IEEE P802.11
Wireless LANs

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| CR for CID 14324, 12310 |
| Date: 2018-02-27 |
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Abstract

This submission proposes resolutions for multiple comments related to TGax D2.2 with the following CIDs:

* 14324, 12310

Revisions:

* Rev 0: Initial version.
* Rev 2: Reflected comment from Liwen.

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

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

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **clause** | **Comment** | **Proposed Change** | **Resolution** |
| 14324 | Zhou Lan | 27.5.3.6 | The Queue size High and Queue Size All in the BSR Control is poorly designed. It doesn't provide sufficient information of UL OFDMA/MIMO scheduling. Need a better design. | as in the comment | Revised –Aggree in principle. Refer to IEEE 802.11-17/1132r0 for discussionsTGax editor to make the changes shown in 11-18/55r0 |
| 12310 | Laurent Cariou | 9.2.4.6.4.5 | There has been several attemps to harmonize QoS-control BSR with A-control BSR that failed. Because of this, A-control BSR does not provide benefits and should be removed from the spec. | Harmonize A-control with QoS control BSR, or remove A-control BSR from the spec. | Revised –Aggree in principle. Refer to IEEE 802.11-17/1132r0 for discussionsTGax editor to make the changes shown in 11-18/55r0 |

## Discussion:

Refer to the discussion in doc IEEE 802.11-17/1132r0. This contribution provides spec text replacing per AC based queue size report with per TID based queue size report.

SP#1: Do you agree to harmonize A-control with QoS control BSR by replacing per AC queue size report in A-Control with per TID queue size report?

SP#2: Do you agree to accept resolutions to CIDs 14324, 12310 in doc 11-18/0055r2?

9.2.4.6.4.5 Buffer status report (BSR) Control

**TGax Editor: *replace the exiting text and tables in section of 9.2.4.6.4.5 with the text and tables as follows:***

The Control Information subfield, when the Control ID subfield is 3, contains buffer status information used for UL MU operation (see 27.5.2.5 (HE buffer status feedback operation for UL MU)). The format of the subfield is shown in Figure 9-15f (Control Information subfield format when Control ID subfield is 3).

|  |  |  |  |
| --- | --- | --- | --- |
|  | B0 B3 | B4 B9 | B10 B11 |
|  | TID | Queue size |  Scaling factor |
| Bits: | 4 | 6 | 2 |

**Figure 9-15f—Control Information subfield format when Control ID subfield is 3**

The TID subfield indicates the TID for which the following Queue Size of the TID subfield is present.

The Queue Size subfield containing an unscaled value, UV indicates the amount of buffered traffic in units of SF octets of the TID identified by the TID subfield that is intended for the STA identified by the receive address of the frame containing the BSR Control field.

The Scaling Factor subfield indicates the unit SF, in octets, of the Queue Size subfields. The encoding of the Scaling Factor subfield is shown in Table 9-18e (Scaling Factor subfield encoding).

**Table 9-18e-Scaling Facor subfield encoding**

|  |  |
| --- | --- |
| **Scaling Factor subfield** | **Scaling factor, *SF,* in octets** |
| 0 | 16 |
| 1 | 256 |
| 2 | 2048 |
| 3 | 32768 |

The Queue Size value for a non-AP HE STA transmitting the BSR Control subfield to an HE AP is calculated as follows:

$$Queue Size= \left\{\begin{array}{c}16 UV, if the Scaling Factor subfield is 0\\ 1024+256 UV, if the Scaling Factor subfield is 1\\ 17 408+2048 UV, if the Scaling Factor subfield is 2 \\148 480+32 768 UV, if the Scaling Factor subfield is 3 \\\end{array}\right.$$

27.5.3.6 HE buffer status feedback operation for UL MU

**TGax Editor: *modify section 27.5.3.6 as follows:***

A non-AP STA delivers buffer status reports (BSRs) to assist its AP in allocating UL MU resources. The non-AP STA can either implicitly deliver BSRs in the QoS Control field or BSR Control subfield(#14137) of any frame transmitted to the AP (unsolicited BSR) or explicitly deliver BSRs in any frame sent to the AP in response to a BSRP Trigger frame (solicited BSR).

A non-AP STA reports its buffer status (unsolicited BSR) to the AP to which it is associated using either the QoS Control field or the BSR Control subfield(#14137) of frames it transmits as defined below:

