IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Multiple BSSID Clarification – Part 3 | | | | |
| Date: January 15, 2019 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Abhishek Patil | Qualcomm Inc. |  |  | appatil@qti.qualcomm.com |
| Alfred Asterjadhi |  |  |  |
| George Cherian |  |  |  |
| Jouni Marlinen |  |  |  |
| Po-Kai Huang | Intel Corp. |  |  |  |
| Thomas Derham | Broadcom Corp. |  |  |  |
| Ming Gan | Huawei |  |  |  |
| Wook Bong Lee | Samsung |  |  |  |

Abstract

There are no CIDs associated with the proposed changes in this document.

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Additional updates (based on offline feedback):
  + Includes rules for FD frame transmission in a multiple BSSID set
  + Clarify that an unsolicited probe response or a response solicited by wildcard probe request may have partial list of BSSIDs
  + Clarify that a response to a probe directed to a particular nonTxBSSID is required to include the profile of the nonTxBSSID.
  + Clarify that a response to a request indicating ‘known BSSIDs’ doesn’t include the profiles for known BSSID and is required to include the profile of the requested nonTxBSSIDs
  + Replaced mgmt. frames with the exact frames that carry the (TWT, UORA and NDP f/b) parameters.
  + Simplified the description of Rx Control Frame to Multi-BSS bit
* Rev 2: Updated based on feedback
  + Mandatory requirement for EMA applies to a multi-BSS 6 GHz AP
* Rev 3: Mandatory requirement for EMA applies to a multi-BSS 6 GHz AP that is advertising partial list of noTxBSSID
  + Changes marked in green

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** |
|  |  |  |  |  |  |  |

**Discussion:**

1. REVmd D2.0 has deleted the MIB variable dot11MultiBSSIDActived and replaced all references with dot11MultiBSSIDImplemented
2. Since support for multiple BSSID is mandatory for a non-AP HE STA, the change from #1 above, would simplify the description for certain situations.
   1. E.g., there is no need to say “A non-AP STA with dot11MultiBSSIDActivated set to true and associated with a nontransmitted BSSID…”
3. 11ax D3.3 has a couple of references to nontransmitting BSSID – there is no such thing as nontransmitting BSSID. This should be replaced with nontransmitted BSSID
4. 11ax D3.3 has inconsistent description of how STAs associated with nontransmitted BSSID obtain parameter values. Instead of repeating the text, which can lead to errors (or inconsistency in spec text), it is better to make reference to a single section (clause) 11.1.3.8 which covers inheritance.
5. In a multiple BSSID set, the TxBSSID sends a FILS Discovery frame.
6. Clarify that when a probe response is sent in response to a probe request directed to a particular nonTxBSSID, the multiple BSSID element carried in the response frame includes the profile of the requested nonTxBSSID.
7. Simplified the description of RX Control frame to Multi-BSS in HE MAC Cap

***TGax Editor: All section references are with respect to 11ax D3.3:***

***TGax Editor: Please replace all occurrences of dot11MultiBSSIDActivated with dot11MultiBSSIDImplemented in the 11ax spec***

* General

***TGax Editor: Please make the changes as shown below to the following paragraph in this section:***

A non-AP HE STA 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 one of the Beacon frame, Probe Response frame or (Re)Association Response frames 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 follow the rules described in 11.1.3.8 (Multiple BSSID Procedure) to determine the parameter values.

* General

***TGax Editor: Please make the changes as shown below to the following paragraph in this section:***

A non-AP HE STA shall obtain TWT parameter values from the most recently received TWT element carried in one of the Beacon frame, Probe Response frame or (Re)Association Response frames of 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 described in 11.1.3.8 (Multiple BSSID Procedure) to determine the parameter values.

* STA behavior

***TGax Editor: Please make the changes as shown below to the following paragraph in this section:***

A non-AP STA shall obtain NDP Feedback Report parameter values from the most recently received NDP Feedback Report Parameter Set element carried in one of the Beacon frame, Probe Response frame or (Re)Association Response frames received 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 described in 11.1.3.8 (Multiple BSSID Procedure) to determine the parameter values. If the NDP Feedback Report Parameter Set element is not received in a Management frame that has a TA whose value is 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.

