IEEE P802.11  
Wireless LANs

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| Proposed resolution for comments related to  Random Access AIDs for Associated and Unassociated STAs | | | | |
| Date: 2017-03-09 | | | | |
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Abstract

This submission proposes resolutions for multiple comments received for TGax LB225 (66 CIDs):

7809, 3074, 5999, 9121, 9122, 9123, 5018, 5019, 5020, 5021, 5022, 5023, 5066, 5714, 5986, 6167, 7648, 8156, 8279, 8554, 9100, 9591, 9904, 9975, 9708, 10168, 5364, 7814, 3097, 3229, 3230, 3301\*, 4819, 5035, 5094, 5190, 5370, 5713, 6195, 6677, 6999, 7097, 7845, 8276, 8299, 9528, 9711, 10169, 10010, 5810, 10012, 5365, 9916, 3073, 5411, 6188, 9405, 9919, 9258, 7745, 9827, 9630, 7329, 9997, 9998, 9826

\* CID 3301 has several duplicates which are not listed or counted here. Instead, the duplicate CIDs are being tracked in document 11-17/0010 which is maintained by the TGax Editor.

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.***

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| **CID** | **Section** | **Pg / Ln** | **Comment** | **Proposed Change** | **Resolution** |
| 7809 | 27.5.2.2.1 | 164.46 | AID12 only has the least significant 12 bits of the AID | Change "AID of the STA" to "12 least significant bits of the AID of the STA" | Accepted  Revised sentence as suggested  TGax editor please make the changes as shown in 11-17/0229r0 |
| 3074 | 27.5.2.6 | 173.38 | Trigger frame should be able to indicate whether a pre-associated STA is allowed to respond. May be reserve a special AID, if only associated STAs are allowed to respond, Vs AID0 where any STA is allowed to respond | As in the comment | Revised  Agree with the comment in general.  Defined a separate AID (2045) for indicating RA for unassociated STAs.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 5999 | 27.5.2.6.1 | 225.34 | Currently every STA in proximity may perform UL OFDMA random access in every RU for UL OFDMA random access. The AP should be able to indicate that only associated STAs are allowed transmit in the random access RU. This ensures that the associated STAs are able to use UL OFDMA random access to transmit buffer status reports which reduces data transmission latency. | Please, allocate new AID value, for instance 1, to dedicate the UL OFDMA random access RU only for the associated non-AP STAs. | Revised  Agree with the comment. However, AID 1 cannot be used since it is for an associated STA (in case of a single BSSID AP) or one of the nontransmitted BSSID in the case where the AP belongs to a multiple BSSID set. Defined a separate AID (2045) for indicating RA for unassociated STAs only. This way associated or unassociated STAs have their own RA during a TWT SP.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 9121 | 27.5.2.2.1 | 164.46 | If AP sets AID12 field to 0, associated STAs and non-associated STAs can transmit on the same resource unsing random access. However, it will be undesirable because their transmissions have different priority, frame type, and purpose. AP has to manage UL OFDMA random access to achieve high effiency. So AP should be able to allocate resource to association STAs only or unassociation STAs only. | Define broadcast AID12 value for unassociated STA only | Revised  Agree with the comment.  Defined separate AID12 value for associated and unassociated STAs so that each can be triggered for RA separately. Also, added text in section 27.5.2.6 to cover the case of RA for unassociated and associated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 9122 | 27.5.2.6 | 172.34 | If AP sets AID12 field to 0, associated STAs and non-associated STAs can transmit on the same resource unsing random access. However, it will be undesirable because their transmissions have different priority, frame type, ack policy, frame length, and purpose. AP has to manage UL OFDMA random access to achieve high effiency. So AP should be able to allocate resource to association STAs only or unassociation STAs only. | Define broadcast AID12 value for unassociated STA only | Revised  Agree with the comment.  The text has been updated to indicate a separate AID12 for unassociated and that for associated STAs. This way their RA RUs will be separate.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 9123 | 9.3.1.23 | 45.35 | If AP sets AID12 field to 0, associated STAs and non-associated STAs can transmit on the same resource unsing random access. However, it will be undesirable because their transmissions have different priority, frame type, ack policy, frame length, and purpose. AP has to manage UL OFDMA random access to achieve high effiency. So AP should be able to allocate resource to association STAs only or unassociation STAs only. | Define broadcast AID12 value for unassociated STA only | Revised  Agree with the comment.  The text has been updated to indicate a separate AID12 for unassociated and that for associated STAs. This way their RA RUs will be separate.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 5018 5019 5020 5021 5022 | 27.5.2.6 | 172 | The following cells are all part of the one comment. The clauses describing the UL OFDMA RA is very confusing and problematic. List of issues are below.   1. Is UL OFDMA RA for associated or unassociated STA? It seems UL OFDMA RA can not be accessed by un-associated STAs, since an STA must announce its support of UL OFDMA RA in HE capabilities element. It is stated in clause ... "A STA shall set the UL OFDMA RA Support subfield in the HE Capabilities element to 1 if it supports UL OFDMA-based random access and set it 0, otherwise." But on clause ...., the specification also stat that AP will indicate whether an un-associated STA can access the RU slots as stated in clause ...   ... if the value of the AID12 subfield of the User Info field is equal to the AID of the STA or to 0 (indicating a random access allocation). A value of 0 also indicates that nonassociated STAs can transmit on the allocated resource using the random access procedure as  described in 27.5.2.6 (UL OFDMA-based random access).  