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Wireless LANs

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| Resolution for CID 11018 |
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Abstract

This submission proposes a resioltuion for CID 11018

## CID 11018

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| 11018 | 3.2 | 6 | 1 | There is an inconsistency between the definitions of "HT beamformee" and "VHT beamformee".Both are defined as receiving PPDUs transmitted with beamforming steering matrix, but the definition of HT beamformee includes additional restrictions. These restrictions would also apply to VHT. | Make definitions consistent. This might also affect the definition of "MU beamformee" |

## Discussion

The current definition of HT beamformee is:

**high throughput (HT) beamformee**: An HT station (STA) that receives an HT physical layer protocol data unit (PPDU) that was transmitted using a beamforming steering matrix and that supports an HT transmit beamforming mechanism as beamformee, as described in 9.29.2 (HT tTransmit beamforming with implicit feedback) or 9.29.3 (Explicit feedback beamforming).

Compare this with the definition of VHT beamformee:

**very high throughput (VHT) beamformee**: A VHT station (STA) that receives a VHT physical layer protocol data unit (PPDU) that was transmitted using a beamforming steering matrix.

Both definitions capture the fact that the beamformee receives PPDUs that were transmitted using a steering matrix. However, the HT definition also includes the feedback capabilities of the STA.

Interestingly, in 802.11-2012, the definition of “beamformee” (i.e. HT beamformee) is:

 

Apparently, the definition has been updated as part of the 802.11ac comment resolution process, but the same correction has not been applied to VHT beamformee (or MU beamformee for that matter).

In Table 8-183v, Beamformee capability is described as follows:



A relevant extract from the reference section reads:

A non-AP VHT beamformee that receives a VHT NDP Announcement frame from a VHT beamformer with which it is associated or has an established DLS or TDLS session and that contains the VHT beamformee's AID in the AID subfield of the first (or only) STA Info field and also receives a VHT NDP a SIFS after the VHT NDP Announcement frame, shall transmit the PPDU containing its VHT Compressed Beamforming feedback a SIFS after the VHT NDP. A VHT beamformee that is an AP, mesh STA, or STA that is a member of an IBSS, that receives a VHT NDP Announcement frame with the RA matching its MAC address and the AID subfield of the only STA Info field set to 0, and that also receives a VHT NDP a SIFS after the VHT NDP Announcement frame, shall transmit the PPDU containing its VHT Compressed Beamforming feedback a SIFS after the VHT NDP. The TXVECTOR parameter CH\_BANDWIDTH of the PPDU containing the VHT Compressed Beamforming feedback shall be set to indicate a bandwidth not wider than that indicated in the RXVECTOR parameter CH\_BANDWIDTH of the received VHT NDP frame. A STA ignores received VHT NDP Announcement, VHT NDP, and Beamforming Report Poll frames if dot11VHTSUBeamformeeActivated is false.

In essence, to be a beamformee, the STA has to actively support the feedback part of the relevant sounding protocol. A STA does not qualify as a beamformee simply by passively receiving PPDUs that have been transmitted using a steering matrix. Presumably, this was the reasoning that led to the update of the definition of “HT beamformee”. Similar changes should therefore be applied to the definitions of “VHT beamformee” and “MU beamformee”.

An issue with the current definition of “HT beamformee” is that it becomes somewhat circular, requiring that a beamformee (…) “supports an HT transmit beamforming mechanism as beamformee”.

## Proposal

We therefore propose the following changes:

**high throughput (HT) beamformee**: An HT station (STA) that receives an HT physical layer protocol data unit (PPDU) that was transmitted using a beamforming steering matrix and that supports the HT beamforming feedback mechanism as described in 9.29.2 (HT tTransmit beamforming with implicit feedback) or 9.29.3 (Explicit feedback beamforming).

**very high throughput (VHT) beamformee**: A VHT station (STA) that receives a VHT physical layer protocol data unit (PPDU) that was transmitted using a beamforming steering matrix and that supports the VHT beamforming feedback mechanism for SU STAs, as described in 9.31.5 (VHT Sounding protocol).

**multi-user (MU) beamformee**: A non-access point (non-AP) station (STA) that receives a physical layer protocol data unit (PPDU) that was transmitted using a multi-user beamforming steering matrix and that supports the VHT beamforming feedback mechanism for MU capable STAs, as described in 9.31.5 (VHT Sounding protocol).