IEEE P802.11
Wireless LANs

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| Resolution for CIDs 1156, 1489 and 113 |
| Date: 2011-05-03 |
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Abstract

This document proposes a resolution for CIDs 1156, 148 and 113 (comment on P802.11ac/D0.1).

Editing instructions based on P802.11ac/D0.3.

## Comments

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| --- | --- | --- | --- | --- | --- | --- | --- |
| 1156 | Stacey, Robert | 9.6.0e.6 | 47 | 6 | TR | Providing BW signaling in all control frames is not necessary and complicates implementation. In some implementations BAR/BA is always 20 MHz (more robust). Make BW signaling for 20 MHz in Non-HT frames optional and only require it in 40 MHz (or wider) non-HT duplicate.  | Change paragraph to read "A VHT STA that transmits a control frame carried in non-HT or non-HT duplicate format (40 MHz or wider) and addressed to a VHT STA and eliciting a control response frame or a sounding feedback management frame shall set the INDICATED\_CH\_BANDWIDTH TXVECTOR parameter of the control frame to the same value as the CH\_BANDWIDTH TXVECTOR parameter and shall set the Individual/Group bit in the TA field to 1. NOTE--A VHT STA is not required to signal frame badwdith in a 20 MHz non-HT format frame." |
| 1489 | Lv, Kaiying | 9.6.0e.6 | 47 | 14 | TR | The description here is not consistant with the description in the immediately following paragraph. | change the first sentence to " An HT or VHT STA that receives a frame without a valid INDICATED\_CH\_BANDWIDTH\_RXVECTOR parameter and that…."  |
| 113 | Au, Edward (Kwok Shum) | 9.6.0e.6 | 48 | 21 | TR | When the INDICATED\_CH\_BANDWIDTH RXVECTOR value is NON\_HT\_CBW80+80, the mapping CH\_BANDWIDTH TXVECTOR value cannot be HT\_CBW160. | Change "HT\_CBW160, NON\_HT\_CBW20, NON\_HT\_CBW40,..." into "HT\_CBW80+80, NON\_HT\_CBW20, NON\_HT\_CBW40,..." |

## Discussion

When non-HT format frames are sent over 20 MHz only, there is no need to add BW signalling. Propose that BW signalling NOT be required for 20 MHz non-HT format frames.

Reasoning:

* Backward compatible with legacy behavior.
* 20 MHz is the most robust BW for BAR/BA. Implementations that already do BAR/BA in 20 MHz should not be required to add BW signalling. Doing so would require them to distinguish between VHT and non-VHT recipients.
* Adding BW signalling in these cases also weakens PAPR mitigation

In developing this resolution it was found that the existing text was not specific enough as to which frames requirements regarding CH\_BANDWIDTH\_IN\_NON\_HT apply.

## Resolution

AGREE IN PRINCIPLE. Editing instructions below.

***Editing note:***

***Throughout the document, replace***

***- HT\_CBW20 and NON\_HT\_CBW20 with CBW20***

***- HT\_CBW40 and NON\_HT\_CBW40 with CBW40***

***- HT\_CBW80 and NON\_HT\_CBW80 with CBW80***

***- HT\_CBW160 and NON\_HT\_CBW160 with CBW160***

***- HT\_CBW80+80 and NON\_HT\_CBW80+80 with CBW80+80***

***In some places, packet format is implicit in CH\_BANWIDTH. For example, CH\_BANDWIDTH equal to HT\_CBW20 means FORMAT equal to HT\_MF or HT\_GF and CH\_BANDWIDTH equal to CBW20. With the reduction in meaning in CH\_BANDWIDTH this needs to be made explicit.***

**9.3.2.6a VHT RTS procedure**

A VHT STA transmitting an RTS frame carried in non-HT or non-HT duplicate format and addressed to a VHT STA shall set the Individual/Group bit in the TA field to 1 and shall set the TXVECTOR parameters CH\_BANDWIDTH\_IN\_NON\_HT and CH\_BANDWIDTH to the same value. If the STA sending the RTS frame is using dynamic bandwidth operation, it shall set the TXVECTOR parameter DYN\_BANDWIDTH\_IN\_NON\_HT to Dynamic. Otherwise, the STA shall set the TXVECTOR parameter DYN\_BANDWIDTH\_IN\_NON\_HT to Static.

A VHT STA that initiates a TXOP by transmitting an RTS with the Individual/Group bit in theTA field set to 1, shall not send an RTS to a non-VHT STA for the duration of the TXOP.

**9.3.2.7 CTS procedure**

A STA that receives an RTS frame addressed to it considers the NAV in determing whether or not to respond with CTS unless the NAV was set by a frame originating from the STA sending the RTS frame (see 9.19.2.2 (EDCA TXOPs)). Thus, in this subclause, NAV indicates idle means that the NAV count is 0 or that the NAV count is not 0 but the MAC address in the TA field of the RTS frame with the Individual/Group bit forced to 0 matches the saved TXOP holder MAC address.

