IEEE P802.11  
Wireless LANs

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| Resolutions to CID 1287, 1288, 1300 | | | | |
| Date: August 23, 2018 | | | | |
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Abstract

This submission proposes resolutions for CIDs 1287, 1288 and 1300 received for TGm LB232

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Updated based on feedback received when the doc was presented during 7/31/18 Portland ad-hoc
* Rev 2: Updated to the definition of *dec*(A[b:c]) and *bin*[x,k] based on offline feedback

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| --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Pg / Ln** | **Section** | **Comment** | **Proposed Change** | **Resolution** |
| 1300 | Abhishek Patil | 857.34 | 9.4.1.25 | There are several sections of the spec that refer to portions of the MAC address (or BSSID) as MSB/LSB. This is confusing as MAC address/BSSID is a sequence of 48-bits. At times, the spec says I/G bit is the MSB in the address. This conflicts with the description in 802-2014 (clause 8 Fig 10) where it says I/G is bit 0 of the first octet. Please updates sections: 9.4.1.25 (P857L34), 9.4.2.21.10 (P996L29), 9.4.2.104 (P1183L1), 11.45.5.3 (P2305L20), 14.13.2.4.5 (P2612L1) and MIB references. | Please update the cited spec text to remove any references to MSB (or LSB) and instead use bit positions (e.g., MAC\_ADDR[0:47]) to describe (or operate on) the corresponding bits in the MAC address. | Revised  Agree with the comment.  **TGm editor please make changes as shown in doc 11-18/1350r2** |
| 1288 | Abhishek Patil | 1076.04 | 9.4.2.45 | Computing BSSID\_B involves an integer operation ("+I" and "modulo 2^n"). However, the description is in terms bit operations (... "and n LSBs equal to [(n LSBs of REF\_BSSID) +i] mod 2^n"). | Update the equation for derivation of BSSID(i) to include steps to convert the binary value to an integer and back to binary after the integer operations are performed | Revised  Agree with the comment.  **TGm editor please make changes as shown in doc 11-18/1350r2** |
| 1287 | Abhishek Patil | 1076.01 | 9.4.2.45 | The derivation of BSSID(i) makes references to MSB and LSB of a MAC address (BSSID). MAC address is a sequence of bits and it is confusing to refer to the bits in the address as MSB or LSB. It also conflicts with the description in clause 8 of 802-2014 spec (see Fig 10) which says that the I/G bit is bit 0 of the first octet. Per the derivation of BSSID(i), the BSSIDs in a multiple BSSID set would have the lower n-bits changing - this would mean the I/G bit is being affected - which is not the intention. Same comment for 11.10.14 | Please replace derivation of BSSID(i) so that it does not make reference to MSB/LSB and instead the operation is performed with respect to the bit positions (e.g., REF\_BSSID[(48-n) : 47]).  Please make appropriate changes to section 11.10.14 (P2105L25) | Revised  Agree with the comment.  **TGm editor please make changes as shown in doc 11-18/1350r2** |

This document uses REVmd draft 1.2 as the baseline.

* Terminology for mathematical, logical, and bit operations[#1300,1288]

***TGm Editor: Please add the following mathematical operators at the end of this section:***

*dec*(A[b:c]) is the cast from binary to decimal operator, where c is the least significant bit in binary value [b:c]

*bin*[x, k] is the operator that casts decimal value x into k bits binary vector, where x is less than 2k

* Conventions[#1300]

***TGm Editor: Please add the following two new paragraphs (and figures) after the 3rd paragraph in this section (REVmd D1.2, P749L57):***

MAC addresses are assigned as ordered sequences of bits. The Individual/Group bit is always transferred first and is bit 0 of the MAC address. Bit 47 of the MAC address is always transferred last. This is illustrated in Figure 9-0a (Representation of 48-bit MAC address). Also see clause 8 of IEEE 802-2014.

**TGm Editor: Visio file for Figure 9-0a: 11-18/1352r1**



Figure 9-0a – Representation of a 48-bit MAC address[#1300]

MAC\_ADDR[*b*:*c*] represent bits *b* to *c* inclusive of MAC address MAC\_ADDR.