* General

***TGax Editor: Please make the changes as shown below to the following paragraph in this section:***

An AP that transmits a PPDU may solicit an HE TB PPDU from one or more non-AP STAs through one of the following mechanisms:

* Including in the PPDU one or more Trigger frames that include one or more User Info fields with one of the following AID12 subfield settings:
* The AID12 subfield is set to the 12 LSBs of the AID of the non-AP STA if the User Info field is addressed to a STA that is associated with the AP.
* The AID12 subfield is set to the 12 LSBs of the AID of the non-AP STA if the User Info field is addressed to a STA that is associated with a nontransmitted BSSID in a multiple BSSID set that the AP belongs to, the TA field of the Trigger frame is set to the transmitted BSSID and the non-AP STA has set the Rx Control Frame To MultiBSS sub-field in the HE Capabilities element it transmits to 1.
* STA behavior

***TGax Editor: Please make the changes as shown below to the following paragraph in this section:***

A non-AP STA is scheduled to respond to the NFRP Trigger frame if all the following conditions are met:

* The non-AP STA is associated with the BSSID indicated in the TA field of the NFRP Trigger frame or the non-AP STA is associated with a nontransmitted BSSID of a multiple BSSID set and the TA field of the NFRP Trigger frame is set to the transmitted BSSID of that multiple BSSID set
* HE MAC Capabilities Information field

***TGax Editor: Please make the changes to the row in Table 9-321a as shown below:***

|  |  |  |  |
| --- | --- | --- | --- |
| * 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 supports reception of a control frame with TA field equal to the transmitted BSSID. | For a non-AP STA:  Set to 1 if supported.  Set to 0 otherwise.  Reserved for an AP. | |

* FILS Discovery frame transmission

***TGax Editor: Please add the following paragraph as the last paragraph in this section:***

Among all the AP STAs in a multiple BSSID set, only the AP corresponding to the transmitted BSSID may transmit a FILS Discovery frame. When dot11MultiBSSIDImplemented is true,

* the Address 1 field of the FILS Discovery frame shall be set to broadcast address
* the Address 2 field and the Address 3 field of the frame shall be set to the transmitted BSSID
* the SSID/Short SSID field shall be set to the SSID/Short SSID of the transmitted BSSID
* the FILS Capability field shall be present and the Multiple BSSIDs Presence Indicator subfield shall be set to 1
* Multiple BSSID procedure

***TGax Editor: Please modify the following paragraphs as shown below:***

Implementation of the Multiple BSSID capability is optional for a WNM STA and for a DMG STA. Implementation of the Multiple BSSID capability is mandatory for a FILS STA and non-AP HE STA. A STA that implements the Multiple BSSID capability has dot11MultiBSSIDImplemented equal to true. When dot11MultiBSSIDImplemented is true, dot11WirelessManagementImplemented shall be equal to true except for a DMG STA and an HE STA, in which case it may be equal to false. A STA in which dot11MultiBSSIDActivated is true is defined as a STA that supports the Multiple BSSID capability. The STA shall set to 1 the Multiple BSSID field of the Extended Capabilities elements that it transmits. 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 6 GHz band with dot11MultiBSSIDImplemented set to true and advertising a partial list of nontransmitted BSSID profiles shall operate as an EMA AP.

***TGax Editor: Please modify the following paragraphs as shown below:***

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, when advertising a partial list of BSSID profiles, shall include Multiple BSSID Configuration element (see 9.4.2.237 (Multiple BSSID Configuration element)) in its Beacon frame, S1G Beacon frame, DMG Beacon frame or Probe Response frame 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, carrying Multiple BSSID element which includes, at a minimum, the nontransmitted BSSID profiles requested by the soliciting Probe Request frame.

***TGax Editor: Please modify the following paragraphs as shown below:***

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.