IEEE P802.11  
Wireless LANs

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | CR of BQR (on D2.0) | | | | | | Date: 2018-1-1 | | | | | | Author(s): | | | | | | Name | Affiliation | Address | Phone | Email | | Zhou Lan | Broadcom Ltd. | 250 Innovation Drive San Jose CA 95134 | (+1) 408 543 3450 | [zhou.lan@broadcom.com](mailto:zhou.lan@broadcom.com) | | Chunyu Hu | Broadcom Ltd. | 250 Innovation Drive San Jose CA 95134 |  | [chunyu.hu@broadcom.com](mailto:chunyu.hu@broadcom.com) | | Matthew Fischer | Broadcom Ltd. | 250 Innovation Drive San Jose CA 95134 |  | [matthew.fischer@broadcom.com](mailto:matthew.fischer@broadcom.com) | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |

Abstract

Comment resolution with proposed changes to TGax D2.0 for CIDs from the WG LB for TGax related to BQR.

The CID list is:

11508, 13910, 12492, 11303, 11304, 13911, 12493, 11305, 11306, 11307, 11308, 13827, 12494, 12495, 12496, 13093, 11326.

The proposed changes on this document are based on TGax Draft 2.0.

**REVISION NOTES:**

R0: Initial draft with comments from group.

**END OF REVISION NOTES**

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.***

**CIDs**

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| --- | --- | --- | --- | --- | --- | --- |
| 11508 | Chunyu Hu | 263.08 | 27.6.1 | "As with the VHT sounding protocol," doesn't provide much technical vlaue here. Clarify otherwise remove it. | as in the comment | Revised-  Agree in principle.  TGax editor makes changes as shown in 11-18/053r0 that are marked with CID 11508  Transfer to sounding owner |
| 13910 | Yongho Seok | 243.04 | 27.5.2 | "A STA may send bandwidth query reports (BQRs) when the peer STA has indicated support by setting the BQR Support field in the HE Capabilities element it transmits to 1; otherwise the STA shall not send BQRs to the peer STA." Because this sentence is not applied to an AP STA, change "A STA" to "A non-AP STA". Or, remove the cited paragraph because it is covered by 6th paragraph. | Change as the following: "An HE non-AP STA may send bandwidth query reports (BQRs) when its associated AP STA has indicated support by setting the BQR Support field in the HE Capabilities element it transmits to 1; otherwise the HE non-AP STA shall not send BQRs to its associated AP STA." Or remove the cited paragraph. | Revised-  The first paragraph describes the generable capability requirement so that in the following paragraphs don’t have to repeat the same capability requirement.  TGax editor makes no changes on CID 13910. |
| 12492 | Liwen Chu | 243.10 | 27.5.2 | Wrong subfield name | Fix the issue mentioned in comment. | Revised-  Agree in principle  TGax editor makes changes as shown in 11-18/053r0 that are marked with CID 12492 |
| 11303 | Alfred Asterjadhi | 243.11 | 27.5.2 | Typo: It is BQR Support. Replace BQRP Support with BQR Support. | As in comment. | Revised-  Agree in principle  TGax editor makes changes as shown in 11-18/053r0 that are marked with CID 11303 |
| 11304 | Alfred Asterjadhi | 243.14 | 27.5.2 | Some duplicate contents here. Remove the first paragraph of this subclause. Remove the first sentence in L14 and have the item as an independent sentence, where "the HE STA" is replaced with "A non-AP STA, and add (unsolicited)" after information. | As in comment. | Revised-  Agree in principle  TGax editor makes changes as shown in 11-18/053r0 that are marked with CID 11304 |
| 13911 | Yongho Seok | 243.14 | 27.5.2 | "A non-AP STA reports its channel availability information (unsolicited BQR) to the AP to which it is associated using the BQR Control field of frames it transmits as defined below: -- The HE STA may report the channel availability information in the BQR Control field of frames it transmits if the AP has indicated its support in the BQR Support subfield of its HE Capabilities element; otherwise the STA shall not report the channel availability information in the BQR Control field." Remove the cited paragraph because it is almost same with 6th paragraph. | Remove the cited paragraph. | Revised-  Agree in principle  TGax editor makes changes as shown in 11-18/053r0 that are marked with CID 13911 |
| 12493 | Liwen Chu | 243.17 | 27.5.2 | Dulicate with 1st paragraph. Remove one of them | As in comment | Revised-  Agree in principle  TGax editor makes changes as shown in 11-18/053r0 that are marked with CID 12493 |
