IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Resolution for CIDs related to Multiple BSSID | | | | |
| Date: May 2, 2019 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Abhishek Patil | Qualcomm Inc. |  |  | appatil@qti.qualcomm.com |
| Alfred Asterjadhi | Qualcomm Inc. |  |  | aasterja@qti.qualcomm.com |
| George Cherian | Qualcomm Inc. |  |  | gcherian@qti.qualcomm.com |

Abstract

This submission proposes resolutions for comments received for TGax LB238 (15):

20249, 20880, 20455, 20018, 20021, 20438, 21127, 20439, 21075, 21076, 20069, 20071, 20582, 20315, 20933

Revisions:

* Rev 0: Initial version of the document.

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.***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Pg/Ln** | **Section** | **Comment** | **Proposed Change** | **Resolution** |
| 20249 | Jarkko Kneckt | 37.18 | 3.2 | Please add Reduced Neighbor Report element as elements from which the Nontransmitted BSSID information can be received. | Change to: ... encoded in Probe Response, Beacon and directional multi-gigabit (DMG) Beacon frames and in Reduced Neighbor Report and Neighbor Report elements. | **Reject**  Per the definition, the (nontransmitted) BSSID is derived from information carried in the Probe or Beacon of a transmitted BSSID. The RNR IE can advertise information (e.g., BSSID, SSID etc) about a nonTxBSSID. The BSSID if present is explicitly provided not derived from the TxBSSID – i.e., RNR doesn’t carry the Multiple BSSID element (which aids the derivation of the nonTxBSSID – see 9.4.2.45). |
| 20880 | Mark RISON | 37.60 | 3.2 | The broadcast resource unit definition does not cover the case of one STA in each of more than one BSS in a multiple BSSID set | As it says in the comment | **Revised**  Updated the definition of broadcast RU to include the case of STAs associated with any BSS in a multiple BSSID set.  **TGax editor, please implement the changes shown in doc 11-19/506r0 with the tag 20880** |
| 20455 | Mark Hamilton | 148.42 | 9.4.2.45 | Don't need to qualify Multiple BSSID element behavior based on dot11MultiBSSIDImplemented, since it must be true for any device formatting this element. | Delete "If dot11MultiBSSIDImplemented is true," in the NOTE | **Revised**  Agree with the comment. Since this element and clause is applicable to multiple BSSID set, the note doesn’t need to call out the corresponding MIB value. The text was reorganized to match the recent changes made to baseline spec. The paragraph is split so that the note appears in the correct location.  **TGax editor, please implement the changes shown in doc 11-19/506r0 with the tag 20455** |
| 20018 | Abhishek Patil | 149.10 | 9.4.2.45 | Like (V)HT/HE Capabilities element, the HE Extended Capabilities element is common to all BSSIDs in a multiple BSSID set. | Add HE Extended Capabilities the list. | **Accept**  **TGax editor, please implement the changes as suggested by the commenter** |
| 20021 | Abhishek Patil | 154.24 | 9.4.2.170.2 | What is the need to have two fields to signal if the reported AP is a nonTxBSSID in a multiple BSSID set? A single bit is sufficient. | Mark B2 as reserved and delete the paragraph descibing the Multiple BSSID subfield. Rename B3 to Nontransmitted BSSID and replace the description for Transmitted BSSID subfield with the following: "When the Nontransmitted subfield is set to 1, it indicates the reported AP is a nontransmitted BSSID in a multiple BSSID set. Otherwise the subfield is set to 0 to indicate that the reported AP is either a single BSS AP or a transmitted BSSID in a multiple BSSID set." Replace the paragraph starting on P433L46 in clause 26.17.2.4 with: "If the 6 GHz AP reported in a TBTT Information field in a Reduced Neighbor Report is not part of a multiple BSSID set or is the transmitted BSSID in a multiple BSSID set, then the BSS Parameters subfield shall be included with the Nontransmitted BSSID subfield set to 0. If the 6 GHz AP reported in a TBTT Information field in a Reduced Neighbor Report is the nontransmitted BSSID in a multiple BSSID set, then the BSS Parameters subfield shall be included with the Nontransmitted BSSID subfield set to 1. Note: A non-AP STA scanning on the 6GHz channel can identify the transmitted BSSID based on the Beacon frame that carried Multiple BSSID element with the value n in the MaxBSSID Indicator field such that 48-n bits (BSSID[0:(47-n)]) is the same as the reported nontransmitted BSSID." | **Accept**  **TGax editor, please implement the changes as suggested by the commenter** |
| 20438 | Mark Hamilton | 187.61 | 9.4.2.243 | An AP that is doing multi-BSSID does not set the Co-Hosted BSS subfield to 1. | Add "but is advertising information using its own Beacon or Probe Response frames," after "at least one other BSS" | **Revised**  Updated the description of Co-Hosted subfield to mention that the AP advertises its information in it’s own beacon/probes. Added further clarification that an AP with dot11MultBSSIDImplemented set to true sets the subfield to 0.  **TGax editor, please implement the changes shown in doc 11-19/506r0 with the tag 20438** |
| 21127 | Pascal VIGER | 274.55 | 11.1.3.8 | The sentence is unclear: "If any of the elements...are not present in a nontransmitted BSSID profile, the corresponding values are the element values of the transmitted BSSID...". | Propose to clarify the term 'corresponding values', such as: " the values to use for the nontransmitted BSSID are values of corresponding element of the transmitted BSSID" | **Accept**  **TGax editor, please implement the changes as suggested by the commenter** |
| 20439 | Mark Hamilton | 438.52 | 26.17.7 | Only HE APs have an HE Operation element in which to set the Co-Hosted BSSID subfield. | Add "HE" to the start of the first sentence of 26.17.7 | **Accept**  **TGax editor, please implement the changes as suggested by the commenter** |

