IEEE P802.11
Wireless LANs

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| Multiple BSSID and MU |
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Abstract

This submission proposes the solution for Multiple BSSID and MU operation.

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGax Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGax Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGax Editor: Editing instructions preceded by “TGax Editor” are instructions to the TGax editor to modify existing material in the TGax draft. As a result of adopting the changes, the TGax editor will execute the instructions rather than copy them to the TGax Draft.***

**9.4.2.218 HE Capabilities element**

 **9.4.2.218.2 HE MAC Capabilities Information field**

***TGax Editor: Add one-bit RX Control Frame to MultiBSS Figure 9-589ck—HE MAC Capabilities Information field format.***

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 | B3 B4 | B5 B7 | B8 B9 | B10 B11 | B12      B14 |
|  | +HTC HE Support | TWT Requester Support | TWT Responder Support | Fragmentation Support | Maximum Number of Fragmented MSDUs | Minimum Fragment Size | Trigger Frame MAC Padding Duration | Multi-TID Aggregation Support |
| Bits: | 1 | 1 | 1 | 2 | 3 | 2 | 2 | 3(#1589) |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B15     B16 | B17 | B18 | B19 | B20 | B21 | B22 | B23 | B24 |
|  | HE Link Adaptation | All Ack Support | UL MU Response Scheduling Support | A-BSR Support | Broadcast TWT Support | 32-bit BA Bitmap Support | MU Cascade Support | Ack-Enabled Multi-TID Aggregation Support | Group Addressed Multi-STA BlockAck In DL MU Support |
| Bits: | 2 | 1 | 1(#1) | 1(#824) | 1 | 1 | 1 | 1 | 4 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B25 | B26 | B27    B28 | B29 | B30    B31 | B32 | B33  B39 |
|  | OMI A-Control Support | OFDMA RA Support | Maximum A-MPDU Length Exponent | Downlink MU-MIMO on Partial Bandwidth Rx | UL MU-MIMO | RX Control Frame to MultiBSS | Reserved |
| Bits: | 1 | 1(#Ed) | 2(#2258) | 1 | 2 | 1 | 7(#Ed) |
|  | * HE MAC Capabilities Information field format
 |

**TGax Editor: *Add the following row in Table 9-262z—Subfields of the HE MAC Capabilities Information field:***

|  |  |  |
| --- | --- | --- |
| RX Control Frame to MultiBSS | Indicates whether the non-AP STA when associated with a BSS corresponding to a nontransmitted BSSID ~~to~~ supports reception of control frame with TA equal to transmitted BSSID | Set to 1 if supported.Set to 0 otherwise. |

**9.4.2.219 HE Operation element**

***TGax Editor: Add three-bit MaxBSSID Indicator field and 1-bit Tx BSSID Indicator to HE Operation Parameters field.***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0         B5 | B6         B8 | B9 | B10     B19 | B20 | B21 B23  | B24 | B25      B31 |
|  | BSS Color | Default PE Duration | TWT Required | HE Duration Based RTS Threshold | Partial BSS Color | MaxBSSID Indicator | Tx BSSID Indicator | Reserved |
| Bits: | 6(#244) | 3(#1) | 1(#667) | 10(#576) | 1 | 3 | 1 | 7(#Ed) |
| * HE Operation Parameters(#1350) field format
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|  |  |  |

***TGax Editor: Add the following paragraph to subclause 9.4.2.219:***

An HE AP corresponds to a nontransmitted BSSID if the AP’s BSSID can be derived from Multiple BSSID element present in the Beacon or Probe Response frame transmitted by another AP (i.e., the AP identified by the Transmitted BSSID). The Tx BSSID Indicator indicates whether an HE AP corresponds to transmitted BSSID. The definition of MaxBSSID Indicator is same as the MaxBSSID Indicator in Multiple BSSID element. An HE AP corresponding to a nontransmitted BSSID sets Tx BSSID Indicator to 0. An HE AP corresponding to a transmitted BSSID sets Tx BSSID Indicator to 1. An HE AP corresponding to Nontransmitted BSSID or a transmitted BSSID sets the MaxBSSID Indicator fieldto non-zero value.An AP corresponding to neither a nontransmitted BSSID nor a transmitted BSSID sets both MaxBSSID Indicator and Tx BSSID Indicator to 0.