* PSMP STA Info field[#1300]

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

The PSMP Group Address ID (B21 to B63) subfield contains MAC\_ADDR[5:47] of a 48 bit MAC address. Use of this subfield is described in 10.30.2.8 (PSMP group addressed transmission rules). B63 contains bit 47 of the group address.

* Multicast Diagnostics request[#1300]

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

A Group MAC Address field with bit 0 set to 1 contains the MAC address of the group addressed frames to which the measurement request relates. A Group MAC Address field with bit 0 set to 0 indicates that all group addressed frames, apart from the broadcast MAC address, are requested.

* Multicast Diagnostics report[#1300]

***TGm Editor: Please make the changes as shown below to the following two paragraphs in this section:***

When bit 0 of the Multicast MAC address field in the Multicast Diagnostics request is 1, the twelve LSBs of the First Sequence Number field contain the sequence number of the first frame received with destination address equal to the value in the Multicast MAC address field during the measurement period. When bit 0 of the Multicast MAC address field in the Multicast Diagnostics request is 0, the twelve LSBs of the First Sequence Number field contain the sequence number of the first group addressed frame, that does not have the broadcast MAC address as its destination, received during the measurement period. The four most significant bits of the First Sequence Number field are set to 0.

When bit 0 of the Multicast MAC address field in the Multicast Diagnostics request is 1, the twelve LSBs of the Last Sequence Number field contain the sequence number of the last frame received with destination address equal to the value in the Multicast MAC address field during the measurement period. When bit 0 of the Multicast MAC address field in the Multicast Diagnostics request is 0, the twelve LSBs of the Last Sequence Number field contain the sequence number of the last group addressed frame, that does not have the broadcast MAC address as its destination, received during the measurement period. The four most significant bits of the Last Sequence Number field are set to 0.

* Beacon Timing element

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

The Neighbor STA ID subfield is an unsigned integer that indicates the identification of the neighbor STA corresponding to this beacon timing information. When a mesh peering is established with this neighbor STA, the MSB of this field is set to 0, and the rest of this field is set to the last 7 digits (7 LSBs) of the AID value assigned to this neighbor mesh STA. When a mesh peering is not established with this neighbor STA, the MSB of this field is set to 1, and the rest of this field is set to MAC\_ADDR[42:47] of the 48-bit MAC address of this neighbor STA.[#1300]

* Concealment of GCR transmissions[#1300]

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

The Individual/Group Address bit (bit 0) of dot11GCRConcealmentAddress shall be set to 1.

* Non-AP STA procedures for differentiated initial link setup[#1300]

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

If a MAC Address Filter field is present, the non-AP STA shall compare its MAC address to the Bit Pattern subfield in the MAC Address Filter field. If the value of the last MAC\_ADDR[(47-*n*+1) : 47] bits of the non-AP STA’s MAC address matches the value of the bits used for MAC address filtering in the Bit Pattern subfield, where *n* is specified in the Bit Pattern Length subfield, the MAC address condition is satisfied.

* General[#1300]

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

In an infrastructure BSS, the IEEE 802.1X Authenticator MAC address (AA) and the AP’s MAC address are the same, and the Supplicant’s MAC address (SPA) and the STA’s MAC address are equal. For the purposes of comparison, the MAC address is encoded as 6 octets, taken to represent an unsigned integer. The first octet of the MAC address shall be used as the most significant octet. The bit numbering conventions in 9.2.2 (Conventions) shall be used within each octet. This results in a sequence of 48 bits represented such that bit 0 is the first transmitted bit (Individual/Group bit) and bit 47 is the last transmitted bit.

