### **IEEE P802.11 Wireless LANs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| PDT Supported EHT MCS and Nss Set Field | | | | |
| Date: 2021-03-18 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | Email |
| Steve Shellhammer | Qualcomm |  |  | shellhammer@ieee.org |
| Rui Cao | NXP |  |  | rui.cao\_2@nxp.com |
| Liwen Chu | NXP |  |  | liwen.chu@nxp.com |
| Yan Zhang | NXP |  |  | yan.zhang\_5@nxp.com |
| Bo Gong | Huawei |  |  | gongbo8@hisilicon.com |
| Genadiy Tsodik | Huawei |  |  | genadiy.tsodik@huawei.com |
| Wook Bong Lee | Samsung |  |  | wookbong.lee@samsung.com |
| Bin Tian | Qualcomm |  |  | btian@qti.qualcomm.com |
| Mengshi Hu | Huawei |  |  | humengshi@huawei.com |

**Introduction**

This document provides proposed draft text for Subclause 9.4.2.XXX Supported EHT-MCS and Nss Set, in IEEE 802.11be D0.5.

The following Straw Polls apply to this PDT:

* **For the Supported MCS and Nss Set field, do you agree to signal the maximum number of spatial streams supported for a given MCS set, using the table below?**
  + **Note: This can be extended to support up to 16 spatial streams in R2**

|  |  |
| --- | --- |
| 4-bit field value | Max Number of Nss that supports the specified EHT-MCS |
| 0 | Not supported |
| 1 | 1 |
| 2 | 2 |
|  |  |
| 8 | 8 |
| 9 | Reserved |
|  |  |
| 15 | Reserved |

* **Do you support the following Supported MCS and Nss Set Field and the EHT-MCS Map Subfield format?**

Supported MCS and Nss Set Field



EHT-MCS Map Subfield Format (BW = 80/160/320 MHz)



EHT-MCS Map Subfield Format (BW = 20 MHz)



* **Do you support the Basic EHT-MCS And MCS Set Field format show below?**



***TGbe editor: Please insert a new subclause, right after 9.4.2.295c.1 EHT PHY Capabilities Information field, in Clause 9:***

9.4.2.XXX.X Supported EHT MCS and Nss Set Field

The Supported EHT-MCS And NSS Set field indicates the combinations of EHT-MCS 0-13, and number of spatial streams Nss, that a STA supports for reception and the combinations that it supports for transmission. The format of the field is shown in Figure 9-F1 (Supported EHT-MCS And NSS Set field format). EHT MCS 14 and 15 can only be combined with a single stream, and are indicated in 9.4.2.295c.1 EHT PHY Capabilities Information field.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  | EHT-MCS Map  (20 MHz-Only STA) | EHT-MCS Map  (BW 80 MHz, Except 20 MHz-Only STA) | EHT-MCS Map  (BW=160 MHz) | EHT-MCS Map  (BW=320 MHz) |
| Octets: | 0 or 4 | 0 or 3 | 0 or 3 | 0 or 3 |

**Figure 9-F1 — Supported EHT-MCS And NSS Set field format**

The subfields of the Supported EHT-MCS And NSS Set field, and their presence, are defined in Table 9-T1 (Subfields of the Supported EHT-MCS And NSS Set field).

**Table 9-T1 — Subfields of the Supported EHT-MCS And NSS Set field**

|  |  |  |
| --- | --- | --- |
| Subfield | Definition | Encoding |
| EHT-MCS Map  (20 MHz-Only STA) | For a 20 MHz-only STA, indicates the maximum number of spatial streams supported for reception and the maximum number of spatial streams that the STA can transmit, for each MCS value. | The format and encoding of this subfield are defined in Figure –F1 (Supported EHT-MCS and NSS Set field format) and the associated description.  If B0, B1, B2 and B3 of the Supported Channel Width Set, in the HE PHY Capabilities Information field are all 0, then this field is present; otherwise, it is not present. |
| EHT-MCS Map  (BW 80 MHz, Except 20 MHz-Only STA) | If the operating channel width of the STA is greater than or equal to 80 MHz, indicates the maximum number of spatial streams supported for reception and the maximum number of spatial streams that the STA can transmit, for each MCS value, in a PPDU with a bandwidth of 20, 40 or 80 MHz. | The format and encoding of this subfield are defined in Figure –F1 (Supported EHT-MCS and NSS Set field format) and the associated description.(#24302)  If B1 of the Supported Channel Width Set, in the HE PHY Capabilities Information field is 1, then this field is present; otherwise, it is not present. |
| EHT-MCS Map  (BW = 160 MHz) | If the operating channel width of the STA is greater than or equal to 160 MHz, indicates the maximum number of spatial streams supported for reception and the maximum number of spatial streams that the STA can transmit, for each MCS value, in a PPDU with a bandwidth of 160 MHz. | The format and encoding of this subfield are defined in Figure –F1 (Supported EHT-MCS and NSS Set field format) and the associated description.(#24302)  If B2 of the Supported Channel Width Set, in the HE PHY Capabilities Information field is 1, then this field is present; otherwise, it is not present. |
| EHT-MCS Map  (BW = 320 MHz) | If the operating channel width of the STA is 320 MHz, indicates the maximum number of spatial streams supported for reception and the maximum number of spatial streams that the STA can transmit, for each MCS value, in a PPDU with a bandwidth of 320 MHz. | The format and encoding of this subfield are defined in Figure –F1 (Supported EHT-MCS and NSS Set field format) and the associated description.(#24302)  If the Support For 320 MHz in 6 GHz subfield, in the EHT PHY Capabilities Information field is 1, then this field is present; otherwise, it is not present. |