**11.1.3.8 Multiple BSSID procedure**

 ***TGax Editor: Add the following paragraghes to subclause 11.1.3.8***

The AP corresponding to the transmitted BSSID transmits Beacon and Probe Response frames carrying Multiple BSSID element. In an HE AP device that operates with multiple BSSIDs, there shall not be more than one AP corresponding to the transmitted BSSID. An HE AP shall set MaxBSSID Indicator and Tx BSSID Indicator as defined in subclause 9.4.2.219.

An HE AP corresponding to a Nontransmitted BSSID shall set the the MaxBSSID Indicator fieldin HE Operation element to non-zero value. An HE STA that associates with the HE AP whose MaxBSSID Indicator fieldis set to n and whose Tx BSSID Indicator is set to 0 shall decodes the Beacon with Multiple BSSID element whose 48-n MSB of BSSID are same as the 48-n MSB of BSSID of the AP with which the STA is associated.

**9.3.1.9 BlockAck frame format**

**9.3.1.9.1 Overview**

***TGax Editor: Change the 3rd paragraph as follows:***

The RA field of the BlockAck frame that is not a Multi-STA BlockAck variant(#Ed) is the TA of the soliciting frame or the address of the recipient STA whose data/management frames are acknowledged. An HE AP that transmits a Multi-STA BlockAck frame with different values of the AID subfield in Per STA Info subfields sets the RA field to the broadcast address. An HE AP that transmits a Multi-STA BlockAck frame with a single AID subfield or with the same values of the AID subfield in Per STA Info subfields sets the RA field to the address of the recipient STA that requested the Block Ack or to the broadcast address. An HE non-AP STA transmits a Multi-STA BlockAck frame with a single AID subfield or with the same values of the AID subfield in Per STA Info subfields and sets the RA field to the TA of the soliciting frame or the address of the recipient STA whose data/management frames are acknowledged.(#2212)

**9.7.3 A-MPDU Content**

***TGax Editor: Change the 3rd paragraph as follows:***

All of the MPDUs within an A-MPDU are addressed to the same RA. All of the MPDUs within an A-MPDU are set with the same TA. All QoS Data frames within an A-MPDU that have a TID for which an HT-immediate block ack agreement exists have the same value for the Ack Policy subfield of the QoS Control field.

***TGax Editor: Insert the following paragraph:***

An A-MPDU carried in an(#2829) HE MU PPDU may include MPDUs with different values of the TID field. Additional rules about A-MPDU with multiple TIDs among HE STAs are defined in subclause 25.10.

**25.5.2.2.2 Allowed settings of the Trigger frame fields**

***TGax Editor: Change the 2nd paragraph as follows:***

If an HE AP doesn’t receives HE Capabilities with RX Control Frame to MultiBSS being set to 1 from a STA, the HE AP shall not send a Trigger frame whose destinating STAs associate with more than one APs to the STA. The RA field of the frames in response of a MU-RTS are defined in subcaluse 9.3.1.3. The RA field of the MPDUs in response of a MU-BAR are defined in subcaluse 9.3.1.9. BlockAck frame and Data frames whose RAs are different shall not be aggregated in one A-MPDU in responding to MU-BAR. The RA field of the data frames and management frames sent in response to a Trigger frame shall be set to the MAC address of the destination AP.(#171)

**25.4 Block acknowledgement**

**25.4.1 Overview**

***TGax Editor: Add the following paragraghes to the end of subclause 25.4.1:***

If an HE AP doesn’t receives HE Capabilities with RX Control Frame to MultiBSS being set to 1 from a STA, the HE AP shall not send a Multi-STA Block Ack frame whose destinating STAs associate with more than one APs to the STA.

An HE non-AP STA that is associated with a Nontransmitted BSSID and has indicated support for receiving Control frames with TA set to the Transmitted BSSID (RX Control Frame to MultiBSS set to 1 in HE Capabilities element), shall respond with a BlockAck frame whose RA is set either to the (Nontransmitted) BSSID it is associated with or the Transmitted BSSID (i.e., TA of the soliciting MU BAR frame).

**25.6 HE sounding protocol**

***TGax Editor: Add the following paragragh to subclause 25.6:***

If an HE AP doesn’t receives HE Capabilities with RX Control Frame to MultiBSS being set to 1 from a STA, the HE AP shall not send a NDP Announcement frame whose destinating STAs associate with more than one APs to the STA.