* The HE STA shall report the buffer status for a given TID in the Queue Size subfield of the QoS Control field in QoS Data or QoS Null frames it transmits; except that the STA may set the Queue Size subfield to 255 to indicate an unknown/unspecified BSR for that TID. The HE STA may report the buffer status for a given TID in the Queue Size subfield of the BSR Control field if the AP has indicated its support in the BSR Support subfield of its HE Capabilities element; otherwise the STA shall not report the buffer status in the BSR Control field.
	+ The HE STA may aggregate multiple QoS Data frames or QoS Null frames in an A-MPDU to report the buffer status for different TIDs. The HE STA shall follow the A-MPDU aggregation rules defined in 27.10.4 (Multi-TID A-MPDU and ack-enabled A-MPDU) for aggregating QoS Data frames with multiple TIDs. The HE STA does not follow the rules defined in 27.10.4 (Multi-TID A-MPDU and ack-enabled A-MPDU) for QoS Null frames whose Ack Policy subfield is No Ack.
* ~~The HE STA may report the buffer status in the BSR Control subfield(#14137) of frames it transmits if the AP has indicated its support in the BSR Support subfield of its HE Capabilities element; otherwise the STA shall not report the buffer status in the BSR Control subfield(#14137).~~
	+ ~~The HE STA shall report the buffer status for its preferred AC, indicated by the ACI High subfield, in the Queue Size High subfield of the BSR Control subfield(#14137); except that the STA may set the Queue Size High subfield to 255 to indicate an unknown/unspecified BSR for that AC.~~
	+ ~~The HE STA shall report the buffer status for all ACs, indicated by the ACI Bitmap subfield, in the Queue Size All subfield of the BSR Control subfield(#14137); except that the STA may set the Queue Size All subfield to 255 to indicate an unknown/unspecified BSR for those ACs.~~
	+ ~~The HE STA shall set the Delta TID subfield according to Table 9-18d (Delta TID subfield encoding), and the Scaling Factor subfield as defined in 9.2.4.6a.4 (BSR Control).~~

NOTE 1—The STA can send an unsolicited BSR in response certain Trigger frames except MU-RTS and BSRP (with or without RA-RUs(#11033), as defined in 27.5.3.3 (STA behavior for UL MU operation) and in 27.5.5 (UL OFDMAbased random access (UORA))) or it can send the unsolicited BSR after accessing the WM using EDCA.

NOTE 2—The STA can include both the QoS Control and the BSR Control subfield(#14137) in the same frame. In this case it can set the Queue Size subfield of either field to a value of 255 or have both fields carry the same value in the Queue Size subfield.

An AP can also solicit one or more associated non-AP STAs for their BSR(s) by sending a BSRP Trigger frame (see 9.3.1.23 (Trigger frame format)). The non-AP STA responds (solicited BSR) as defined below:

* The STA that receives a BSRP Trigger frame shall follow the rules defined in 27.5.3.3 (STA behavior for UL MU operation) to generate the HE TB PPDU when the Trigger frame contains the 12 LSBs of the STA's AID in any of the User Info fields; otherwise if the STA's buffers are not empty and the STA supports the UL OFDMA-based random access procedure, it may follow the rules defined in 27.5.5 (UL OFDMA-based random access (UORA)) to gain access to an RARU(# 11033) and generate the HE TB PPDU when the Trigger frame contains one or more RARUs(# 11033).
* The STA shall include in the HE TB PPDU one or more QoS Null frames containing one or more of the following:
	+ The QoS Control field(s) with Queue Size subfields for each of the TIDs for which the STA has buffer status to report to the AP.
	+ The BSR Control subfield(#14137) with the ~~Queue Size All subfield~~ Queue Size subfield indicating the queue size for ~~all the ACs~~the TIDs, indicated by the ACI Bitmap subfield, for which the STA has buffer status to report to the AP when the AP has indicated its support in the BSR Support subfield of its HE Capabilities element. ~~The STA shall set Delta TID, SF, ACI High and Queue Size High subfields of the BSR Control subfield(#14137) as defined in 9.2.4.6a.4 (BSR Control).~~
* The HE STA shall not solicit an immediate response for the frames carried in the HE TB PPDU (e.g., by setting the Ack Policy subfield of the frame to Normal Ack or Implicit Block Ack Request).

NOTE 1—Similar to unsolicited BSR, a STA can include both the QoS Control field and the BSR Control subfield in the same QoS Null frame in response to the BSRP Trigger frame. In this case, the STA can set the Queue Size subfield of either subfield to a value of 255 or have both subfields carry the same value in the Queue Size subfield.(#11323)

NOTE 2—Similar to unsolicited BSR, a STA can set the Queue Sizes in either the QoS Control field or the BSR Control subfield(#14137) or both to 255 to indicate unknown/unspecified BSR or to some other value(#11325) for a TID, AC or all AC.

NOTE 3—An AP does not send a BSRP Trigger frame containing the 12 LSBs of the AID of the STA that sets the UL MU Disable field to 1.(#11324, #Ed)

For both solicited and unsolicited BSR, the STA should include a UPH Control subfield as defined in section 9.2.4.6.4.6 in the A Control field that contains the BSR Control subfield.

An AP may include a BSRP Trigger frame together with other Control, Data and Management frames in one A-MPDU to a STA if the HE Capabilities element received from the STA has the BSRP BQRP A-MPDU Aggregation field(#12145) equal to 1. If a STA receives a BSRP Trigger frame aggregated with Control, Data and Management frames that solicits an acknowledgment(#11208), the response A-MPDU shall contain MPDUs in the order described in Table 9-428 (A-MPDU contents MPDUs in the control response context(# 13283))(#13921).

The NDP feedback report procedure described in 27.5.6 (NDP feedback report procedure) can be used for buffer status feedback operation. An AP that sent an NFRP Trigger frame to one or more STAs may send a BSRP Trigger frame to those STAs to get more precise buffer status information.(#12314)