The EHT-MCS Map (20 MHz-Only STA) subfield and the Basic EHT-MCS And NSS Set field have the format shown in Figure 9-F2 (EHT-MCS Map (20 MHz-Only STA) subfield and Basic EHT-MCS And NSS Set field format).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 B3 | B4 B7 | B8 B11 | B12 B15 | B16 B19 | B20 B23 | B24 B27 | B28 B31 |
|  | Rx Max Nss That Supports EHT-MCS 0-7 | Tx Max Nss That Supports EHT-MCS 0-7 | Rx Max Nss That Supports EHT-MCS 8-9 | Tx Max Nss That Supports EHT-MCS 8-9 | Rx Max Nss That Supports EHT-MCS 10-11 | Tx Max Nss That Supports EHT-MCS 10-11 | Rx Max Nss That Supports EHT-MCS 12-13 | Tx Max Nss That Supports EHT-MCS 12-13 |
| Bits: | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |

**Figure 9-F2 — EHT-MCS Map (20 MHz-Only STA) subfield and Basic EHT-MCS And NSS Set field format**

The EHT-MCS Map (BW 80 MHz, Except 20 MHz-Only STA), EHT-MCS Map (BW = 160 MHz) and EHT-MCS Map (BW = 320 MHz) subfields have the format shown in Figure 9-F3 (EHT-MCS Map (BW 80 MHz, Except 20 MHz-Only STA), EHT-MCS Map (BW = 160 MHz) and EHT-MCS Map (BW = 320 MHz) subfield format).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | B0 B3 | B4 B7 | B8 B11 | B12 B15 | B16 B19 | B20 B23 |
|  | Rx Max Nss That Supports EHT-MCS 0-9 | Tx Max Nss That Supports EHT-MCS 0-9 | Rx Max Nss That Supports EHT-MCS 10-11 | Tx Max Nss That Supports EHT-MCS 10-11 | Rx Max Nss That Supports EHT-MCS 12-13 | Tx Max Nss That Supports EHT-MCS 12-13 |
| Bits: | 4 | 4 | 4 | 4 | 4 | 4 |

**Figure 9-F3 — EHT-MCS Map (BW 80 MHz, Except 20 MHz-Only STA), EHT-MCS Map (BW = 160 MHz) and EHT-MCS Map (BW = 320 MHz) subfield format**

The Max Nss That Supports EHT-MCS 0-7 is encoded according to Table 9-T2

The Max Nss That Supports EHT-MCS 0-9 is encoded according to Table 9-T2

The Max Nss That Supports EHT-MCS 8-9 is encoded according to Table 9-T2

The Max Nss That Supports EHT-MCS 10-11 is encoded according to Table 9-T2

The Max Nss That Supports EHT-MCS 12-13 is encoded according to Table 9-T2

**Table 9-T2 —** **Max Nss That Supports Specified MCS Set Subfield Format**

|  |  |
| --- | --- |
| **Max Nss That Supports Specified MCS Set Subfield** | **The Maximum Number of Spatial Streams That Supports the Specified MCS Set** |
| 0 | Not Supported |
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |
| 9 | Reserved |
| 10 | Reserved |
| 11 | Reserved |
| 12 | Reserved |
| 13 | Reserved |
| 14 | Reserved |
| 15 | Reserved |

A value that is Reserved in Table 9-T2 (Max Nss That Supports Specified MCS Set Subfield Format) indicates an Max Nss of greater than eight spatial streams.

The maximum receive Nss for a given EHT-MCS is equal to the smaller of:

* The value of the Rx Max Nss That Supports Specified MCS subfield for the given EHT-MCS
* The maximum supported(#24396) Nss as indicated by the value of the Rx NSS field of the Operating Mode Notification frame if the value of Rx NSS Type is 0 or of the OM Control subfield

The maximum transmit Nss(#24396) for a given EHT-MCS is equal to the smaller of:

* The value of the Tx Max Nss That Supports Specified MCS subfield for the given EHT-MCS
* The maximum supported NSS as indicated by the value of the Tx NSS field of the OM Control subfield sent by a non-AP STA