The option to support UL OFMA RA for un-associated STAs is also problematic. If an AP does not know whether there are un-associated STAs waiting for UL OFDMA RA opportunities and whether the un-associated STAs are capable of supporting UL OFDMA RA, how an AP would schedule RA RU for un-associated STAs. There is also no evidence that including the option will benefit HE BSS   1. The rules (or lack of it) about how UL OFDMA RA should be used create a huge challenge for chip design. The D 1.0 specification allows AP to allocated UL OFDMA RA opportunities in one trigger frame for associated and un-associated STAs, and for management and date frames with no restriction on the size of the frames. The D 1.0 specification also allows AP to allocated UL OFDMA RA RU with UL OFDMA scheduled RU. The number of combinations and varieties of receiving frame types, scheduled and random accessed, associated and unassociated, data and management frames; posing a huge challenge for the design of receiver while the option provides little benefit. | Revising the clauses to  (1) Reduce the number of combinations of type of access an AP can schedule in one trigger frame. For example, associated STA only or associated STA for data frame only, unassociated STA only or unassociated STA for management frame and e.t.c.  (2) Disallow a trigger frame to allocate both scheduled and random access RUs. A trigger frame shall either have all RA RUs or all scheduled RUs. The commentator volunteer to re-write the clauses. | Revised  Agree with some of the points highlighted by the commenter.  Defined a separate AID (2045) for indicating RA for unassociated STAs only. AID=0 is used to addressed associated STAs for RA. Keeping RA for associated and unassociated STAs would enable the AP to trigger each type separately.  Commentor: “It seems UL OFDMA RA can not be accessed by un-associated STAs, since an STA must announce its support of UL OFDMA RA in HE capabilities element.”  Response: While this is true to some extent, it is up to AP to decide whether it should set aside one or more RUs for RA and how many of them to assign for unassociated STAs. If there are any unassociated STAs in the neighborhood that do support RA, they could choose to use RUs assigned for RA.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 5023 |  |  | There are a couple of issues with the unrestricted use of UL OFMA RA in trigger-access opportunity. (a) Un-associated STA can't send data frame while associated STA may send both data and management frames. (b) The management functions for associated, and un-associated STA are different and the size of frames may be very different. (c) It is unclear why an AP would schedule RUs for un-associated STAs and not using all available RUs for associated STAs to send UL data. (d) Mixing UL OFMA RA opportunities in one triggered-access duration for associated and un-associated STAs makes little sense. There are many parameters need to consider by AP in order to decide the suitable duration for the UL transmission slot. Any remedy to address the duration issue tends to increase the complexity of the feature. |  | Revised  Agree with the comment  Defined a separate AID (2045) for indicating RA for unassociated STAs only. AID=0 is used to addressed associated STAs for RA. Keeping RA for associated and unassociated STAs would enable the AP to trigger each type separately – thus providing fair opportunity to unassociated STAs.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 5066 | 9.3.1.23 | 45.36 | In TWT SP, if AP want to use random access RU to collect buffer status information from TWT scheduled STAs, AP can send a Trigger frame to indicate an RU with AID12=0. But a STA that has no TWT capability also can use the RU to do OFDMA random access. This is inefficient way. | Define a mechanism to solve this issue. | Revised  Defined a separate AID (2045) for indicating RA for unassociated STAs only. This way AP can assign RA RU(s) only for associated STAs during TWT SP.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 5714 | 27.5.2.3 | 167.59 | why there is a case that the STA is not associated with the AP and can receive a trigger frame destined for it? Is it for pre-associated STA during random access? | Specify how this works, or delete. | Revised  Added text to cover the case for unassociated STAs. More details for Random Access for unassociated STAs can be found in section 27.5.2.6  TGax editor please make the changes as shown in 11-17/0229r0 |
| 5986 | 27.5.2.3 | 167.53 | An HE Trigger-based PPDU may be transmitted as a response to UL OFDMA based random access. The UL OFDMA random access should be referred in the clause 27.5.2.3 to include description of all mechanisms to send HE Trigger-based PPDU. | Add a reference to UL OFDMA random access as one possibility to send HE Triggered PPDU. | Revised  Agree with the comment.  Added text to cover the case for random access  TGax editor please make the changes as shown in 11-17/0229r0 |
| 6167 | 27.5.2.2.1 | 164.46 | the non-associated STA for UL OFDMA-based random access is not defined in 27.5.2.6 | Either remove line 46-48 or define it in 27.5.2.6 | Revised  Agree with the comment.  Added text in section 27.5.2.6 to cover the case of RA for unassociated and associated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 7648 | 27.5.2.3 | 167.54 | Add random OFDMA here | As in comment | Revised  Agree with the comment.  Added text to cover the case of RA for associated and unassociated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 8156 | 27.5.2.3 | 167.59 | When the unassociated STA receives a trigger frame with random access RU, the behavior of this STA is not defined | Define a precedure of association setup through OFDMA random access | Revised  Agree with the comment.  Added text to cover the case of RA for unassociated STAs. Additional details for RA are found in section 27.5.2.6  TGax editor please make the changes as shown in 11-17/0229r0 |
| 8279 | 27.5.2.2.1 | 164:46 | A value of 0 in AID12 indicates that nonassociated STAs can transmit using the random access procedure. Section 27.5.2.6 (UL OFDMA-based random access) describes that STA shall use the RAPS element sent by AP. How nonassociated STA can manage several APs ? | Specify if a limit of number of APs shall be set for nonassociated STA (even the limit is only one AP). | Reject  An unassociated non-AP STA shall use the RAP element advertised by the AP with which it wishes to communicate with via random access. The standard doesn’t need to specify a limit on the number of APs an unassociated non-AP communicates with in random access – it is an implementation choice. |
