IEEE P802.11  
Wireless LANs

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| CC23 MAC CR Miscellaneous Part 2 | | | | |
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Abstract

This submission proposes resolutions of comments received from TGax comment collection 23.   
(The proposed change is based on TGax Draft 0.5.)

* CIDs: 2490, 2505 (2 CID)

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** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| --- | --- | --- | --- | --- | --- |
| 2490 | 52.01 | 11.8.6 | 802.11 base specification is saying the following: "A non-AP STA shall use a transmit power less than or equal to the local maximum transmit power level for the channel." The local maximum transmit power level for the channel is determined based on the Power Constraint element and a Transmit Power Envelope element. But, please clarify whether the transmit power of the HE trigger-based PPDU can be the greater that the local maximum transmit power level. Because the AP controls the transmit power of the HE trigger-based PPDU through the Trigger frame. | As per comment | Revised-  When a STA does not know a regulatory requirement for a maximum transmit power level, it shall follow a local maximum transmit power level.  So, a transmit power of an HE trigger-based PPDU should not be greater than a local maximum transmit power level of its associated BSS.  TGax editor makes changes as shown in the as specified in 11-16/1353r0. |

**26.3.14.2 Power pre-correction**

…

***TGax editor: change the sub-clause 26.3.14.2 as the following:***

The UL transmit power of HE trigger-based PPDU is further subject to a STA's minimum and maximum transmit power limit due to hardware capability, regulatory requirements and local maximum transmit power levels (see 11.8.5 (Specification of regulatory and local maximum transmit power levels)) (#2490) as well as non-802.11 in-device coexistence requirements.

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| 2505 | 46.19 | 10.22.2.7 | Please clarify the bandwidth selection rule of an HE STA within a TXOP. Especially, when the RXVECTOR parameter CH\_BANDWIDTH of an HE trigger based PPDU is less than the TXVECTOR parameter CH\_BANDWIDTH of an immediately preceding DL PPDU, which a channel bandwidth is used for the next PPDU transmitted from the TXOP holder? | As per comment | Revised-  Agree in principal.  When the RXVECTOR parameter CH\_BANDWIDTH of an UL MU PPDU (e.g., HE trigger-based PPDU or CTS frame triggered by MU-RTS frame) is less than the TXVECTOR parameter CH\_BANDWIDTH of an immediately preceding DL PPDU that a TXOP holder transmits, a bandwidth selection rule of the following PPDUs transmitted from the TXOP holder (i.e., AP) shall be defined.  TGax editor makes changes as shown in the as specified in 11-16/1353r0. |

**Discussion)**

In IEEE 802.11ax, the MU-RTS and CTS procedure is very similar to a VHT dynamic bandwidth operation. But, an only difference is that a CTS frame triggered by an MU-RTS frame can not have the RXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT.

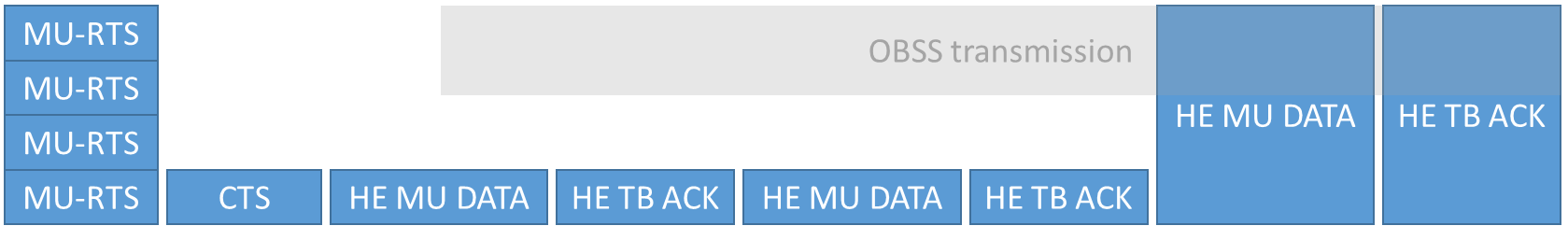
Current IEEE 802.11ax Draft 0.5 is saying:

*“An HE non-AP STA transmitting a CTS frame in response to an MU-RTS frame shall set the TXVECTOR parameter SCRAMBLER\_INITIAL\_STATE to the same value as the RXVECTOR parameter SCRAMBLER\_INITIAL\_STATE of the received MU-RTS frame.”*

If we consider all cases listed in 802.11ac, the following three options are possible.

