IEEE P802.11
Wireless LANs

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| Comment resolutions for BSR operation |
| Date: 2019-03-01 |
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Abstract

This submission proposes resolutions for multiple comments related to TGax D4.0 with the following CIDs (5 CIDs):

* 20495, 20530, 21343, 21344, 21345

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Deferred two CIDs (21346, 21347). Incorporated suggestion received from Robert offline (changes in green).

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.***

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| **CID** | **Commenter** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 20495 | Mark RISON | 341.14 | "NOTE 1---Similar to unsolicited BSR, a non-AP STA can include both the QoS Control field and the BSR Control sub-field in the same QoS Null frame in response to the BSRP Trigger frame. The non-AP STA can set the Queue Sizes ineither the QoS Control field or the BSR Control subfield or both to 255 or other value to indicate unknown/unspecifiedBSR or to some other value.NOTE 2---If both a QoS Control field and a BSR Control field are present in a frame, the Queue Size subfield in eachmight be different." is confusing (in addition to having various editorial issues) | Replace the two cited NOTEs with a single "NOTE 1---For both unsolicited and solicited BSR, a non-AP STA might include a BSR Control field in a QoS Data or QoS Null frame. In this case, the Queue Size subfields in the QoS Control field and the BSR Control field might differ, and either or both might be 255 to indicate unspecified or unknown." and renumber NOTE 3 to NOTE 2 | Revised –Agree in principle with the comment. Please note that the case of the unsolicited BSR is already covered in Note 2 of the preceding paragraph. This note is related to the solicited BSR which are carried only in QoS Null frames. In order to keep consistency in terms of carriers the proposed resolution fixes the notes (of the preceding paragraph for the unsolicited BSR) and this note as suggested by the commenter).TGax editor to make the changes shown in 11-19/0316r1 under all headings that include CID 20495. |
| 20530 | Mark RISON | 340.36 | "The HE STA shall report the buffer status for all ACs, indicated by the ACI Bitmap subfield," is confusing: it's not (necessarily) reporting the status for all ACs | Change the cited text at the referenced location to "The HE STA shall report the buffer status of the ACs indicated by the ACI Bitmap subfield" | Revised –Agree in principle with the comment. Applying the change of removing “all” in two instances (unsolicited and solicited).TGax editor to make the changes shown in 11-19/0316r1 under all headings that include CID 20530. |
| 21343 | Robert Stacey | 341.14 | The QoS Control field is always present so the non-AP STA has no choice but to include it. | Change sentence to "As with unsolicited BSR, a non-AP STA might include a BSR Control subfield in a QoS Null frame that is sent in response to a BSRP Trigger frame" | Revised –Agree with the comment that QoS Control field is always present in QoS Null frame. Proposed resolution accounts for the suggested change. It also fixes a bug in the preceding bullet that mentions QoS Data replacing it with QoS Null in the case of solicited BSR.TGax editor to make the changes shown in 11-19/0316r1 under all headings that include CID 21343. |
| 21344 | Robert Stacey | 341.18 | The QoS Control field is always present. | If the BSR Control subfield is present, the Queue Size field of the BSR Control subfield might indicate a different queue size from that indicated by the Queue Size field in the QoS Control field. | Revised –This note is covering the “frame” in general, and in this case the frame can be an Action No Ack frame which does not contain a QoS Control field but might contain the BSR Control field. However, the proposed resolution is removing this note as it is being merged with the preceding note.TGax editor to make the changes shown in 11-19/0316r1 under all headings that include CID 21344. |
| 21345 | Robert Stacey | 340.46 | The QoS Control field is always present. | Change to "If a QoS Null frame or QoS Data frame includes a BSR Control subfield, then..." | Revised –The QoS Control field is always present if the frame is a QoS Null or QoS Data frame but is not present in Management frames (while BSR Control can be present). Proposed resolution is to clearly separate these two cases. TGax editor to make the changes shown in 11-19/0316r1 under all headings that include CID 21345. |
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**Discussion: *None.***

* HE buffer status feedback operation for UL MU

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 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).

An HE STA shall set the BSR Support subfield of the HE Capabilities element it transmits to 1 if dot11HEBSRControlImplemented is true; otherwise the HE STA shall set the BSR Support subfield to 0.