| 8554 | 27.5.2.3 | 167.64 | "- Otherwise, a STA shall not send an HE trigger-based PPDU." The conditions listed missed the case of AID12 = 0 i.e. transmission of HE trigger-based PPDU during OFDMA based UL Random Access. | Add the condition for the case of AID12 = 0 i.e. transmission of HE trigger-based PPDU during OFDMA based UL Random Access. | Revised  Agree with the comment.  Added text to cover the case of RA for unassociated STAs.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 9100 | 27.5.2.23 | 167.59 | Non associated STA behavior in MU UL is not defined | Use same mechanism as described in Multi user uplink random access for non associated STA | Revised  Agree with the comment.  Added text to cover the case of RA for unassociated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 9591 | 27.5.2.3 | 167.52 | OFDMA random access (AID 0) case is not included. | Describe it. | Revised  Agree with the comment.  Added text to cover the case of RA for unassociated STAs.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 9904 | 27.5.2.3 | 167.54 | Transmitting a trigger-based PPDU using random access resource is also available. Need further descriiption on this. | As in the comment. | Revised  Agree with the comment.  Added text to cover the case of RA for unassociated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 9975 | 27.5.2.3 | 167.59 | The MU transmission procedure for unassociated STAs is not defined | Define a procedure for unassociated STAs | Revised  Agree with the comment.  Added text to cover the case for unassociated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 9708 | 27.5.2.2.1 | 164.46 | "A value of 0 also indicates that non-associated STAs can transmit on the allocated resource using the random access procedure as described in 27.5.2.6 (UL OFDMA-based random access)." Allowing a non-associated STA to an UL OFDMA-based random access is not defined in TGax draft 1.0. Remove the corresponding paragraph. | As per comment. | Revised  Added text in section 27.5.2.6 to cover the case of RA for unassociated and associated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 10168 | 27.5.2.3 | 167.55 | the condition for OFDMA random access (AID12 set to 0) is not included | change to "The received PPDU contains either a Trigger frame (that is not an MU-RTS variant) with a User Info field addressed to the STA or AID12 set to 0, or an MPDU,...". | Revised  Agree with the comment.  Added text to cover the case of RA for unassociated STAs.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 5364 | 27.5.2.2.1 | 165.3 | From text it is not clear whether the User Info field with AID = 0 is addressed to a STA | Clarify whether the User Info field with AID = 0 is considered here to be addressed to a STA | Revised  Added a note which explains that a non-AP STA shall not participate in RA when it is addressed in an MPDU containing UL MU Response Scheduling carried in the same A-MPDU as the trigger frame that assigns resources for RA.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 7814 | 27.5.2.3 | 167.57 | AID12 is equal to the least significant 12 bits of the AID | Change "AID12 subfield is equal to the AID" to "AID12 subfield is equal to the 12 least significant bits of the AID" | Revised  Agree with the comment.  Revised text to indicate 12 LSBs of the AID of the STA.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 3097 | 27.5.2.3 | 167.59 | There is a TBD in normative text. Gets my automatic "no" vote. "The UserInfo field is addressed to a STA if the AID12 subfield is equal to the AID of the STA and the STA is associated with the AP. If the STA is not associated withthe AP, TBD" | Delete cited text. | Revised  Agree with the comment.  Added text to cover the case for unassociated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 3229 | 27.5.2.3 | 167.58 | Cover the case of random access and AID=0 here as well: "If the STA is not associated with the AP, TBD." | As in the comment | Revised  Agree with the comment.  Added text to cover the case of random access with AID=0.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 3230 | 27.5.2.3 | 167.58 | "If the STA is not associated with the AP, TBD." Specify the TBD. | As in the comment | Revised  Agree with the comment.  Added text to fix the TBD (covers random access for associated and unassociated STAs).  TGax editor please make the changes as shown in 11-17/0229r0 |
| 3301 | 27.5.2.3 | 167.59 | "TBD" is a placeholder and not allowed in drafts in WG letter ballots as per IEEE 802.11 WG policies. | Remove TBD | Revised  Agree with the comment.  Added text to fix the TBD and cover the case of RA for unassociated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 4819 | 27.5.2.3 | 167.57 | If the STA is not associated with the AP, TBD. | Define the TBD. If the STA is not associated with the AP, a value of 0 indicates the allocation of a random access RU which can be used also by non-associated STAs | Revised  Agree with the comment.  Added text to fix the TBD (covers random access for associated (AID=0) and unassociated STAs (AID=2045)).  TGax editor please make the changes as shown in 11-17/0229r0 |
| 5035 | 27.5.2.3 | 167.58 | "If the STA is not associated with the AP, TBD" | Suggest to define an AID assigned by an AP for a STA that is not associated with the AP; one option is that the AP defines an AID for generic unassociated STA and then define a specific value for a specific unassociated STA; the other option is that the AP assigns an AID for a specific unassociated STA; | Revised  Added text to cover the case for unassociated STAs with AID=2045. We don’t need separate AIDs to identify each unassociated STA.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 5094 | 27.5.2.3 | 167.59 | Incomplete Draft. | Fill in for "tbd". | Revised  Agree with the comment.  Added text to fix the TBD (covers random access for associated and unassociated STAs).  TGax editor please make the changes as shown in 11-17/0229r0 |
