### IEEE P802.11 Wireless LANs

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| 11ax D1.0 MAC Comment Resolution for | | | | |
| Date: 2017-02-28 | | | | |
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Abstract

This submission proposes resolutions for comments of TGax Draft 1.0 with the following CIDs pertinent tp clauses 11.49, and 11.49.1:

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 D1.0 Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGax D1.0 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.***

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| **CID** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 4782 | 144.32 | 11.49.1 | The case of Partial BSS Color is 0 is missing. Specify that when that bit is 0 then the AP uses the AID assignment rules of baseline. | As in comment. | Rejected. P91, L39-42 has the description.  “ The BSS Color field is an unsigned integer whose value is the BSS color of the BSS corresponding to the AP which transmitted this element, except that a value of 0 in this field indicates that there is no BSS color for this BSS.” |
| 5975 | 144.32 | 11.49.1 | Where is the Partial BSS Color field? Please provide the name of the frame and other details. | Please clarify where is the Partial BSS Color field. | Rejected:  The Partial BSS Color field indicates whether or not the BSS applies an AID assignment rule using the partial BSS color bits. If the Partial BSS Color field is set to 1, then the 4 least significant bits of BSS color are used in AID assignment. If the Partial BSS Color field is set to 0, no partial BSS color bits are used in the AID assignment. P92. 1-5  **Figure 9-589cr—HE Operation Parameters field format** ­ |
| 5976 | 144.34 | 11.49.1 | The allocated AID (5:8) and the use of the field is not described. | Please clarify how the AID field is being used and what is happening in the clause. Also please specify how a STA should use the information in the clause. | Rejected:  In Pl:149. 38-42. PL:150-8-11  **27.2.1 Intra-BSS and inter-BSS frame detection**  The following paragraph appears twice and explains how the information is used.  “The value of RXVECTOR parameter PARTIAL\_AID [5:8] in the received VHT PPDU with the RXVECTOR parameter GROUP\_ID equal to 63 is the same as the partial BSS color announced by the AP to which the STA is associated when the Partial BSS Color field in the most recently received HE Operation element is 1.” |
| 7161 | 144.32 | 11.49.1 | BSS Color may switch to a new color due to BSS Color collision. Please clarify the operation under this situation. | As in comment | Rejected.  Since there is no explicit mechanism to report BSS color collision, it is up to the HE BSS AP to decide what to do if the there is BSS color collision. How soon to settle the collision is also up to the HE BSS AP, since if multiple HE BSS APs select same BSS color, the only effect is reducing the spatial reuse opportunity.  Reducing spatial re-use opportunity has minimum impact to the overall channel utilization of radio resources.  Introducing a new mechanism to solve a problem with unforeseeable benefit is not important at this stage of protocol development. |
| 7789 | 144.39 | 11.49.1 | To make the AID12 field (in Trigger frames, etc) unique, and the values 0 and 0xFFF in the least significant 12 bits of AID have special meaning, there are more AID assignment rules. | Change title of subclause to "AID assignment rules".  Add paragraph that states that the assigned AID may not have 0 or 0xFFF in the least significant 12 bits.  Add a paragraph that says the AID must be unique in the least significant 11 bits (to make Tigger and HE ND Announcement work). Or, just say AIDs must be allocated between 1 and 2045 (2046 is also a special value for an unallocated/unused RU). This needs to have an exception for MultiBSSID also, though. | Revised:  (1) Accept the change of the title  Ps45.34-38  (2) The value 0 has been defined in  9.3.1.23  PL:45.34-38  “The AID12 subfield of the User Info field carries the least significant 12 bits of the AID of the STA for which the User Info field is intended. An AID12 subfield that is 0 indicates that the User Info field identifies an RU for random access.User Info fields with AID = 0 shall be allocated only after User Info fields with AID does not equal to 0, if any, and before the MAC padding field, if present.”  (3)  It is clear that by the definition in 9.4.1.8, “A non-DMG STA assigns the value of the AID in the range of 1 to 2007; the 5 MSBs of the AID field are reserved.”, the AID field is unique and limited to 2007. Numbers outside of the range is reserved and will be defined for special reason. AID 2046 and 0 are already defined in the spec in flowing paragraphs,  “Two STA-ID fields in HE-SIG-B shall not have the same value, unless the value is 2046, which is used to indicate an unallocated RU. If an AP sets one of the STA-ID fields in the HE-SIG-B field to match the AID of a non-AP STA, then the non-AP STA may disregard any broadcast RU in the same HE MU PPDU.  P163.8-9  Table 28-22  The STA-ID refers to the AID described in 9.4.1.8 (AID field). The 11 LSBs of the AID field are used to address the STAs in this field. For RUs that carry a broadcast allocation: — For single BSS AP, the STAID for broadcast will be 0 — For Multiple BSS AP, the STAID for broadcast to a specific BSS will follow the group addressed AID assignment in the TIM according to the existing Multi-BSSID TIM operation — For multiple BSS AP, the STAID for broadcast to all BSS of the AP is set to 2047 And further: — STAID value 2046 is used to indicate that the RU carries no data — When a STA transmits on the uplink using the HE MU PPDU format, the STA-ID field is populated by the AID” |
| 8267 | 144.34 | 11.49.1 | The formula for assigning AID is unclear. Is the formula limited to bits 5 to 8, what is the relation with definition of AID in chapter 9.4.1.8 AID field of Revmc ? | as per comment | Rejected  The formula is defined in  11.49.1 and only applied to to the bits 5-8 of the AID field.  9.4.1.8 specifies the range of AIDs,  “A non-DMG STA assigns the value of the AID in the range of 1 to 2007; the 5 MSBs of the AID field are reserved.”  The 11.49.1 specifies how partial AID should be assigned to VHT STAs in an HE BSS.  The two clauses serve different purpose. |
| 9698 | 144.29 | 11.49 | Move subclause 11.49.1 into a new subclause of 27.16 (HE BSS operation). | As per comment. | Accepted |
| 7661 | 144.27 | 11.49 | Move the content in 11.49 to subclause 27 | As in comment | Accepted |
| 6567 | 144.37 | 11.49.1 | Unnecessary variant used for defined term: "BSS color". The term is "BSS Color". | Change to "BSS Color". | Accepted |