| 11305 | Alfred Asterjadhi | 243.27 | 27.5.2 | I suggest putting this sentence as the first sentence of the subclause as it described both options. Suggest though to have it with can instead of may (declarative) and add a classifier "provided that the AP supports reception of BQRs. | As in comment. | Revised-  Agree in principle  TGax editor makes changes as shown in 11-18/053r0 that are marked with CID 11305 |
| 11306 | Alfred Asterjadhi | 243.34 | 27.5.2 | Duplicate paragraph. Delete. | As in comment. | Revised-  Agree in principle  TGax editor makes changes as shown in 11-18/053r0 that are marked with CID 11306 |
| 11307 | Alfred Asterjadhi | 243.43 | 27.5.2 | Solicit what? Suggest saying "may solicit BQRs from one or more" | As in comment. | Revised-  Agree in principle  TGax editor makes changes as shown in 11-18/053r0 that are marked with CID 11307 |
| 11308 | Alfred Asterjadhi | 243.54 | 27.5.2 | Say (in the text in parenthesis) instead that it will set the Ack Policy to No Ack for the frames it carries in the HE TB PPDU. | As in comment. | Revised-  Agree in principle  TGax editor makes changes as shown in 11-18/053r0 that are marked with CID 11308 |
| 13827 | Yasuhiko Inoue | 243.27 | 27.5.2 | "A STA may send BQRs to an AP to assist DL MU and UL MU resource allocation in an efficient way."  This text is ambiguous compared to the other sentence in this subclause. | Improve the text, e.g., "A non-AP HE STA may send BQRs to the AP with which it is associated to assist DL MU and UL MU resource allocation in an efficient way." | Revised-  Agree in principle  TGax editor makes changes as shown in 11-18/053r0 that are marked with CID 13827 |
| 12494 | Liwen Chu | 243.30 | 27.5.2 | BQR can't be in any frame. | Change to in QoS Data, QoS Null, Management frame. | Revised-  Agree in principle  TGax editor makes changes as shown in 11-18/053r0 that are marked with CID 12494 |
| 12495 | Liwen Chu | 243.33 | 27.5.2 | Duplicate with L14. Remove one of them | As in comment | Revised-  Agree in principle  TGax editor makes changes as shown in 11-18/053r0 that are marked with CID 12495 |
| ~~12496~~ | ~~Liwen Chu~~ | ~~243.52~~ | ~~27.5.2~~ | ~~Add the following text at the end of the sentence: and the STA wants to report the channel available information~~ | ~~As in comment~~ | ~~Revised-~~  ~~Agree in principle~~  ~~TGax editor makes changes as shown in 11-18/053r0 that are marked with CID 12496~~ |
| ~~13093~~ | ~~Patrice Nezou~~ | ~~243.47~~ | ~~27.5.2~~ | ~~"The STA that receives a BQRP 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 STA's AID in any of the Per User Info fields; otherwise the STA shall follow the rules defined in 27.5.5 (UL OFDMA-based random access (UORA)) to gain access to a random access RU and generate the HE TB PPDU when the Trigger frame contains one or more random access RUs."  If the STA's AID equals to 0 only, the STA shall follow the rules defined in 27.5.5.~~ | ~~It is not possible to to set a RU with AID other than an associated STAs' AID or AID = 0. For instance, a RU with AID= 2045 must be forbidden in a BQRP Trigger frame. Please add a note to precise this condition.~~ | ~~Rejected-~~  ~~There is no reason to forbid a unassociated STA to report BQR.~~  ~~TGax editor makes no changes on CID 13093.~~ |
| 11326 | Alfred Asterjadhi | 243.54 | 27.5.2 | Too generic to say MPDUs. Explicitly call out what the MPDUs are. | Replace "MPDUs" with "QoS Data or QoS Null frames" and and replace the other MPDUs with frames. | Revised-  Agree in principle  TGax editor makes changes as shown in 11-18/053r0 that are marked with CID 11326 |

**Discussion:**

Clarifying the language as suggested.

**Proposed Changes to Draft Text of TGax D2.0:**

TGax editor: change section 27.6.1 as follows

**27.6.1 General**

Transmit beamforming and DL MU-MIMO require knowledge of the channel state to compute a steering matrix that is applied to the transmit signal to optimize reception at one or more receivers. HE STAs use the HE sounding protocol to determine the channel state information. (#CID 11508)~~As with the VHT sounding protocol,~~ ~~t~~The HE sounding protocol uses explicit feedback mechanism where the HE beamformee measures the channel using a training signal transmitted by the HE beamformer and sends back a transformed estimate of the channel state. The HE beamformer uses this estimate to derive the steering matrix.