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 20530):***

A non-AP STA reports its buffer status (unsolicited BSR) to the AP to which it is associated in the QoS Control field in QoS Null and QoS Data frames and in the BSR Control subfield (if present) in QoS Null, QoS Data and Management frames 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; (#15346)the STA may set the Queue Size subfield to 255 to indicate an unknown/unspecified BSR for that TID.
* 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 26.6.4 (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 26.6.4 (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 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.
* 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; (#15347)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 the ACs, indicated by the ACI Bitmap subfield, in the Queue Size All subfield of the BSR Control subfield; (#15348)the STA may set the Queue Size All subfield to 255 to indicate an unknown/unspecified BSR for those ACs.*(#20530)*
* The HE STA shall set the Delta TID subfield according to Table 9-24d (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 to(#16954) certain Trigger frames except MU-RTS and BSRP (with or without RA-RUs, as defined in 26.5.3.3 (Non-AP STA behavior for UL MU operation) and in 26.5.5 (UL OFDMA-based random access (UORA))) or it can send the unsolicited BSR after accessing the WM using EDCA.

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 20495, 21345):***

NOTE 2—The STA might include a BSR Control subfield in a QoS Data or QoS Null frame. In this case the Queue Size subfields in the QoS Control field and the BSR Control subfield might differ, andeither or both might be 255 to indicate unspecified or unknown buffer status report. The STA might include only the BSR Control subfield in a Management frame.*(#20495, 21345)*

**TGax Editor: *Change the paragraph below of this subclause as follows (#CID 20530, 21343):***

An AP can also solicit one or more associated non-AP STAs for their BSR(s) by sending a BSRP Trigger frame (see 9.3.1.22.6 (Buffer Status Report Poll (BSRP) variant)(#15076)). The non-AP STA responds (solicited BSR) as defined below:

* The non-AP STA(#16592) that receives a BSRP Trigger frame shall follow the rules defined in 26.5.3.3 (Non-AP STA behavior for UL MU operation) to generate the HE TB PPDU if(#15349) the Trigger frame contains the 12 LSBs of the non-AP STA’s(#16592) AID in any of the User Info fields; otherwise if the non-AP STA’s(#16592) buffers are not empty and the non-AP STA(#16592) supports the UL OFDMA-based random access procedure, it may follow the rules defined in 26.5.5 (UL OFDMA-based random access (UORA)) to gain access to an RA-RU and generate the HE TB PPDU when the Trigger frame contains one or more RA-RUs.
* The non-AP STA(#16592) 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 non-AP STA(#16592) has buffer status to report to the AP.
* The BSR Control subfield with the Queue Size All subfield indicating the queue size for the ACs, indicated by the ACI Bitmap subfield, for which the non-AP STA(#16592) has buffer status to report to the AP if(#15350) the AP has indicated its support in the BSR Support subfield of its HE Capabilities element. The non-AP STA(#16592) shall set Delta TID, SF, ACI High and Queue Size High subfields of the BSR Control subfield as defined in 9.2.4.6a.4 (BSR Control).*(#20530)*
* The non-AP STA(#16592) shall not solicit an immediate response for the frames carried in the HE TB PPDU (e.g., the Ack Policy subfield of a QoS Null frame shall not be set to Normal Ack or Implicit Block Ack Request).(#15952)*(#21343)*

**TGax Editor: *Change the paragraphs below of this subclause as follows (#CID 20495, 21343, 21344):***

NOTE 1—As with unsolicited BSRthe STA(#16592) might include a BSR Control subfield in a QoS Null frame that is sent in response to the BSRP Trigger frame. In this case the (#16592) the Queue Size subfields in the QoS Control field and the BSR Control subfield might differ, and either or both might be 255 to indicate unspecified or unknown buffer status report.*(#21343, 21344)* (#15090)

NOTE 2—An AP does not send a BSRP Trigger frame containing the 12 LSBs of the AID of the non-AP STA(#16592) that sets the UL MU Disable field to 1.*(#20495)*

An AP may include a BSRP Trigger frame together with other Control, Data and Management frames in one A-MPDU to a non-AP STA(#16592) if the HE Capabilities element received from the non-AP STA(#16592) has the BSRP BQRP A-MPDU Aggregation field equal to 1. If a non-AP STA(#16592) receives a BSRP Trigger frame aggregated with Control, Data and Management frames that solicits an acknowledgment, the response A-MPDU shall contain MPDUs in the order described in Table 9-531 (A-MPDU contents MPDUs in the control response context).

The NDP feedback report procedure described in 26.5.6 (NDP feedback report procedure) can be used for buffer status feedback operation. An AP that sent an NFRP Trigger frame to one or more non-AP STAs(#16592) may send a BSRP Trigger frame to those non-AP STAs(#16592) to get more precise buffer status information.