* Definitions specific to IEEE 802.11

***TGax Editor: Please update the definition of broadcast resource unit (RU) as shown below:***

**broadcast resource unit (RU):** a resource unit in a high efficiency (HE) multi-user (MU) physical layer (PHY) protocol data unit (PPDU) transmitted by an AP that is intended for either unassociated STAs or more than one associated STA in the BSS or in any of the other BSSs in the multiple BSSID set to which the AP’s BSS belongs.[20880]

* **Multiple BSSID element**

***TGax Editor: Please split the 3rd paragraph in this clause (baseline spec) and add the NOTE after the 1st sentence as shown below:***

***Update the 3rd paragraph as shown below:***

The MaxBSSID Indicator field contains a value assigned to *n*, where 2*n* is the maximum number of BSSIDs in the multiple BSSID set, including the reference BSSID (see 11.10.14 (Multiple BSSID set)).

[20455]

The actual number of BSSIDs in the multiple BSSID set is not explicitly signaled. The BSSID(i) value corresponding to the ith BSSID in the multiple BSSID set is derived from a reference BSSID (REF\_BSSID) as follows:

* HE Operation element

***TGax Editor: Please update the following paragraph in this clause shown below:***

The Co-Hosted BSS subfield is set to 1 to indicate that the AP transmitting this element shares the same operating class, channel and antenna connectors with at least one other BSS and is providing its BSS information by transmitting its own Beacon and Probe Response frames. Otherwise the subfield is set to 0. An AP operating in the 6 GHz band, a TDLS STA, an IBSS STA, a mesh STA or an AP with dot11MultiBSSImplemented set to true transmitting this element sets the subfield to 0.[20438]

