the traffic. For AP to assign the restricted TWT SP to Low Latency STA, we need a way to indicate the total amount from the STA to AP. By defining it (e.g., like BSR) for LLD, it would be helpuful to AP in allocating restricted TWT SP. | As in comment. | Revised. Added a new format for the A-Control Subfield (a BSR variant) |
| 8063 | 9.2.4.6.3a | 71 | 17 | BSR for low latency is missing. Need to define a new type of BSR to indicate low latency traffic. | as in comment | Revised. Added a new format for the A-Control Subfield (a BSR variant) |

***TGbe editor: Modify Table 9-22a as follows:***

|  |
| --- |
| Table 9-22a—Control ID subfield values |
| Control ID value | Meaning | Length of the Control Information subfield (bits) | Content of the Control Information subfield |
| 0 | Triggered response scheduling (TRS) | 26 | See 9.2.4.6a.1 (TRS Control) |
| 1 | Operating mode (OM) | 12 | See 9.2.4.6a.2 (OM Control) |
| 2 | HE link adaptation (HLA) | 26 | See 9.2.4.6a.3 (HLA Control) |
| 3 | Buffer status report (BSR) | 26 | See 9.2.4.6a.4 (BSR Control) |
| 4 | UL power headroom (UPH) | 8 | See 9.2.4.6a.5 (UPH Control) |
| 5 | Bandwidth query report (BQR) | 10 | See 9.2.4.6a.6 (BQR Control) |
| 6 | Command and status (CAS) | 8 | See 9.2.4.6a.7 (CAS Control) |
| 7 | EHT Operating Mode (EHT OM) | 6 | See 9.2.4.6a.8 (EHT OM Control) |
| 8 | Single response scheduling (SRS) | 10 | See 9.2.4.6a.9 (SRS Control) |
| 10 | AP assistance request (AAR) | 20 | See 9.2.4.6a.10 (AAR Control) |
| 11 | RTA Buffer status report (RTA BSR) | 26 | See 9.2.4.6a.x (RTA BSR Control) |
| 9,~~11~~12-14 | Reserved |  |  |
| 15 | Ones need expansion surely (ONES) | 26 | See 10.8 (HT Control field operation) |

***TGbe editor: Insert new subclause in 9.2.4.6a Control subfield variants of an A-Control subfield***

9.2.4.6a.x RTA BSR Control(#5022, #5271, #5362, #5022, #5874, #6525, #7432, #8063)

The Control Information subfield in an RTA BSR Control subfield contains buffer status information used for UL MU operation (see 26.5.2 (UL MU operation)) for delay-sensitive traffic. The format of the subfield is shown in Figure 9-22x (Control Information subfield format in an RTA BSR control subfield).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | B0 B2 | B3 B7 | B8 B9 | B10 B17 | B18 B25 |
|  | TID | Head-Of-Line Delay Budget | Scaling Factor | Head-Of-Line Batch Size | Queue Size |
| Bits: | 3 | 5 | 2 | 8 | 8 |

Figure 9-32x Control Information subfield format in an RTA BSR Control subfield

The TID subfield indicates the TID for which the STA is reporting the delay budget and buffer status.

The Head-Of-Line Delay Budget subfield indicates the remaining delay budget of the head-of-line MSDU or A-MSDU buffered at the STA, corresponding to the TID identified by the TID subfield, and intended for the STA identified by the receiver address of the frame containing the RTA BSR Control subfield, rounded down to the nearest number of TUs. A Head-Of-Line Delay Budget of 0 indicates that the delay budget is less than 1 TU. A Head-Of-Line Delay Budget of 31 indicates that the delay budget is greater than 30 TUs.

The Scaling Factor subfield indicates the unit SF, in octets, of the Queue Size subfield. The encoding of the Scaling Factor subfield is shown in Table 9-24f (Scaling Factor subfield encoding).

The Head-Of-Line Batch Size subfield indicates the amount of buffered traffic, in units of SF octets, for the head-of-line packet for the TID identified by the TID subfield that is intended for the STA identified by the receiver address of the frame containing the RTA BSR Control subfield.

The Queue Size subfield indicates the amount of buffered traffic, in units of SF octets, for the TID identified by the TID subfield that is intended for the STA identified by the receiver address of the frame containing the RTA BSR Control subfield.

The queue size value in the Queue Size subfield is the total size, rounded up to the nearest multiple of SF octets, of all MSDUs and A-MSDUs buffered at the STA (including the MSDUs or A-MSDUs in the same PSDU as the frame containing the RTA BSR Control subfield) in the delivery queues used for MSDUs and A-MSDUs with TID that is specified in the TID subfield.

NOTE 1—The queue size is based on data received by the STA at the MAC SAP (MA-UNITDATA.request). Any data in layers above the MAC is not taken into account.

NOTE 2—Buffered MSDUs are those that have been received in an MA-UNITDATA.request but that have not been successfully transmitted and have not been discarded.

A queue size value of 254 in the Queue Size subfield indicates that the amount of buffered traffic is greater than 254 × SF octets. A queue size value of 255 in the Queue Size subfield indicates that the amount of buffered traffic is an unspecified or unknown size.

The queue size value of the QoS Data frames containing the fragments might remain constant in all fragments even if the amount of queued traffic changes as successive fragments are transmitted (see 10.23.3.5.1 (General)). If the QoS Data frames containing fragments are carried in the A-MPDU, the queue size values of the MPDUs containing the fragments are set according to the rules in 10.18 (HT Control field operation).

***TGbe editor: Add one bit in 9.4.2.295c.2 EHT MAC Capabilities Information field as follows:***

***note to the TGbe editor that B0 and clause 9.4.2.295c.2 EHT MAC Capabilities Information field is proposed in 11-21-0253. For the bit number of RTA BSR Control Support, the number of the next available bit will be sufficient.***

|  |  |
| --- | --- |
|  |  |
|  | RTA BSR Control Support |
| Bits: | 1 |

Figure 9-xxx – EHT MAC Capabilities Information field format (#5022, #5271, #5362, #5022, #5874, #6525, #7432, #8063)

***TGbe editor: Add one row in Table 9-xxxa Subfields of the EHT MAC Capabilities Information field as follows:***

***note to the TGbe editor that 9.4.2.295c.2 EHT MAC Capabilities Information field is proposed in 11-21-0253.***

|  |
| --- |
| Table 9-xxxa Subfields of the EHT MAC Capabilities Information field |
| Subfield | Definition | Encoding |
| RTA BSR Control Support | Indicates support for receiving a frame with an RTA BSR Control subfield. | Set to 1 if the STA supports RTA BSR Control subfield functionality.Set to 0 otherwise.(#5022, #5271, #5362, #5022, #5874, #6525, #7432, #8063) |

**Straw Poll: Do you support to incorporate the proposed draft text in this document 11-21/TODO to the next revision of TGbe Draft?**

**Result: Yes/No/Abstain**