* Receiver’s procedure

***TGm Editor: Please make the changes as shown below to the 4th paragraph in this section (REVmd D1.2, P2744L58):***

A mesh STA can also check if its neighbor mesh STAs received its Beacon frame successfully by checking whether the Beacon Timing elements received from its neighbor mesh STAs contain beacon timing information of the mesh STA. When the Beacon Timing element is received from one of the peer mesh STAs, the mesh STA checks if the MSB of the Neighbor STA ID subfield is set to 0 and the rest of the field matches with the 7 LSBs of the AID value assigned to the mesh STA through the mesh peering establishment. When the Beacon Timing element is received from a nonpeer mesh STA, the mesh STA checks if the MSB of the Neighbor STA ID subfield is set to 1 and the rest of the field matches with MAC\_ADDR[42:47] of its own MAC address. If the matching is verified, the corresponding beacon timing information represents the correct beacon reception by the neighbor mesh STA.[#1300]

* Group ID and partial AID in VHT and CMMG PPDUs[#1300,1288]

***TGm Editor: Please move the paragraph after Table 10-13 as the second paragraph of this section with the changes as shown below:***

, and subsequent discussion in this sectionthe 48-bit MAC address is represented such that 202c-b See Figure 9-0a (Representation of 48-bit MAC address).

***TGm Editor: Please make the following changes to Tables 10-12 as shown below:***

|  |  |  |
| --- | --- | --- |
| * **Settings for the TXVECTOR parameters GROUP\_ID and PARTIAL\_AID for VHT STAs** | | |
| **Condition** | **GROUP\_ID** | **PARTIAL\_AID** |
| Addressed to AP | 0 | *dec*(BSSID[39:47]) |
| Addressed to Mesh STA | 0 | *dec*(RA[39:47]) |
| Sent by an AP and addressed to a STA associated with that AP or  sent by a TDLS STA in a direct path to a TDLS peer STA | 63 | (AID + *dec*(BSSID[44:47] ⊕ BSSID[40:43]) x 25) mod 29 (10-12) |
|
| Otherwise (see NOTE) | 63 | 0 |
| NOTE—The last row covers the following cases:   * A PPDU sent to an IBSS STA * A PPDU sent by an AP to a non associated STA * Any other condition not explicitly listed elsewhere in the table | | |

***TGm Editor: Please make the following changes to Tables 10-13 as shown below:***

|  |  |
| --- | --- |
| * **Settings for the TXVECTOR parameter PARTIAL\_AID for CMMG STAs** | |
| **Condition** | **PARTIAL\_AID** |
| A frame that is not a Control frame that is addressed to an AP. |  |
| A frame that is not a Control frame that is addressed to an AP. |  |
| A frame that is not a Control frame that is sent by an AP and addressed to a STA associated with that AP or sent by a DLS or TDLS STA in a direct path to a DLS or TDLS peer STA. | (10-13) |
| Otherwise (see NOTE) | 0 |
| NOTE—The last row covers the following cases:   * A PPDU sent to an IBSS STA * A PPDU sent by an AP to a non associated STA * Any other condition not explicitly listed elsewhere in the table | |

***TGm Editor: Please delete the following paragraph as it is moved as the second paragraph in this section:***

* **Group ID, partial AID, Uplink Indication, and COLOR in S1G PPDUs**[#1300,1288]

***TGm Editor: Please fix typo (‘PARIAL’ should be ‘PARTIAL’) in the title for Tables 10-14 & 10-15 and propoagate the fix wherever the titles are referred to***

***TGm Editor: Please move the paragraph after Table 10-15 as the second paragraph of this section with the changes as shown below:***

T,T and subsequent discussion in this section

* the 48-bit MAC address is represented such that See Figure 9-0a (Representation of 48-bit MAC address).

***TGm Editor: Please make the following changes to Tables 10-14 & 10-15 as shown below:***

|  |  |
| --- | --- |
| * **Settings for the TXVECTOR parameter PARTIAL\_AID for NDP frames** | |
| **Condition** | **PARTIAL\_AID** |
| A frame that is addressed to an AP or sent by an AP as a broadcast address | (*dec*(BSSID[39:47]))*mod*(291) + 1 |
| A frame that is sent by an AP and addressed to a STA associated with that AP or sent by a TDLS STA in a direct path to a TDLS peer STA, or to a group of STAs with a common group AID and a common BSSID | (AID[0:8] + 25 × *dec*(BSSID[44:47] BSSID[40:43]))*mod* 29 |
| Otherwise | 0 |