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Pg/Ln** | **Section** | **Comment** | **Proposed Change** | **Resolution** |
| 21075 | Matthew Fischer | 371.01 | 26.8.3.1 | There is something funny both grammatically and semantically in the first sentence of this paragraph. | Not certain how to fix the sentence, although I believe that the paragraph would be just fine if the first sentence were simply deleted. But maybe that is incorrect, as perhaps, this first sentence is saying that the transmitted BSSID beacon might be able to contain multiple TWT elements for more than one BSS. If so, it is unclear how each of them is distinguished becuase there is only one BSSID reference in that beacon, so again, maybe deleting is ok. The next paragraph sort of confirms this. | **Revised**  Agree with the comment that the paragraph is not need as clause 11.1.3.8 covers the inheritance aspect in multiple BSSID set. The cited paragraph is deleted. Clause 11.1.3.8 is updated to include sub-clauses focused on a specific feature within multiple BSSID concept. This makes referencing easy. The reference to inheritance is updated to point to the specific sub-clause in 11.1.3.8. Same changes were applied to UORA and NFRP case.  **TGax editor, please implement the changes shown in doc 11-19/506r0 with the tag 21075** |
| 21076 | Matthew Fischer | 371.05 | 26.8.3.1 | Might be helpful to name the multi bssid procedure subclause | Add a reference to 11.1.3.8 (Multiple BSSID procedure) | **Revised**  The cited paragraph is deleted as a resolution to CID 21075. A reference to sub-clause on inheritance (11.1.3.8.4) is added to the paragraph that discusses advertisement of parameter set and inheritance by non-AP STAs. Same changes were applied to UORA and NFRP case.  **TGax editor, please implement the changes shown in doc 11-19/506r0 with the tag 21076** |
| 20069 | Abhishek Patil | 424.31 | 26.14.3.1 | Baseline spec requires that STAs that are multiple BSSID capable must be capable of decoding PVB in TIM element encoded as Method B. Further it requires that an AP that determines that all recipients are capable, it must encode with Method B. In case of TIM carried in FD frame, all the recipients are OPS capable HE STAs (i.e., support multiple BSSID). | Add an informative note that PVB in a TIM element carried in FILS Discovery frame or OPS frame is encoded as Method B per the rules in 9.4.2.5.1. | **Revised**  As pointed by the comment, per baseline spec (clause 9.4.2.5.1), a STA that supports multiple BSSID feature shall be capable of reconstructing the TIM bitmap encoded as Method B. The spec further requires that when an AP determines that all the recipients support multiple BSSID, it encodes the TIM using Method B (which is more efficient). Added a NOTE at the end of sub-clause on traffic advertisement which says that when TIM element is carried in an HE Beacon, HE ER Beacon, FD or OPS frame, the recipients are all HE STAs and hence the AP encodes the bitmap using Method B.  **TGax editor, please implement the changes shown in doc 11-19/506r0 with the tag 20069** |
| 20071 | Abhishek Patil | 424.34 | 26.15.6 | Baseline spec requires that STAs that are multiple BSSID capable must be capable of decoding PVB in TIM element encoded as Method B. Further it requires that an AP that determines that all recipients are capable, it must encode with Method B. | Add an informative note that PVB in a TIM element carried in an HE Beacon is encoded as method B per the rules in 9.4.2.5.1. Add similar note for ER Beacon | **Revised**  A NOTE is added at the end of sub-clause on traffic advertisement which says that when TIM element is carried in an HE Beacon, HE ER Beacon, FD or OPS frame, the recipients are all HE STAs and hence the AP encodes the bitmap using Method B.  Also see resolution for CID 20069.  **TGax editor, please implement the changes shown in doc 11-19/506r0 with the tag 20071** |

* **General**[21075, 21076]

***TGax Editor: Please update the 2nd, 5th & 6th paragraph in this clause shown below:***

A TWT scheduling AP includes a broadcast TWT element in the Beacon frame as described in 26.8.3.2 (Rules for TWT scheduling AP). An AP corresponding to a nontransmitted BSSID in a multiple BSSID set shall follow the rules in 11.1.3.8.4 (Inheritance of element values).

A non-AP HE STA shall obtain TWT parameter values from the most recently received TWT element carried in a Beacon, Probe Response, or (Re)Association Response frame from its associated AP unless the non-AP HE STA is associated with a nontransmitted BSSID of a multiple BSSID set, in which case it shall follow the rules in 11.1.3.8.4 (Inheritance of element values) to determine the TWT parameter values.(19/0028r4)

* General[21075, 21076]

***TGax Editor: Please update the 6th, 7th & 8th paragraph in this clause shown below:***

The HE AP may include the UORA Parameter Set element (see 9.4.2.244 (UL OFDMA-based Random Access (UORA) Parameter Set element) in Management frames that it transmits. The AP shall indicate the range of OFDMA contention window (OCW) in the UORA Parameter Set element for non-AP STAs(#16592) to initiate random access following the Trigger frame transmission. An AP corresponding to a nontransmitted BSSID in a multiple BSSID set shall follow the rules in 11.1.3.8.4 (Inheritance of element values).