**Discussion:**

***[CID 9698, 7761]: Accepted***

Clause 11 defines the MLME functions which interface with the MAC layer.

Clause 11.49 describes an optional AID assignment rule for VHT STAs in an HE BSS which is more suitable to be is clause 27.16.1, HE BSS operation.

*Instruction to specification editor:*

To move the 11.4.9.1 to a subclause in clause27.

***[CID 4782] : Rejected***

P91, L39-42 has the description.

“ The BSS Color field is an unsigned integer whose value is the BSS color of the BSS corresponding to the AP which transmitted this element, except that a value of 0 in this field indicates that there is no BSS color for this BSS.”

***[CID 5975]: Rejected***

Partial BSS color is defined in clause, **9.4.2.219 HE Operation element**.

“The Partial BSS Color field indicates whether or not the BSS applies an AID assignment rule using the partial BSS color bits. If the Partial BSS Color field is set to 1, then the 4 least significant bits of BSS color are used in AID assignment. If the Partial BSS Color field is set to 0, no partial BSS color bits are used in the AID assignment. P92. 1-5”

The field is shown in **Figure 9-589cr—HE Operation Parameters field format**.

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***[CID 5797]:Rejected***

In PL:149.38-42 and PL:150-8-11, “27.2.1 Intra-BSS and inter-BSS frame detection”, the following paragraph appears twice and explains how the information is used.

“The value of RXVECTOR parameter PARTIAL\_AID [5:8] in the received VHT PPDU with the RXVECTOR parameter GROUP\_ID equal to 63 is the same as the partial BSS color announced by the AP to which the STA is associated when the Partial BSS Color field in the most recently received HE Operation element is 1.”

