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Wireless LANs

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| CID 5879 | | | | |
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|  |  |  |  |  |

Abstract

This document proposes a resolution for CID 5879.

CID 166

# Introduction

CID 5879 points out that the maximum number of streams that a STA can process in an NDP and the maximum value for NSTS,total that the STA can receive in an MU PPDU are essentially two different capabilities. However, in the current MU capability indication, the two values are forced to be the same.

Further discussion and background can be found in [1] and [2].

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 5879 | 8.4.2.157.2 | 1040 | 49 | "Beamformee STS Capability" links the sounding feedback capability of a STA with the total number of streams that a STA can receive in an MU PPDU. There is no reason these values should be the same and they should be decoupled to be future-safe.  The issue is explained in more detail in document IEEE 802.11-15/0057. | Will bring a detailed text proposal for this comment. |

The proposal is to slightly change the indication of the capabilities to allow a decoupling of the two. The proposal in this document is the same as originally proposed in [1]. It was shown that this proposed modification is backwards compatible with the existing spec. See [1] for details.

Proposed resolution: Revised

Implement the text changes listed in section “Text Changes” of this document.

# Text Changes

1. Page 1040, Line 49:

Modify the definition of Beamformee STS Capability subfield in Table 8-240 [3] (Subfields of the VHT Capabilities Info field) as follows:

**Table 8-240—Subfields of the VHT Capabilities Info field**

|  |  |  |
| --- | --- | --- |
| Beamformee STS Capability | Indicates the ~~The~~ maximum number of space-time streams that the STA can receive in a VHT NDP~~, the maximum value for~~ *~~NSTS,total~~* ~~that can be sent to the STA in a VHT MU PPDU if the STA is MU beamformee capable,~~ and the maximum value of *Nr* that the STA transmits in a VHT Compressed Beamforming frame. | If SU beamformee capable, set to maximum number of space-time streams that the STA can receive in a VHT NDP minus 1.  Otherwise, reserved. |

1. Page 1042, Line 53:

Modify the definition of the Supported VHT-MCS and NSS Set field in Figure 8-556 [3] as follows:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Rx VHT-MCS Map | Rx Highest Supported Long GI Data Rate | ~~Reserved~~  Maximum NSTS,total | Tx VHT-MCS Map | Tx Highest Supported Long GI Data Rate | Reserved |
| 16 | 13 | 3 | 16 | 13 | 3 |

**Figure 8-556—Supported VHT-MCS and NSS Set field**

1. Page 1043, Line 1:

Modify Table 8-241 [3] (Supported VHT-MCS and NSS Set subfields) as follows:

**Table 8-241—Supported VHT-MCS and NSS Set subfields**

|  |  |  |
| --- | --- | --- |
| **Subfield** | **Definition** | **Encoding** |
| Rx VHT-MCS Map | Indicates the maximum value of the RXVECTOR parameter MCS of a PPDU that can be received at all channel widths supported by this STA for each number of spatial streams. | The format and encoding of this subfield are defined in Figure 8-401bs and the associated description. |
| Rx Highest Supported Long GI Data Rate | Indicates the highest long GI VHT PPDU data rate that the STA is able to receive. | The largest integer value less than or equal to the highest long GI VHT PPDU data rate in Mb/s the STA is able to receive (see 9.7.11.1).  The value 0 indicates that this subfield does not specify the highest long GI VHT PPDU data rate that the STA is able to receive. |
| Maximum NSTS,total | Indicates the maximum value for NSTS,total that can be sent to the STA in a VHT MU PPDU | If MU beamformee capable and different from 0, indicates the maximum value for NSTS,total minus 1 that can be sent to the STA in a VHT MU PPDU.  NOTE – This value is greater than or equal to the value in the Beamformee STS Capability subfield of the VHT Capabilities Info field.  If MU Beamformee capable and equal to 0, indicates that the maximum value for NSTS,total is equal to the value in the Beamformee STS Capability subfield of the VHT Capabilities Info field.  Otherwise reserved. |
| Tx VHT-MCS Map | Indicates the maximum value of the TXVECTOR parameter MCS of a PPDU that can be transmitted at all channel widths supported by this STA for each number of spatial streams. | The format and encoding of this subfield are defined in Figure 8-401bs and the associated description. |
| Tx Highest Supported Long GI Data Rate | Indicates the highest long GI VHT PPDU data rate that the STA is able to transmit at. | The largest integer value less than or equal to the highest long GI VHT PPDU data rate in Mb/s that the STA is able to transmit (see 9.7.11.2).  The value 0 indicates that this subfield does not specify the highest long GI VHT PPDU data rate that the STA is able to transmit. |

1. Page 1424, Lines 63-64:

Delete (NOTE: this change has already been implemented as part of the resolution of comment 5900)

~~The value of~~ *~~Nr~~* ~~within an explicit Beamforming feedback frame transmitted by a VHT beamformee shall not exceed the value indicated in the Beamformee STS Capability subfield of the VHT Capabilities element.~~

1. Page 1436, Lines 6-9:

Modify paragraph.

A VHT beamformee shall indicate the maximum number of space-time streams it can receive in a VHT NDP in the Beamformee STS Capability subfield of the VHT Capabilities Info field of the VHT Capabilities element ~~field~~. If the beamformee is a non-AP STA, this shall ~~also~~ be less than or equal to the maximum total number of space-time streams that the STA can receive in a VHT MU PPDU.

1. Page 2539, Lines 49-55:

Modify subclause 22.3.11.3 as follows:

**22.3.11.3 Maximum Number of Total Spatial Streams in VHT MU PPDUs**

An MU-capable STA shall support reception of VHT MU PPDUs with the total number of space-time streams across the N\_user users being less than or equal to the value indicated in the Maximum NSTS,total subfield of the Supported VHT-MCS and NSS Set field of the VHT Capabilities element ~~its Beamformee STS Capability the VHT Capabilities Info field~~.

# References

[1] MU Beamformee capabilities indication in VHT, IEEE 802.11-15/0057

[2] Discussion of CID 5879, IEEE 802.11-15/0668

[3] IEEE P802.11-REVmc/D4.0, January 2015