NOTE—An AP with dot11MultiBSSIDImplemented(19/0028r4) set to true can allocate RA-RUs to non-AP STAs associated with different BSSIDs in the set by transmitting a DL MU PPDU carrying BSS specific broadcast RUs (see 26.5.1.2 (RU addressing in an HE MU PPDU)) with an A-MPDU in each RU carrying a Trigger frame with at least one User Info field with the AID12 set to 0.(#16540)(18/1812r2)

A non-AP HE STA(#16592) shall maintain an internal OCW and an internal OBO counter. OCW is an integer in the range *OCWmin* to *OCWmax*. A non-AP HE STA shall obtain *OCWmin* and *OCWmax* from the most recently received UORA Parameter Set element carried in a Beacon, Probe Response or (Re)Association frame transmitted by its associated AP unless the non-AP HE STA is associated with a nontransmitted BSSID of a multiple BSSID set, in which case it shall determine *OCWmin* and *OCWmax* by following the rules in 11.1.3.8.4 (Inheritance of element values).(19/0028r4)

* STA behavior[21075, 21076]

***TGax Editor: Please update the following paragraph in this clause shown below:***

A non-AP STA shall obtain NDP feedback report parameter values from the most recently received NDP Feedback Report Parameter Set element carried in a Beacon, Probe Response, or (Re)Association Response frame from its associated AP unless the non-AP STA is associated with a nontransmitted BSSID of a multiple BSSID set, in which case it shall follow the rules in 11.1.3.8.4 (Inheritance of element values) to determine the NDP feedback parameter values. If the NDP Feedback Report Parameter Set element is not received in a Management frame with a TA equal to the BSSID of the associated AP or to the transmitted BSSID of the multiple BSSID set, the non-AP STA shall use default values for the NDP Feedback Report parameters.

* **Multiple BSSID procedure**[21075, 21076]

***TGax Editor: Please update this clause shown below:***

***Change the 1st paragraph as follows:***

**11.1.3.8.1 General**

A STA that supports the Multiple BSSID capability has dot11MultiBSSIDImplemented equal to true and shall set to 1 the Multiple BSSID field of the Extended Capabilities elements that it transmits. Support for the Multiple BSSID capability is mandatory for a FILS STA and non-AP HE STA. An AP that supports enhancements related to the discovery and advertisement of a nontransmitted BSSID shall set the Enhanced Multi-BSSID Advertisement Support bit in the Extended Capabilities element to 1 and is referred to as an EMA AP. An AP operating on the 6 GHz band with dot11MultiBSSIDImplemented set to true and advertising a partial list of nontransmitted BSSID profiles shall operate as an EMA AP. When an AP not operating on 6 GHz band with dot11MultiBSSIDImplemented set to true and advertising a partial list of nontransmitted BSSID profiles wants a non-AP STA to discover the complete list of nontransmitted BSSID profiles, where a complete list of nontransmitted BSSID profile comprises of BSSIDs that are discoverable, the AP shall operate as an EMA AP.

***Replace the 2nd paragraph with the following:***

An AP with dot11MultiBSSIDImplemented equal to true does not belong to a co-hosted BSSID set (see 26.17.7 (Co-hosted BSSID set)) and shall not set the Co-Hosted BSS subfield in HE Operation element to 1 in the Management frames that it transmits.

The BSSID of the AP belonging to a multiple BSSID set is referred to as the transmitted BSSID if the AP includes the Multiple BSSID element in the Beacon frame that it transmits. In a multiple BSSID set, there shall not be more than one AP corresponding to the transmitted BSSID. The BSSID of an AP belonging to a multiple BSSID set is a nontransmitted BSSID if the AP's BSSID is derived according to 9.4.2.45 (Multiple BSSID element) and 9.4.2.73 (Multiple BSSID-Index element). Among all AP STAs in multiple BSSID set, only the AP corresponding to the transmitted BSSID shall transmit a Beacon frame.

