IEEE P802.11
Wireless LANs

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| Clarifying Restrictions on Compressed Beamforming Feedback and MU-PPDUs |
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Abstract

This document proposes a clarifying restriction on compressed beamfroming feedback based on NDPs, and a clarifying restriction on MU-PPDUs.

The resolutions are based on Draft P802.11ac\_D1.1.

**Discussion**

Two clarifications are needed in the current 11ac draft:

1. Currently, it isn’t strictly required that a beamformee feeds back a compressed beamforming report with the number of rows of the beamforming matrix (Nr) set equal to the Nsts field in the VHT-SIG-A of the NDP it is based on. If a client would send back Nr < Nsts of the NDP, then the information of how the fewer rows in the feedback report should be mapped to beamformer transmit antennas is missing. The simplest and most useful solution is to require that a beamformee always uses Nr equal to the Nsts of the NDP it is based on.
2. Currently, it is not clear howmany total number of spatial streams in MU-PPDUs (summed across all NUM\_USERS users) a user can support. We propose to set it equal to the user’s Compressed Steering Number of Beamformer Antennas Supported in the VHT Capabilities Info field, because the user can process the corresponding number of VHT-LTFs for NDPs as indicated by this field, so the expectation is that the user can also process the same number of VHT-LTFs in MU transmissions.

**Editor instructions**

*Editor, add a paragraph after the first paragraph of 22.3.11.2 Beamforming Feedback Matrix V as follows*

**22.3.11.2 Beamforming Feedback Matrix V**

Upon receipt of an NDP sounding PPDU, the beamformee shall remove the space-time stream CSD in

Table 22-9 (Cyclic shift values of VHT portion of packet) from the measured channel before computing a set of matrices for feedback to the beamformer. The beamforming feedback matrix, Vk,j, found by the beamformee j for subcarrier k shall be compressed in the form of angles using the method described in 19.3.12.3.6 (Compressed beamforming feedback matrix). The angles, φ(k) and ψ(k), are quantized according to Table 8-ac6 (Quantization of angles). The number of bits for quantization may be chosen by beamformee, based on the indication from the beamformer as to (#3710)whether the feedback is requested for SU-MIMO beamforming or MU-MIMO beamforming. The compressed beamforming feedback using 19.3.12.3.6 (Compressed beamforming feedback matrix) is the only Clause 22 beamforming feedback format defined.

The beamformee shall generate the beamforming feedback matrices with the number of rows (*Nr*) equal to the *NSTS* of the NDP.

*Editor, please add the following subclause to 22.3.11 SU-MIMO and MU-MIMO Beamforming*

**22.3.11.4 Maximum Number of Total Spatial Streams in MU PPDUs**

An MU capable STA shall support reception of MU PPDUs with the total number of space-time streams across the NUM\_USERS users being less than or equal to its Compressed Steering Number of Beamformer Antennas Supported in the VHT Capabilities Info field.