The HE beamformee returns an estimate of the channel state in an HE compressed beamforming feedback. The HE compressed beamforming feedback is an HE Compressed Beamforming Report field for SU-type feedback, the concatenation of an HE Compressed Beamforming Report field and HE MU Exclusive Beamforming Report field for MU-type feedback, and a CQI-only Report field for CQI-type feedback. The HE compressed beamforming feedback is carried in a single HE Compressed Beamforming And CQI Report frame if the resulting frame is less than or equal to 11 454 octets in length. Otherwise, the HE beamforming feedback is segmented and each segment is carried in an HE Compressed Beamforming And CQI Report frame. For CQI-type feedback the HE compressed beamforming feedback is never segmented since the resulting MPDU size will always be less than 11 454 octets.

TGax editor: change section 27.5.2 as follows

**27.5.2 HE bandwidth query report operation for MU**

(#CID 11303, 11304, 13911, 12492, 12493, 11305, 11306, 12495)

~~A STA may send bandwidth query reports (BQRs) when the peer STA has indicated support by setting the BQR Support field in the HE Capabilities element it transmits to 1; otherwise the STA shall not send BQRs to the peer STA.~~

~~An AP may solicit BQRs from a non-AP STA with a BQRP Trigger frame if the non-AP STA has indicated support by setting the BQRP Support field in the HE Capabilities eement it transmits to 1; otherwise the AP shall not solicit BQRs from the non-AP STA.~~

~~A non-AP STA reports its channel availability information (unsolicited BQR) to the AP to which it is associated using the BQR Control field of frames it transmits as defined below:~~

* ~~The HE STA may report the channel availability information in the BQR Control field of frames it transmits if the AP has indicated its support in the BQR Support subfield of its HE Capabilities element;~~

~~NOTE—The STA can send an unsolicited BQR in response to certain Trigger frames except MU-RTS and BQRP (with or without random access RUs, as defined in 27.5.3.3 (STA behaviour for UL MU operation) and in 27.5.5 (UL OFDMA based random access (UORA))) or it can send the unsolicited BQR after accessing the WM using EDCA.~~

A non-AP (#CID 13827)STA may send BQRs to an AP to assist DL MU and UL MU resource allocation in an efficient way. The non-AP STA may either implicitly deliver BQRs in the BQR Control field of a frame transmitted to the AP (unsolicited BQR) or explicitly deliver BQRs in ~~any~~ (#CID 12494) a frame sent to the AP in response to a BQRP Trigger frame (solicited BQR).

A non-AP STA reports its channel availability information (unsolicited BQR) to the AP to which it is associated using the BQR Control field of frames it transmits as defined below:

* The HE STA may report the channel availability information as specified in 28.3.19.6.5 (Per 20 MHz CCA sensitivity) in the BQR Control field of frames it transmits if the AP has indicated its support in the BQR Support subfield of its HE Capabilities element; otherwise the STA shall not report the channel availability information in the BQR Control field.

NOTE—The STA can send an unsolicited BQR in response to certain Trigger frames except MU-RTS and BQRP (with or without random access RUs, as defined in 27.5.3.3 (STA behaviour for UL MU operation) and in 27.5.5 (UL OFDMA based random access (UORA))) or it can send the unsolicited BQR after accessing the WM using EDCA.

An HE AP may solicit BQRs from (#CID 11307)one or more non-AP HE STAs that support generating BQRs, by sending a BQRP Trigger frame (see 9.3.1.23 (Trigger frame format)). A non-AP STA that supports generating a BQR responds (solicited BQR) as defined below:

* An AP may solicit BQRs from a non-AP STA only if the non-AP STA has indicated support by setting the BQR Support field in the HE Capabilities element it transmits to 1; otherwise the AP shall not solicit BQRs from the non-AP STA.
* The STA that receives a BQRP 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 STA's AID in any of the Per User Info fields; otherwise the STA shall follow the rules defined in 27.5.5 (UL OFDMA-based random access (UORA)) to gain access to a random access RU and generate the HE TB PPDU when the Trigger frame contains one or more random access RUs when the STA wants to report its channel availability information (#CID 12496).
* The STA shall include in the HE TB PPDU one or more (#CID 12494) (#CID 12494, 11326)QoS Null or Action No Ack frames containing the BQR Control field with the channel availability information of the STA. The HE STA shall not solicit an immediate response for the frames carried in the HE TB PPDU (~~e.g., by setting the~~ The Ack Policy subfield of the frame shall be set to No ACK ~~Normal Ack or Implicit Block Ack Request~~ (# CID 11308)).

An AP may include a BQRP 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 equal to 1. If a STA receives a BQRP Trigger frame aggregated with control, data and management frames that solicits an acknowledgement, the response A-MPDU shall contain MPDUs in the order described in Table 9-428 (A-MPDU contents MPDUs in the control response context).

**End of proposed changes.**