Option 1) The TXOP holder shall set the TXVECTOR parameter CH\_BANDWIDTH of a PPDU to be the same or narrower than the TXVECTOR parameter CH\_BANDWIDTH of the RTS frame that has been sent by the TXOP holder in the same TXOP.

* Issue is that Option 1 allows to increase a PPDU bandwidth in the same TXOP although there is no full bandwidth protection through a RTS/CTS frame exchange. It is opposed to a concept of 11ac dynamic and static bandwidth operation.

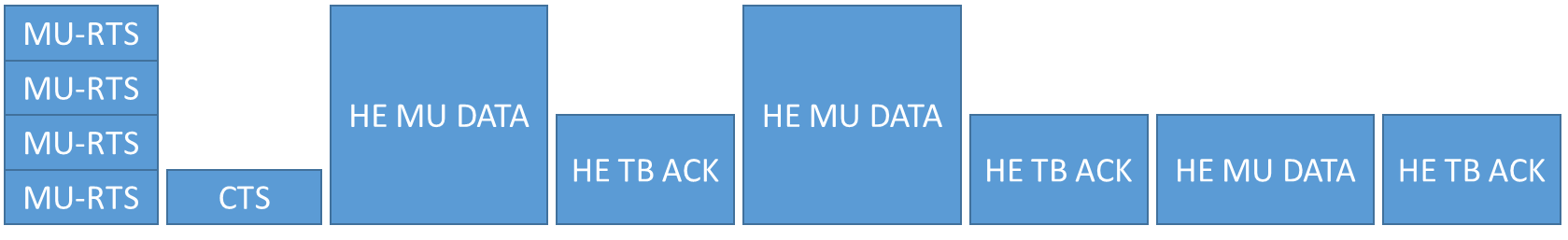


Option 2) The TXOP holder shall set the TXVECTOR parameter CH\_BANDWIDTH of a PPDU to be the same or narrower than the RXVECTOR parameter CH\_BANDWIDTH of the received CTS frame in the same TXOP.

* Issue is that the RXVECTOR parameter CH\_BANDWIDTH of the received CTS frame is an estimated bandwidth. Also, some HE AP may not support an estimated bandwidth through the received CTS frame.

Option 3) The TXOP holder shall set the TXVECTOR parameter CH\_BANDWIDTH of a PPDU to be the same or narrower than the TXVECTOR parameter CH\_BANDWIDTH of the preceding PPDU that it has transmitted in the same TXOP.

Among three options, our proposed solution is Option 3 and it is behaved as the following:



In above figure, the TXOP holder can not transmit 80MHz or 160MHZ PPDU after 3rd HE MU DATA PPDU. Because the TXVECTOR parameter CH\_BANDWIDTH of the preceding PPDU (3rd HE MU DATA) that it has transmitted is 40MHz.

***TGax editor: change the sub-clause 10.22.2.7 as the following:***

**10.22.2.7 Multiple frame transmission in an EDCA TXOP**

…

If a TXOP is protected by an RTS or CTS frame carried in a non-HT or a non-HT duplicate PPDU, the TXOP holder shall set the TXVECTOR parameter CH\_BANDWIDTH of a PPDU as follows:

* To be the same or narrower than RXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT of the last received CTS frame in the same TXOP, if the RTS frame with a bandwidth signaling TA and TXVECTOR parameter DYN\_BANDWIDTH\_IN\_NON\_HT set to Dynamic has been sent by the TXOP holder in the last RTS/CTS exchange.
* Otherwise, to be the same or narrower than the TXVECTOR parameter CH\_BANDWIDTH of the RTS frame that has been sent by the TXOP holder in the last RTS/CTS exchange in the same TXOP.