| 5190 | 27.5.2.3 | 167.59 | "If the STA is not associated with the AP, TBD." | I'm not sure how we went to letter ballot with a TBD, but obviously this needs to be fixed. | Revised  Agree with the comment.  Added text to fix the TBD and cover the case of RA for unassociated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 5370 | 27.5.2.3 | 167.59 | If the STA is not associated with the AP, TBD | Define TBD | Revised  Agree with the comment.  Added text to fix the TBD and cover the case of RA for unassociated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 5713 | 27.5.2.3 | 167.59 | There is a TBD in the spec. Define this TBD bahvior. | Define this "TBD" behavior | Revised  Agree with the comment.  Added text to cover the case for unassociated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 6195 | 27.5.2.3 | 167.59 | Non-associated behavior is not defined and marked as TBD. Can't determine ramifications of design until it is created and defined. | Solicit members for methods to satisfy the non-associated behavior. | Revised  Agree with the comment.  Added text to fix the TBD and cover the case for unassociated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 6677 | 27.5.2.3 | 167.67 | UNRESOLVED TBD. DRAFTS MUST BE COMPLETE BEFORE BEING SENT TO LETTER BALLOT. IT IS UNACCEPTABLE TO HAVE ANY UNRESOLVED TBDs AND THIS SHOULD HAVE DISQUALIFIED THE LETTER BALLOT FROM BEING LAUNCHED. | Resolve the TBD. | Revised  Added text to fix the TBD  TGax editor please make the changes as shown in 11-17/0229r0 |
| 6999 | 27.5.2.3 | 167.59 | There is a TBD in the draft. All TBD should be removed from the draft prior to WG letter ballot. Please correct this issue. | Remove the TBD and provide what behavior is expected if the STA is not associated with the AP. | Revised  Agree with the comment.  Added text to fix the TBD and cover the case of RA for unassociated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 7097 | 27.5.2.3 | 167.59 | ", TBD" should be removed and the procedures should be specified. | as in comment | Revised  Agree with the comment.  Added text to fix the TBD and cover the case of RA for unassociated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 7845 | 27.5.2.3 | 167.59 | The behaviour if the STA is not associated with the AP is "TBD". | Delete the final sentence of the first bullet; if the STA is not associated with the AP then it should not send an HE trigger-based PPDU and hence is handled by the final bullet (line 64). | Revised  Agree with the comment.  Added text to cover the case for unassociated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 8276 | 27.5.2.3 | 167.58 | The 3rd paragraph describes the conditions for a HE STA to transmit a HE trigger-based PPDU. If the STA is not associated with the AP, procedure is TBD. | The TBD should be replaced by the random access procedure (as described in page 164 line 46). The case of AID=0 should also be considered with same behavior. | Revised  Agree with the comment.  Added text to fix the TBD and cover the case of RA for unassociated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 8299 | 27.5.2.3 | 167.59 | If the STA is not associated with the AP, TBD | Remove TBD | Revised  Agree with the comment.  Added text to fix the TBD and cover the case for unassociated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 9528 | 27.5.2.3 | 167.59 | "If the STA is not associated with the AP, TBD."  TBD should be removed. | Remove the last sentence of this bullet. | Revised  Agree with the comment.  Added text to fix the TBD and cover the case for unassociated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 9711 | 27.5.2.3 | 167.58 | "If the STA is not associated with the AP, TBD." Remove TBD sentence. Otherwise, define any UL MU random access behavior for a non-associated STA. | As per comment. | Revised  Agree with the comment.  Added text to fix the TBD and cover the case for unassociated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 10169 | 27.5.2.3 | 167.59 | there is a TBD for unassociated STA | resolve the TBD | Revised  Agree with the comment.  Added text to fix the TBD and cover the case for unassociated STAs  TGax editor please make the changes as shown in 11-17/0229r0 |
| 10010 | 27.5.2.2.1 | 164.46 | Non-associated STAs shouldn't be able to transmit at random access. | If Trigger Frame which STA receives doesn't have associated AP's TA, STA should disregard this frame. | Reject  There are some benefits (e.g., simultaneous access) to allowing unassociated STAs access the AP via random access. A new AID value (2045) is defined to separate random access for associated an unassociated STAs. Depending on the situation, an AP could decide on the number of RUs to assign for each category of STAs. Revised text in section 27.5.2.6 covers the case of random access procedure for unassociated and associated STAs. |
| 5810 | 27.5.2.3 | 167.58 | If a STA is not associated to an AP, but received a Trigger frame from it, it should discard the Trigger frame, and does not respond with HE Trigger based PPDU | Replace the text: "TBD", with "then it shall discard the Trigger frame." | Reject  Please see resolution to CID 10010 |
| 10012 | 27.5.2.4 | 167.59 | Non associated STA should not be able to respond to the trigger frame. | Replace TBD as suggested. | Reject  Please see resolution to CID 10010 |