**11.1.3.8.2 Nontransmitted BSSID profile**

A nontransmitted BSSID profile represents information about a particular nontransmitted BSSID and consists of a set of elements that are carried in one or more Nontransmitted BSSID Profile subelements across one or more multiple BSSID elements in the same frame. Each nontransmitted BSSID profile, at a minimum, shall include the elements that are mandatory for that BSS (i.e., Nontransmitted BSSID Capability element (see 9.4.2.71 (Nontransmitted BSSID Capability element)), SSID element (see 9.4.2.2 (SSID element)), Multiple BSSID-Index element (see 9.4.2.73 (Multiple BSSID-Index element)), and the Non-Inheritance element as described in 9.4.2.45 (Multiple BSSID element).

A nontransmitted BSSID profile consists of all elements carried in all such Multiple BSSID elements sharing the same BSSID index. An AP shall not carry a nontransmitted BSSID profile across multiple Multiple BSSID elements in a frame unless the nontransmitted BSSID profile cannot be carried in one multiple BSSID element due to the size limit of the multiple BSSID element.

If there is a need to split a nontransmitted BSSID profile across more than one Multiple BSSID element in a frame, an AP shall not split an element in the profile into multiple Multiple BSSID elements, and it shall place the next element in the nontransmitted BSSID profile as the first element in the first nontransmitted BSSID profile subelement of the immediately following Multiple BSSID element.

An example of a nontransmitted BSSID profile split across two Multiple BSSID elements in a frame is shown in Figure 11-3a (Example of a split nontransmitted BSSID profile).

|  |
| --- |
|  |
| * **Example of a split nontransmitted BSSID profile** |

NOTE—As described in 9.4.3 (Subelements), the Length field of the nontransmitted BSSID profile subelement indicates the number of octets only in the Data field of the nontransmitted BSSID profile subelement.

**11.1.3.8.3 Discovery of a Nontransmitted BSSID profile**

An AP or PCP may choose to include only a partial list of nontransmitted BSSID profiles in the Beacon frame, S1G Beacon frame or DMG Beacon frame or to include different sets of nontransmitted BSSID profiles in different Beacon frames, S1G Beacon frames or DMG Beacon frames. An AP corresponding to the transmitted BSSID may choose to include only a partial list of nontransmitted BSSID profiles in an unsolicited broadcast Probe Response frame or a Probe Response frame sent in response to a Probe Request frame with Address 3 field set to wildcard BSSID and SSID set to wildcard. An AP advertising a complete list of nontransmitted BSSID profiles shall set the Complete List Of NonTxBSSID Profiles field of Extended Capabilities element to 1.

An EMA AP advertising a partial list of BSSID profiles, shall include the Multiple BSSID Configuration element (see 9.4.2.237 (Active BSSID Count Multiple BSSID Configuration element)) in its Beacon frame, S1G Beacon frame, or DMG Beacon frame and shall include the Multiple BSSID Configuration element in any Probe Response frame it sends. This is done to indicate the configuration of the multiple BSSID set.

The BSSID Count field of the Multiple BSSID Configuration element indicates number of active BSSIDs in the multiple BSSID set while the Profile Periodicity field indicates the number of beacons a scanning STA is required to receive in order to discover all the active nontransmitted BSSIDs in the set. An AP corresponding to the transmitted BSSID shall send a Probe Response frame by following the rules in 11.1.4.3.4 (Criteria for sending a response), carrying Multiple BSSID element that includes, at a minimum, the nontransmitted BSSID profiles requested by the soliciting Probe Request frame.

[move without any change]

An unassociated non-AP STA may send a directed Probe Request frame containing a Known BSSID element (see 9.4.2.253 (Known BSSID element)) to an EMA AP that advertises partial list of nontransmitted BSSID profiles to gather information on nontransmitted BSSIDs it has not discovered. An EMA AP, when transmitting a Probe Response frame in response to a Probe Request frame containing Known BSSID element, should not include the nontransmitted BSSID profiles for BSSIDs listed in the Known BSSID element and shall, at a minimum, include the nontransmitted BSSID profiles requested by the soliciting Probe Request frame.

An EMA AP that includes a partial list of nontransmitted BSSID profiles in its Beacon frame, S1G Beacon frame, or DMG Beacon frame, shall advertise a particular nontransmitted BSSID profile in a repeating pattern such that the profile is present in at least one beacon in a sequence of beacons indicated by the Profile Periodicity field of the Multiple BSSID Configuration element unless the membership of the multiple BSSID set changes. If there is a change in a particular nontransmitted BSSID's profile (i.e., set of elements belong to the profile or the element values), the EMA AP shall include the profile in the next DTIM beacon of that BSS so that STAs with that BSS become aware of the change immediately.