If a TXOP is protected by an MU-RTS or CTS frame carried in a non-HT or a non-HT duplicate PPDU, the TXOP holder shall set the TXVECTOR parameter CH\_BANDWIDTH of a PPDU as follows:

* To be the same or narrower than the TXVECTOR parameter CH\_BANDWIDTH of the MU-RTS frame that has been sent by the TXOP holder in the last MU-RTS/CTS exchange in the same TXOP, if the MU-RTS frame with the RU Allocation subfield in the User Info field addressed to the all STAs set to the total PPDU bandwidth indicated in the BW subfield in the Common Info field has been sent.
* Otherwise, to be the same or narrower than the TXVECTOR parameter CH\_BANDWIDTH of the preceding PPDU that it has transmitted in the same TXOP.

If there is no RTS/CTS or MU-RTS/CTS exchange in non-HT duplicate format in a TXOP, and the TXOP includes at least one non-HT duplicate frame exchange that does not include a PS-Poll, then the TXOP holder shall set the CH\_BANDWIDTH parameter in TXVECTOR of a PPDU sent after the first non-HT duplicate frame that is not a PS-Poll to be the same or narrower than the CH\_BANDWIDTH parameter in TXVECTOR of the initial frame in the first non-HT duplicate frame exchange in the same TXOP.

If there is no non-HT duplicate frame exchange in a TXOP, the TXOP holder except when it transmits an HE MU PPDU with the TXVECTOR parameter CH\_BANDWIDTH set to 4, 5, 6 or 7 shall set the TXVECTOR parameter CH\_BANDWIDTH of a non-initial PPDU to be the same or narrower than the TXVECTOR parameter CH\_BANDWIDTH of the preceding PPDU that it has transmitted in the same TXOP. If there is no non-HT duplicate frame exchange in a TXOP, the TXOP holder transmitting an HE MU PPDU with the TXVECTOR parameter CH\_BANDWIDTH set to 4, 5, 6 or 7 shall set the TXVECTOR parameter RU\_ALLOCATION of a non-initial PPDU to be within a set of 20 MHz channels where pre-HE modulated field of the preceding PPDU that it has transmitted in the same TXOP are located.

If a TXOP is protected by a CTS-to-self frame carried in a non-HT or non-HT duplicate PPDU, the TXOP holder shall set the TXVECTOR parameter CH\_BANDWIDTH of a PPDU to be the same or narrower than the TXVECTOR parameter CH\_BANDWIDTH of the CTS-to-self frame in the same TXOP.

***TGax editor: Change Table 26-1 as the following:***

**Table 26-1—TXVECTOR and RXVECTOR parameters (#1780)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Condition | Value | TXVECTOR | RXVECTOR |
| CH\_BANDWIDTH | FORMAT is HE\_SU ~~or HE\_EXT\_SU~~ ~~or HE\_TRIG~~ | Indicates the channel width of the transmitted PPDU.  Enumerated type:  CBW20 for 20 MHz  CBW40 for 40 MHz  CBW80 for 80 MHz  CBW160 for 160 MHz  CBW80+80 for 80+80 MHz | Y | Y |
| HE\_EXT\_SU | Indicates the channel width of the transmitted PPDU.  Enumerated type:  242-tone RU, right 106-tone RU within the primary 20  MHz | Y | Y |
| FORMAT is HE\_MU | Indicates the channel occupied by the transmitted PPDU, supporting channel bonding. See the field of Bandwidth in Table 26-~~16~~17 (Fields in the HE-SIG-A for an HE MU PPDU) | Y | Y |
| FORMAT is HE\_TRIG | In TXVECTOR, indicates the Bandwidth field of the HE-SIG-A in the transmitted PPDU.  In RXVECTOR, indicates the estimated channel width of the received PPDU. Enumerated type:  CBW20 for 20 MHz  CBW40 for 40 MHz  CBW80 for 80 MHz  CBW160 for 160 MHz  CBW80+80 for 80+80 MHz  NOTE—The TXVECTOR parameter CH\_BANDWIDTH does not represent the channel width of the transmitted PPDU. | Y | Y |
| Otherwise | See corresponding entry in Table 21-1 (TXVECTOR and RXVECTOR parameters). | Y | Y |