| 5365 | 27.5.2.5 | 171.59 | Using BSRP with RU allocated for random access may not be efficient if all the STAs which receive this BSRP reply | Add the following condition to the end of the sentence: if at least the buffers of the STAs are not empty | Revised  Agree with the comment  Updated text to clarify that only STAs that support random access and have non-empty buffer may use the RU(s) assigned for RA.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 9916 | 27.5.2.5 | 171.57 | When a STA receives a BSRP variant Trigger frame which does not schedule an RU for the STA, it is not clear if the STA shall participate random access or not. Need further clarification. | As in the comment. | Revised  Agree with the comment  Updated text to clarify that this is not a mandatory behavior and only STAs that support random access and have non-empty buffer may use the RU(s) assigned for RA.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 3073 | 27.5.2.6.2 | 173.38 | Condition for when the STA should use random access needs to be defined. In the absence of such restriction there will be a lot of un-necessary random access attempts | As in the comment | Revised  Agree with the comment.  Random Access RUs are limited and STAs that can easily access the AP should avoid using RA to send UL to the AP. As described in baseline spec (see 10.3.3), STAs long retry count (SLRC) is increment when a STA encounters are retry. It is set to 0 when the STA receives an ACK in response to successful data transmission to the AP. Therefore, if a non-AP STA has a non-zero SLRC value, it means that its most recent attempt to communicate with the AP has failed. This is a good indicator of whether the STA has some data to send to the AP and should be given priority for access the AP via RA.  Added text to suggest that only the STAs that have a non-zero SLRC should decrement their OBO counter. Thus giving priority to STAs that have pending data for the AP.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 5411 | 27.5.2.6.2 | 173.45 | The spec needs to define the operation of a STA when the STA decrements its OBO counter to zero and has no data to transmit. | As per comment | Revised  Agree with the comment.  Please see resolution to CID 3073 |
| 6188 | 27.5.2.6.2 | 173.45 | If a STA does not have any data to transmit, it shall not participate random access procedure, or, at least it shall not transmit anything including QoS Null even if its OBO becomes 0. | As per comment | Revised  Agree with the comment.  Please see resolution to CID 3073 |
| 9405 | 27.5.2.6.2 | 173.36 | Does a random access capable STA without Data to transmit decrements its OBO value upon a reception of TF-R? | Please clarify | Revised  Agree with the comment.  Please see resolution to CID 3073 |
| 9919 | 27.5.2.6.2 | 173.36 | It is not clear if an HE STA is allowed to participate in random access procedure even in case the HE STA does not have anything to transmit. For example, if the HE STA keeps decreasing the OBO counter by participating random access procedure even in case the STA does not have anything to transmit, the STA may get advantage when the STA has something to transmit because the STA may use smaller OBO counter value. This is a cheating and shouldn't be allowed. Further clarification is needed. | As in the comment. | Revised  Agree with the comment.  Please see resolution to CID 3073 |
| 9258 | 9.3.1.23 | 41.59 | How to set the RA field of the Trigger frame when it carries STA Info fields for OFDMA-based random access needs to be specified. | Add the following sentence to the end of the paragraph starting from page 41 line 59: "When at least one of the RU in the User Info field is allocated to UL-OFDMA-based random access, then the RA field of the Trigger frame is set to the broadcast address." | Revised  Agree with the comment.  Added text to indicate that RA is set to broadcast if the there are multiple User Info field or if at least one User Info field is allocating RUs for random access.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 7745 | 9.3.1.23 | 45.36 | This sentence is confusing. Also, there is no need to say that all User Info fields come before the Padding, that is part of the format per Figure 9-52c. | Reword: "All User Info fields with AID12 not equal to zero appear before any User Info fields with AID12 equal to zero." | Revised  Agree with the comment  Updated text is similar to the one proposed by the commenter with additions to cover case of AID12=2045.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 9827 | 9.3.1.23 | 45.37 | Normative behavior such as "User Info fields with AID = 0 shall be..." is not appropriate in clause 9. Move this part to sub-clause related with AP behavior for UL MU transmission. | As in the comment. | Revised  Agree with the comment.  The section was updated per CID 7745 and doesn’t contain normative text  TGax editor please make the changes as shown in 11-17/0229r0 |
| 9630 | 9.3.1.23 | 45.37 | "User Info fields with AID = 0 shall be allocated only after User Info fields with AID not equals to 0, if any, and before the MAC padding field, if present." Remove "shall" from clause 9 according 802.11 Editorial Style Guide. | As per comment. | Revised  Agree with the comment.  The section was updated per CID 7745 and doesn’t contain normative text  TGax editor please make the changes as shown in 11-17/0229r0 |
| 7329 | 9.3.1.23 | 45.37 | For the sentence "User Info fields with AID = 0 shall be allocated only after User Info fields with AID not equals to 0 ...", are you referring to the value of the AID12 subfield? It is not clear, | Replace "User Info fields with AID = 0 shall be allocated only after User Info fields with AID not equals to 0 ..." with "User Info fields with zero AID12 subfield shall be allocated only after User Info fields with nonzero AID12 subfield ...". | Revised  Agree with the comment.  The section was updated per CID 7745 and doesn’t contain normative text  TGax editor please make the changes as shown in 11-17/0229r0 |
| 9997 | 9.3.1.23 | 45.37 | "User Info fields with AID = 0..." There is no AID field in the User Info fields. | change AID to AID12 | Accepted  Agree with the comment. Fixed text to indicate AID12 field.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 9998 | 9.3.1.23 | 45.38 | "before the MAC padding field" This rule is common for AID12 not equal to 0. The rule is self explanatory from the figure 9-52c - Trigger frame. | Remove last part of the sentence starting , ", and before the MAC padding..." | Accept  Agree with the comment. Removed the text as suggested.  TGax editor please make the changes as shown in 11-17/0229r0 |
| 9826 | 9.3.1.23 | 45.38 | It should be Padding subfield in the Trigger frame, and is different from MAC padding field. | Modify the sentence to "User Info fields with AID = 0 is allocated only after User Info fields with AID not equals to 0, if any, and before the Padding subfield of the Trigger frame, if present.". | Revised  Removed reference to padding field from the sentence since it is not limited to AID12=0. See CID 9998 for further details.  TGax editor please make the changes as shown in 11-17/0229r0 |