|  |  |
| --- | --- |
| * **Settings for the TXVECTOR parameter PARTIAL\_AID for non-1 MHz PPDUs and non-NDP frames** | |
| **Condition** | **PARTIAL\_AID** |
| A frame that is not a Control frame that is addressed to an AP | *dec*(BSSID[39:47])*mod*(291)) + 1 |
| A frame that is not a Control frame that is sent by an AP and addressed to a STA associated with that AP or is sent by a TDLS STA in a direct path to a TDLS peer STA or is sent to a group of STAs with a common group AID and a common BSSID | (AID[0:8] + 25 × *dec*(BSSID[44:47] BSSID[40:43]))*mod* 26 |
| Otherwise | 0 |

***TGm Editor: Please delete the following paragraph as it is moved as the second paragraph in this section:***

***TGm Editor: Please make the following changes to the equation shown below in this section:***

0 or (*dec*(BSSID[39:47])*mod*(29 1)) + 1 or (*dec*(OBSSID[39:47])mod(29  1)) + 1

***TGm Editor: Please make the following changes to the last equation shown below in this section:***

(*dec*(BSSID[39:47])*mod*(291)) + 1

* **Multiple BSSID set**

***TGm Editor: Please make the changes as shown below to the 1st paragraph in this section (REVmd D1.2, P2232L17):***

A multiple BSSID set is characterized as follows:

* All members of the set use a common operating class, channel, Channel Access Functions, and antenna connector.
* The set has a maximum range of 2n for at least one n, where 1  n  46.
* Members of the set have the same 48-n bits (BSSID[0:(47-n)]) in their BSSIDs.[#1300, 1287]
* All BSSIDs within the multiple BSSID set are assigned in a way that they are not available as MAC addresses for STAs using a different operating class, channel or antenna connector.
* LCI report (Location configuration information report)

***TGm Editor: Please make the changes as shown below to the 3rd paragraph below Figure 9-252 in this section (REVmd D1.2, P1031L27):***

The MaxBSSID Indicator field is as defined in 9.4.2.45 (Multiple BSSID element). When set to a nonzero value (n), it indicates the maximum possible number of BSSs, including the reference BSS, which share the same antenna connector and have the same 48–n bits (BSSID[0:(47-n)]) of the BSSIDs. When the BSSIDs of the co-located BSSs are configured at the reporting STA but not represented by the MaxBSSID Indicator field, the BSSID fields are present in the Co-located BSSID List subelement to provide an explicit list of such BSSID values.[#1300, 1287]

* Multiple BSSID element[#1300, 1288, 1287]

***TGm Editor: Please make the changes as shown below to the equation in the 3rd paragraph in this section. Also please add a new NOTE below the equation (REVmd D1.2, P1110L64):***

BSSID(i) = BSSID\_A | BSSID\_B

where

BSSID\_A is ( REF\_BSSID & ZERO[(47-n+1):47] )

BSSID\_B is ( ZERO[0:(47-n)] & *bin*[( ( *dec*(REF\_BSSID[(47-n+1):47]) + i) mod 2n), n] )

And

ZERO[b:c] denotes bits b to c inclusive of a 48-bit address set to 0

REF\_BSSID[b:c] denotes bits b to c inclusive of the REF\_BSSID address

NOTE—For example, assuming the maximum number of BSSIDs in the multiple BSSID set is 8 (i.e., the MaxBSSID Indicator field (n) is set to 3) and the transmitted (reference) BSSID is 8c:fd:0f:7f:1e:f5, the results would be as follows:

ZERO[(47-3+1):47] = ZERO[45:47]

Therefore, BSSID\_A = ( 8c:fd:0f:7f:1e:f5 & ZERO[45:47] ) = 8c:fd:0f:7f:1e:f0

For BSSID(5), *bin*[( ( *dec*(REF\_BSSID[45:47]) + 5) mod 8), 3] = *bin*[((dec(101)+5) mod 8) , 3] = *bin*[2, 3]

Therefore, BSSID(5) = 8c:fd:0f:7f:1e:f2

Similarly, BSSID(2) = 8c:fd:0f:7f:1e:f7