NOTE—It is recommended that an AP selects the periodicity in which the profile repeats to be a multiple of the BSS's DTIM interval so that associated STAs in PS mode don't have to wake for additional beacons.

***Change the 4th paragraph as follows:***

**11.1.3.8.4 Inheritance of element values**

~~When a station receives a Beacon frame or DMG Beacon frame with a Multiple BSSID element that consists of a nontransmitted BSSID profile with only the mandatory elements, it may inherit the complete profile from a previously received Beacon frame, DMG Beacon frame, or Probe Response frame, or it may send a Probe Request frame to obtain the complete BSSID profiles. Each Beacon element not transmitted in a nontransmitted BSSID subelement is inherited from previous Beacon, DMG Beacon, or Probe Response frame in which the element is present, except for the Quiet element, which shall take effect only in the Beacon frame or DMG Beacon frame that contains it and not carry forward as a part of the inheritance. An AP or PCP is not required to include all supported nontransmitted BSSID profiles in a Probe Response frame, and may choose to only include a subset based on any criteria.~~ When a nontransmitted BSSID profile is present in one or more Multiple BSSID element of a Probe Response frame or a Beacon frame, the AP or PCP shall include all elements that are specific to this BSS. An element is considered to be specific to a BSS if its value is different from the corresponding element advertised by the transmitted BSSID or if the nontransmitted BSSID satisfies the condition as specified in the Table 9-34 (Beacon frame body) for a non-DMG non-S1G AP or Table 9-47 (DMG Beacon frame body) for a DMG AP for that element to be present while the transmitted BSSID does not satisfy the corresponding condition. If any of the ~~optional~~ elements carried in the Probe Response frame, Beacon frame or DMG Beacon frame of the transmitted BSSID are not present in a nontransmitted BSSID profile, the corresponding values are the element values of the transmitted BSSID unless the element is listed in the Non-Inheritance element (if included) in the nontransmitted BSSID profile for that BSS.

***Change the 6th paragraph as follows:***

**11.1.3.8.5 Traffic advertisement in a multiple BSSID set**

The Partial Virtual Bitmap field of the TIM element carried in the Beacon, S1G Beacon, or DMG Beacon frame shall indicate the presence or absence of traffic to be delivered to all stations associated to a transmitted or nontransmitted BSSID. The first 2*n* bits of the bitmap are reserved for the indication of group addressed frame for the transmitted and all nontransmitted BSSIDs (see 9.4.2.5.1 (General)). The AID space is shared by all BSSs and the lowest AID value that shall be assigned to a non-S1G STA is 2*n* (see 9.4.2.5 (TIM element)). The decimal value of the 11 LSBs of the AID assigned to an S1G STA shall be greater than 2*n*. The Encoded Blocks that contain these first 2*n* AIDs (if any) shall precede the Encoded Blocks that contain AIDs for the S1G STAs in the S1G Partial Virtual Bitmap field of each page. Each BSS of the Multiple BSSID set may have a different DTIM interval which is signaled in the DTIM Period and DTIM Count fields that are present in the Multiple BSSID-Index element carried in the nontransmitted BSSID profile for that BSS. shall [move without any change]

NOTE – When all the recipients of the TIM element are STAs that support multiple BSSID capability, for example when the TIM element is carried in HE (ER) Beacon, FILS Discovery frame or OPS frame where all the addressees are non-AP HE STAs, the transmitting AP uses Method B to encode the Partial Virtual Bitmap and the Bitmap Control field of the TIM element.[20069, 20071]