* Rules for soliciting UL MU frames
* General

TGax Editor: Please modify the 2nd paragraph (pg 168, line 52 in D1.1) in this section as follows:

An AP may transmit a PPDU that elicits an HE trigger-based PPDU from one or more STAs by including in the PPDU:

* One or more Trigger frames that includes one or more User Info fields with the following AID12 subfield setting: ~~addressed to one or more of the recipient STAs.~~
  + ~~For recipient STAs that are associated with the AP, the User Info field is addressed to a recipient STA if the value of the~~ The AID12 subfield ~~of the User Info field~~ is equal to [7809]the 12 LSBs of the AID of the STA when the User Info field is addressed to the STA that is associated with the AP.
  + The AID12 subfield is equal ~~or~~ to 0 when the User Info field is addressed to STAs that are associated with the AP and that follow the OFDMA random access procedure ~~(indicating a random access allocation~~ as described in 27.5.2.6 (UL OFDMA-based random access))~~.~~.
  + The AID12 subfield is set to 2045 when the User Info field is addressed to STAs that are not associated with the AP and that follow ~~A value of 0 also indicates that non-associated STAs can transmit on the allocated resource using~~ the OFDMA random access procedure as described in 27.5.2.6 (UL OFDMA-based random access).[3074, 5018, 5019, 5020, 5021, 5022, 5023, 5035, 5066, 5364, 5714, 5986, 5999, 6167, 7648, 8156, 8279, 8554, 9100, 9121, 9122, 9123, 9591, 9904, 9975, 9708, 10168]
* An UL MU Response Scheduling A-Control subfield of individually addressed MPDUs contained in the HE MU PPDU that:
* Are carried in a S-MPDU format that solicits an immediate Ack frame (see 10.13.8 (Transport of S-MPDUs))
* Are carried in an A-MPDU format that solicits an immediate BlockAck frame (see 10.24.7.7 (Originator's behavior))
* Are carried in a multi-TID A-MPDU format that solicits an immediate Multi-STA BA frame (see 27.10.4 (A-MPDU with multiple TIDs))

NOTE—The AP additionally follows the rules defined in 27.3.3 (Procedure at the originator) when fragments are present in the generated MPDU(s).