A VHT STA that is addressed by an RTS frame that has the Individual/Group bit in the TA equal to 1 and that has the RXVECTOR parameter DYN\_BANDWIDTH\_IN\_NON\_HT equal to Static, behaves as follows:

* If the NAV indicates idle and CCA has been idle for all secondary channels in the channel width indicated by the RTS frame’s RXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT a period PIFS prior to the start of the RTS frame, then the STA shall respond with a non-HT or non-HT duplicate CTS frame. The CTS frame’s TXVECTOR parameters CH\_BANDWIDTH and CH\_BANDWIDTH\_IN\_NON\_HT shall be set to the same value as the RTS frame’s RXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT.
* Otherwise the STA shall not respond with a CTS frame.

A VHT STA that is addressed by an RTS frame that has the Individual/Group bit in the TA equal to 1 and that has the RXVECTOR parameter DYN\_BANDWIDTH\_IN\_NON\_HT equal to Dynamic, behaves as follows:

* If the NAV indicates idle, then the STA shall respond with a non-HT or non-HT duplicate CTS frame. The CTS frame’s TXVECTOR parameters CH\_BANDWIDTH and CH\_BANDWIDTH\_IN\_NON\_HT may be set to any channel width for which CCA on all secondary channels has been idle PIFS prior to the start of the RTS frame and that is equal to or less than the channel width indicated in the RTS frame’s RXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT.
* Otherwise the STA shall not respond with a CTS frame.

A non-VHT STA that is addressed by an RTS frame or a VHT STA that is addressed by an RTS frame that has the Individual/Group bit in the TA equal to 0 behaves as follows:

* If the NAV indicates idle, the STA shall respond with a CTS frame.
* Otherwise, the STA shall not respond with a CTS frame.

The RA field of the CTS frame shall be set to the MAC address obtained from the TA field of the RTS frame to which this CTS frame is a response with the Individual/Group bit set to 0. The Duration field in the CTS frame shall be the duration field from the received RTS frame, adjusted by subtraction of aSIFSTime and the number of microseconds required to transmit the CTS frame at a data rate determined by the rules in 9.7 (Multirate support).

**9.7.5.6 Channel Width selection for control frames**

***Insert the following as the first paragraph:***

A VHT STA that transmits a control frame that is not an RTS frame in a non-HT duplicate format (channel width 40 MHz or wider), addressed to a VHT STA and eliciting a control response frame or a VHT Compressed Beamforming frame shall set the Individual/Group bit in the TA field to 1 and shall set the TXVECTOR parameters CH\_BANDWIDTH\_IN\_NON\_HT and CH\_BANDWIDTH to the same value. A VHT STA that transmits a control frame that is not an RTS frame in a non-HT format (channel width 20 MHz), addressed to a VHT STA and eliciting a control response frame or a VHT Compressed Beamforming frame may set the Individual/Group bit in the TA field to 1, in which case it shall set the TXVECTOR parameters CH\_BANDWIDTH\_IN\_NON\_HT and CH\_BANDWIDTH to the same value. Channel width selection rules for RTS frames are described in 9.3.2.6a (VHT RTS procedure)

***Change the remainder as follows:***

***Delete Table 9-3.***

A STA that sends a control frame in response to a HT or VHT format frame shall set the TXVECTOR parameter CH\_BANDWIDTH to indicate a channel width that is same as the channel width inidicated by thebRXVECTOR parameter CH\_BANDWIDTH for the frame eliciting the reponse.

A STA that sends a control frame in response to a non-HT or non-HT duplicate frame with the Individual/Group bit in the TA field equal to 0:

* Should set the TXVECTOR parameter CH\_BANDWIDTH to the same value as the RXVECTOR parameter CH\_BANDWIDTH for the frame eliciting the response.
* Shall not set the TXVECTOR parameter CH\_BANDWIDTH to a value greater than the RXVECTOR parameter CH\_BANDWIDTH for the frame eliciting the response.

NOTE—This rule permits an implementation that receives a non-HT duplicate frame but is not able to detect the channel bandwidth occuplied by the frame, either by design or because the frame was received over a channel bandwidth narrower than it was transmitted, to respond with a 20 MHz PPDU.

A VHT STA that sends a control frame that is not a CTS in response to a non-HT or non-HT duplicate format frame with the Individual/Group bit in the TA field equal to 1, shall set the TXVECTOR parameter CH\_BANDWIDTH to the same value as the RXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT for the frame eliciting the response. For the channel width selection rules for CTS sent in response to an RTS with the Individual/Group bit in the TA field equal to 1 see 9.3.2.7 (CTS procedure).

***Delete Table 9-3a.***

**9.19.2.2 EDCA TXOPs**

***Edit the last paragraph of section 9.19.2.2 as follows:***

A STA shall save the TXOP holder address for the BSS in which it is associated, which is the MAC address from the Address 2 field of the frame that initiated a frame exchange sequence except when this is a CTS frame, in which case the TXOP holder address is the Address 1 field. If the TXOP holder address is obtained from a control frame, the STA shall save the value with the Individual/Group bit forced to 0. If an RTS frame is received with the RA address matching the MAC address of the STA and the MAC address in the TA field in the RTS frame matches the saved TXOP holder address, then the STA shall send the CTS frame after SIFS, without regard for, and without resetting, its NAV. When a STA receives a frame addressed to it that requires an immediate response, except in the case of an RTS, it shall transmit the response independent of its NAV. The saved TXOP holder address shall be cleared when the NAV is reset or when the NAV counts down to 0.