***[7161]: Rejected.***

Since there is no explicit mechanism to report BSS color collision, it is up to the HE BSS AP to decide what to do in the event that the there is BSS color collision. How soon to settle the collision is also up to the HE BSS AP, since if multiple HE BSS APs select same BSS color, the only effect is reducing the spatial reuse opportunity?

Reducing spatial re-use opportunity has minimum impact on the overall channel utilization of radio resources.

Introducing a new mechanism to solve a problem with unforeseeable benefit is not important at this stage of protocol development.

***[8267]: Rejected***

The formula is defined in 11.49.1 and only applied to to the bits 5-8 of the AID field.

9.4.1.8 specifies the range of AIDs.

“A non-DMG STA assigns the value of the AID in the range of 1 to 2007; the 5 MSBs of the AID field are reserved.”

The 11.49.1 specifies how partial AID should be assigned to VHT STAs in an HE BSS.

The two clauses serve different purposes.

***[7789]: Revised***

*(1) Change title of subclause to "AID assignment rules".*

***Agreed.***

*(2) Add paragraph that states that the assigned AID may not have 0 or 0xFFF in the least significant 12 bits.*

***Rejected.***

The value 0 has been defined in

9.3.1.23 PL:45.34-38

“The AID12 subfield of the User Info field carries the least significant 12 bits of the AID of the STA for which the User Info field is intended. An AID12 subfield that is 0 indicates that the User Info field identifies an RU for random access.User Info fields with AID = 0 shall be allocated only after User Info fields with AID does not equal to 0, if any, and before the MAC padding field, if present.”

*(3) Add a paragraph that says the AID must be unique in the least significant 11 bits (to make Tigger and HE ND Announcement work). Or, just say AIDs must be allocated between 1 and 2045 (2046 is also a special value for an unallocated/unused RU). This needs to have an exception for MultiBSSID also, though.*

***Rejected.***

It is clear that by the definition in 9.4.1.8, “A non-DMG STA assigns the value of the AID in the range of 1 to 2007; the 5 MSBs of the AID field are reserved.”, the AID field is unique and limited to 2007. Numbers outside of the range is reserved and will be defined for special reason. AID 2046 and 0 are already defined in the spec in flowing paragraphs,

“Two STA-ID fields in HE-SIG-B shall not have the same value, unless the value is 2046, which is used to indicate an unallocated RU. If an AP sets one of the STA-ID fields in the HE-SIG-B field to match the AID of a non-AP STA, then the non-AP STA may disregard any broadcast RU in the same HE MU PPDU.

P163.8-9

Table 28-22

The STA-ID refers to the AID described in 9.4.1.8 (AID field). The 11 LSBs of the AID field are used to address the STAs in this field. For RUs that carry a broadcast allocation: — For single BSS AP, the STAID for broadcast will be 0 — For Multiple BSS AP, the STAID for broadcast to a specific BSS will follow the group addressed AID assignment in the TIM according to the existing Multi-BSSID TIM operation — For multiple BSS AP, the STAID for broadcast to all BSS of the AP is set to 2047 And further: — STAID value 2046 is used to indicate that the RU carries no data — When a STA transmits on the uplink using the HE MU PPDU format, the STA-ID field is populated by the AID”

**Propose:**

Revised for CID 3166, CID 8396, CID 5682, CID 7273, CID 7274, CID 8117, CID 3019 per discussion and editing instructions in 11-17/0207r0.

***TGax Editor: Modify 9.3.1.23.4 as the following:***

**1.49 HE BSS operation**

**11.49.1 AID ~~assign~~ assignment rule**

If the value of Partial BSS Color field is set to 1, then the HE AP shall allocate AIDs according to the formula for AID (5: 8)

AID(5:8) = *bin*[(*BCB*(0:3)  (*BSSID*(44:47) *BSSID*(40:43))) *mod* 24, 4] where

*BCB*(0:3) stands for the least significant 4 BSS ~~color~~ Color [6567] bits and *bin*[x, 4] is the operator that casts decimal value *x* into 4 bits binary vector.

A non-DMG STA assigns the value of the AID in the range of 1 to 2007; the 5 MSBs of the AID field are reserved. A DMG STA