More than one Trigger frame may be aggregated in an A-MPDU. If more than one Trigger frame is aggregated in an A-MPDU, all of them shall have the same content.

The following two frames shall not be present in the same A-MPDU:

* A Trigger frame with a User Info field addressed to a STA
* An MPDU that contains an UL MU Response Scheduling A-Control subfield and that is addressed to the same STA

NOTE – A STA that is the intended receiver of a User Info field in a Trigger frame (i.e., AID12 subfield equal to the 12 LSBs of the AID of the STA) or of an UL MU Response Scheduling Control field cannot contend for a random access RU that is indicated by a Trigger frame contained in the same PPDU and will not decrement its OBO counter.[5364]

* STA behavior

TGax Editor: Please modify the 3rd paragraph (pg 172, line 11 in D1.1) in this section as follows:

A STA shall commence the transmission of an HE trigger-based PPDU at the SIFS time boundary after the end of a received PPDU, when all the following conditions are met:

* The received PPDU contains either a Trigger frame (that is not an MU-RTS variant) with a User Info field addressed to the STA, or an MPDU addressed to the STA that contains an UL MU Response Scheduling A-Control subfield. The User Info field is addressed to a STA if one of the following conditions are met:
  + ~~the~~ The AID12 subfield is equal to the [7814]12 LSBs of the AID of the STA and the STA is associated with the AP. ~~If the STA is not associated with the AP, TBD~~[3097, 3229, 3230, 3301, 4819, 5035, 5094, 5190, 5370, 5713, 6195, 6677, 6999, 7097, 7845, 8276, 8299, 9528, 9711, 10169]
  + The AID12 subfield is equal to 0, the STA supports OFDMA random access and the STA is associated with the AP, and the STA’s OBO counter reaches 0 (see 27.5.2.6 (UL OFDMA-based random access)).
  + The AID12 subfield is equal to 2045, the STA supports OFDMA random access, and the STA is not associated with the AP, and the STA’s OBO counter reaches 0 (see 27.5.2.6 (UL OFDMA-based random access)).[3074, 5018, 5019, 5020, 5021, 5022, 5023, 5035, 5066, 5364, 5714, 5986, 5999, 6167, 7648, 8156, 8279, 8554, 9100, 9121, 9122, 9123, 9591, 9904, 9975, 9708, 10168]
* The CS Required subfield in the Trigger frame is 1 and the UL MU CS condition described in 27.5.2.4 (UL MU CS mechanism) indicates the medium is idle, or the CS Required subfield in a Trigger frame is 0.
* Otherwise, a STA shall not send an HE trigger-based PPDU
* HE buffer status feedback operation for UL MU

TGax Editor: Please modify this paragraph (pg 176, line 13 in D1.1) as follows:

An AP can also solicit one or more non-AP STAs for their BSR(s) by sending a BSRP variant Trigger frame (see 9.3.1.23 (Trigger frame format)). The non-AP STA responds (solicited BSR) as defined below:

* The STA that receives a BSRP variant Trigger frame shall follow the rules defined in 27.5.2.3 (STA behavior) to generate the trigger-based PPDU when the Trigger frame contains the STA's AID in any of the Per User Info fields; otherwise ~~the STA shall~~, if the STA’s buffers are not empty and the STA supports OFDMA random access, it may[5365, 9916] follow the rules defined in 27.5.2.6 (UL OFDMA-based random access) to gain access to a random RU and generate the Trigger-based PPDU when the Trigger frame contains one or more random RU(s).
* The STA shall include in the HE trigger-based PPDU one or more QoS Null frames containing one or more of the following:
* The QoS Control field(s) with Queue Size subfields for each of the TIDs for which the STA has buffer status to report to the AP.
* The BSR A-Control field with the Queue Size All subfield indicating the queue size for all the ACs, indicated by the ACI Bitmap subfield, for which the STA has buffer status to report to the AP when the AP has indicated its support in the A-BSR Support subfield of its HE Capabilities element. The STA shall set Delta TID, SF, ACI High and Queue Size High subfields of the BSR A-Control field as defined in 9.2.4.6.4.5 (Buffer Status Report (BSR))).
* The HE STA shall not solicit an immediate response for the frames carried in the trigger-based PPDU (e.g., by setting the Ack Policy subfield of the frame to Normal Ack or Implicit BAR).

NOTE—Similar to unsolicited BSR, the STA can set Queue Sizes in either QoS Control or BSR A-Control field to 255 to indicate unknown/unspecified BSR for a TID, AC or all AC.