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Pg/Ln** | **Section** | **Comment** | **Proposed Change** | **Resolution** |
| 20582 | Mark RISON | 313.27 | 26.4.1 | "An HE AP shall not send to the STA a Multi-STA BlockAck frame that has Per AID TID Info fields for STAs associated with more than one BSS in a multiple BSSID set unless the HE AP has received from the STA an HE Capabilities element with the Rx Control Frame To MultiBSS subfield in HE MAC Capabilities Information field set to 1." -- as Table 9-321a indicates, this only applies to STAs on nontransmitted BSSIDs | Add a "non-AP STA is associated with a non- transmitted BSSID" caveat, as in 26.2.6.3. Ditto "If all the recipient non-AP STAs that sent an HE TB PPDU have indicated support for receiving Control frames addressed to STAs from two or more BSSs of a multiple BSSID set by setting the Rx Control Frame To MultiBSS subfield in the HE Capabilities element to 1, the AP may respond with a Multi-STA BlockAck frame" at 321.11; "An AP shall not send a Trigger frame that is not an NFRP Trigger frame with User Info fields addressed to non-AP STAs from two or more BSSs of a multiple BSSID set to a non-AP STA unless the non-AP STA has set the Rx Control Frame To MultiBSS subfield in the HE MAC Capabilities Information field of the HE Capabilities element it transmits to 1." at 329.12; "An HE AP shall not send an HE NDP Announcement frame with STA Info fields that are addressed to STAs from two or more BSSs of a multiple BSSID set unless each of the addressed STAs has set the Rx Control Frame To MultiBSS subfield in the HE MAC Capabilities Information field of the HE Capabilities element it transmits to 1." at 360.42 | **Revised**  Agree with the commenter. The condition applies only for STAs associated with nonTxBSSID. The cited sentences were updated to add the condition that the STA is associated with a nonTxBSSID. Further editorial changes were made to improve readability.  **TGax editor, please implement the changes shown in doc 11-19/506r0 with the tag 20582** |
| 20315 | kaiying Lv | 313.28 | 26.4.1 | When a STA that transmits an HE Capabilities element with the Rx Control Frame To MultiBSS subfield in HE MAC CapabilitiesInformation field set to 0 is associated with the BSS with the transmitted BSSID, the AP can send to the STA a Multi-STA BlockAck frame that has Per AID TID Info fields for STAs associated with more than one BSS in a multiple BSSID set. | Change to "...unless the HE AP has received from the STA an HE Capabilities element with the Rx Control Frame To MultiBSS subfield in HE MAC Capabilitie Information field set to 1 or the STA is associated with the BSS with transmitted BSSID." | **Revised**  Agree with the commenter. The condition applies only for STAs associated with nonTxBSSID. The cited sentence and several others throughout the spec were updated to add the condition that the STA is associated with a nonTxBSSID. Further editorial changes were made to improve readability.  **TGax editor, please implement the changes shown in doc 11-19/506r0 with the tag 20315** |

* Overview

***TGax Editor: Please update the following paragraph in this clause shown below:***

[20582, 20315]An HE AP shall not send to a non-AP STA, that is associated with a nontransmitted BSSID in the multiple BSSID set, a Multi-STA BlockAck frame, containing Per AID TID Info fields for STAs associated with more than one BSS in the multiple BSSID set unless the AP has received from the STA an HE Capabilities element with the Rx Control Frame To MultiBSS subfield in HE MAC Capabilities Information field set to 1.

* Responding to an HE TB PPDU with an HE MU PPDU

***TGax Editor: Please update the following bullet in this clause shown below:***

* [20582, 20315]If all the recipient non-AP STAs, associated with a nontransmitted BSSID of a multiple BSSID set, that sent an HE TB PPDU have indicated support for receiving Control frames addressed to STAs from more than one BSS in a multiple BSSID set, by setting the Rx Control Frame To MultiBSS subfield in the HE Capabilities element to 1, the AP may respond with a Multi-STA BlockAck frame with RA field set to the broadcast address and carried in a DL HE MU PPDU. The Ack Type field and AID11 field of the Multi-STA BlockAck frame are set as described in 9.3.1.8.7 (Multi-STA BlockAck variant). The AP shall set the element of the TXVECTOR parameter STA\_ID\_LIST for the RU carrying the Multi-STA BlockAck frame to 2047. An AP shall not include more than one group addressed Multi-STA BlockAck frame in the A-MPDU carried in a broadcast RU in a DL HE MU PPDU.
* Allowed settings of the Trigger frame fields and TRS Control subfield

***TGax Editor: Please update the following paragraph in this clause shown below:***

[20582, 20315]An AP shall not send a Trigger frame that is not an NFRP Trigger frame with User Info fields addressed to non-AP STAs from more than one BSS in a multiple BSSID set to a non-AP STA that is associated with a nontransmitted BSSID in the multiple BSSID set unless the non-AP STA has set the Rx Control Frame To MultiBSS subfield in the HE MAC Capabilities Information field of the HE Capabilities element it transmits to 1. An AP may send an NFRP Trigger frame addressed to non-AP STAs from two or more BSSs in a multiple BSSID set.

* Rules for HE sounding protocol sequences

***TGax Editor: Please update the following paragraph in this clause shown below:***

[20582, 20315]An HE AP shall not send an HE NDP Announcement frame with STA Info fields that are addressed to STAs from more than one BSS in a multiple BSSID set to a non-AP STA that is associated with a nontransmitted BSSID in the multiple BSSID set unless the non-AP STA has set the Rx Control Frame To MultiBSS subfield in the HE MAC Capabilities Information field of the HE Capabilities element it transmits to 1.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Pg/Ln** | **Section** | **Comment** | | **Proposed Change** | **Resolution** |
| 20933 | Mark RISON | 321.00 | 26.4.4.6 | | "a BSS specific broadcast RU" -- this term is undefined | Delete " carried in a BSS spe- cific broadcast RU of a DL HE MU PPDU" at 321.8, " carried in a broadcast RU in a DL HE MU PPDU" at 321.20 and " BSS specific" at 343.35.  Also change "the AID12" to "the AID12 subfield" at 343.37 | **Revised**  Agree with the commenter that BSS specific broadcast RU can be ambiguous. Deleted the two sentences cited in 26.4.4.6 and replaced with a note. Clause 9.7.3 specifies that an A-MPDU can carry at most one BA (including group addressed Multi-STA BA). The NOTE in 26.5.4.1 is updated to improve readability and remove the term BSS specific broadcast RU  **TGax editor, please implement the changes shown in doc 11-19/506r0 with the tag 20933** |

* Responding to an HE TB PPDU with an HE MU PPDU

***TGax Editor: Please update the following paragraph in this clause shown below:***

An AP with dot11MultiBSSIDImplemented equal to true may do one of the following:

* For each BSS belonging to the multiple BSSID set for which the AP has received an HE TB PPDU, the AP responds with a Multi-STA BlockAck frame with RA field set to the broadcast address and carried in a DL HE MU PPDU. The Ack Type field and AID11 field of the Multi-STA BlockAck frame are set as described in 9.3.1.8.7 (Multi-STA BlockAck variant). The AP shall set the element of the TXVECTOR parameter STA\_ID\_LIST for the RU carrying the Multi-STA BlockAck frame to the value of the BSSID Index field as defined in 26.11.1 (STA\_ID\_LIST).[20933]
* If all the recipient non-AP STAs that sent an HE TB PPDU have indicated support for receiving Control frames addressed to STAs from two or more BSSs of a multiple BSSID set by setting the Rx Control Frame To MultiBSS subfield in the HE Capabilities element to 1, the AP may respond with a Multi-STA BlockAck frame with RA field set to the broadcast address and carried in a DL HE MU PPDU. The Ack Type field and AID11 field of the Multi-STA BlockAck frame are set as described in 9.3.1.8.7 (Multi-STA BlockAck variant). The AP shall set the element of the TXVECTOR parameter STA\_ID\_LIST for the RU carrying the Multi-STA BlockAck frame to 2047. [20933]

[20933]NOTE – An AP includes at most one Ack or BlockAck frame (group addressed Multi-STA BlockAck frame included) in an A-MPDU as specified in clause 9.7.3.

* UL OFDMA-based random access (UORA)
* General

***TGax Editor: Please update the following NOTE in this clause shown below:***

[20933]NOTE—An AP with dot11MultiBSSIDImplemented(19/0028r4) set to true can allocate RA-RUs for non-AP STAs associated with different BSSIDs in the multiple BSSID set by transmitting a DL MU PPDU carrying broadcast RUs one per BSS in the set (see 26.5.1.2 (RU addressing in an HE MU PPDU)) with an A-MPDU in each broadcast RU carrying a Trigger frame with at least one User Info field with the AID12 subfield set to 0.(#16540)(18/1812r2)