* UL OFDMA-based random access[3074, 5018, 5019, 5020, 5021, 5022, 5023, 5035, 5066, 5364, 5714, 5986, 5999, 6167, 7648, 8156, 8279, 8554, 9100, 9121, 9122, 9123, 9591, 9904, 9975, 9708, 10168]
* General

TGax Editor: Please modify the 2nd paragraph as follows:

UL OFDMA-based random access is a mechanism for HE STAs to randomly select resource units (RUs) assigned by an AP in a soliciting Trigger frame that contains RUs for random access. An RU for random access shall be identified by an AID12 subfield ~~equal to 0~~ contained in a User Info field of a Trigger frame that is equal to:~~.~~

* 0 to indicate a random RU that is intended for associated STAs
* 2045 to indicate a random RU that is intended for unassociated STAs

An HE AP may transmit a Basic Trigger frame or a BSRP Trigger frame that contains one or more RUs for random access.

* Random access procedure

TGax Editor: Please modify the 4th and 5th paragraph (pg 177, line 52 in D1.1) as follows:

An HE AP that transmits a Trigger frame for random access, uses the AID value 0 to indicate random RUs allocated for STAs associated with it, and the AID value 2045 to indicate random RUs allocated for STAs not associated with it. For an HE STA, that is associated with the AP and has a non-zero SLRC[3073, 5411, 6188, 9405, 9919], if the OBO counter is smaller than the number of RUs assigned to AID12 subfield value 0 in a Trigger frame, then the HE STA shall decrement its OBO counter to zero. Otherwise, the HE STA decrements its OBO counter by a value equal to the number of RUs assigned to AID12 subfield value 0 in a Trigger frame. For an HE STA, that is not associated with the AP and has a non-zero SLRC[3073, 5411, 6188, 9405, 9919], if the OBO counter is smaller than the number of RUs assigned to AID12 subfield value 2045 in a Trigger frame, then the HE STA shall decrement its OBO counter to zero. Otherwise, the HE STA decrements its OBO counter by a value equal to the number of RUs assigned to AID12 subfield value 2045 in a Trigger frame. For instance, as shown in Figure 27-1 (Illustration of the UL OFDMA-based random access procedure), HE STA 1 and HE STA 2, both associated with the AP and having non-zero SLRC, decrement their non-zero OBO counters by 1 in every RU assigned to AID12 subfield value 0 for random access within the Trigger frame.

For an HE STA associated with the AP, if the OBO counter is 0 or if the OBO counter decrements to 0, then the STA randomly selects one of the RUs assigned to AID12 subfield value 0. For an HE STA not associated with the AP, if the OBO counter is 0 or if the OBO counter decrements to 0, then the STA randomly selects one of the RUs assigned to AID12 subfield value 2045. If the selected RU is idle as a result of both physical and virtual carrier sensing as defined in subclause 27.5.2.4 (UL MU CS mechanism), the HE STA transmits its HE trigger-based PPDU in the randomly selected RU. If the selected RU is considered busy as a result of either physical or virtual carrier sensing, then the HE STA shall not transmit its HE trigger-based PPDU in the randomly selected RU. Instead, the STA ~~and it~~ randomly selects any one of the RUs that are assigned to AID12 subfield value 0 if it is an associated STAs or AID12 subfield value 2045 if it is an unassociated STA in the subsequent Trigger frame. If the OBO counter is not zero and does not decrements to 0, the STA resumes with its OBO counter in the next Trigger frame with RUs assigned for random access.

* Trigger frame format

TGax Editor: Please modify the 4th paragraph (pg 42, line 59 in D1.1) in this section as follows:

The RA field of the Trigger frame is the address of the recipient STA. If the Trigger frame has one User Info field then the RA of the Trigger frame is the STA's MAC Address. If the Trigger frame has multiple User Info fields or at least one User Info field that allocates random access RU(s),[9258] then the RA of the Trigger frame ~~Frame~~ is the broadcast address. If the Trigger Type field is GCR MU-BAR, the RA field is set to the MAC address of the group for which reception status is being requested.

TGax Editor: Please modify the 24th paragraph (pg 46, line 34 in D1.1) in this section as follows:

The AID12 subfield of the User Info field carries the 12 LSBs least significant ~~12~~ bits of the AID of the STA for which the User Info field is intended. An AID12 subfield that is equal to 0 or equal to 2045[3074, 5018, 5019, 5020, 5021, 5022, 5023, 5035, 5066, 5364, 5714, 5986, 5999, 6167, 7648, 8156, 8279, 8554, 9100, 9121, 9122, 9123, 9591, 9904, 9975, 9708, 10168] indicates that the User Info field identifies an RU for random access (see 27.5.2.6 (UL OFDMA-based random access)). All User Info fields with AID12 not equal to 0 or not equal to 2045 appear before any User Info fields with AID12 equal to 0 or equal to 2045 (if any present).[7745, 9630, 9827, 7329, 9997]~~User Info fields with AID = 0 shall be allocated only after User Info fields with AID not equals to 0, if any~~[9998, 9826]~~, and before the MAC padding field, if present.~~