IEEE P802.11  
Wireless LANs

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| **CIDs for: Section 9.3.1.9.7 Multi STA BAs** |
| **Date:** 2016-04-17 |

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| --- | --- | --- | --- | --- |
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Abstract

This submission proposes resolutions for multiple comments related to TGax D0.1 with the following CIDs (**31 CIDs**):

* 80, 1284, 1182, 1143, 1286, 962, 1287, 831, 508, 367, 100, 99, 98, 999, 1812, 2580, 2458, 2414, 2389, 2232, 2185, 2170, 1285, 1813, 2582, 1811, 1810, 1715, 1291, 1288, 1814

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** | **Commenter** | **PP.LL** | | **Comment** | **Proposed Change** | **Resolution** |
| 80 | Ahmadreza Hedayat | | 18.35 | It is not described wether the same frame structure is used for multi-STA multi-TID BA. If so then need to clarify how a STA identifies multiple TID within this frame. | As in the comment. | REVISED. Please see below. |
| 1284 | Mark RISON | | 19.07 | "indicates the acknowledgement of successful reception of either a single MPDU or of all the MPDUs carried in the eliciting (A-) MPDU" -- well, which is it? | Change to "indicates the acknowledgement of (all) the MPDU(s) carried in the eliciting (A-) MPDU" | REJECT. The indication depends on the context of what is transmitted. |
| 1182 | Lei Huang | | 19.12 | "When the Fragment Number subfield is 1" should be "When the Fragment Number subfield is 0" | Change "When the Fragment Number subfield is 1" to "When the Fragment Number subfield is 0" | REVISED. Please see below. |
| 1143 | Kwok Shum Au | | 19.31 | There is no BlockAck Bitmap field. | Change "BlockAck Bitmap field" with "Block Ack Bitmap field". | Accept |
| 1286 | Mark RISON | | 19.22 | "When the Fragment Number subfield is 1" -- the ACK Type subfield needs to be 1 too | Add words to that effect | Reject. The ACK Type value conditions are already mentioned at 19.09 |
| 962 | kaiying Lv | | 19.00 | change "when the Fragment Number subfield is 1" to "when the Fragment Number subfield is 0" | as the comment | REVISED. Please see below. |
| 1287 | Mark RISON | | 19.32 | "for 4 fragments of each of the 16 MSDUs" -- what if the 16 are not all MSDUs, but some are A-MSDUs? Can they still be fragmented? | Either say only the first bit is used in the case of A-MSDUs, or add "or A-MSDUs" | REVISED. A-MSDUs are not allowed to be fragmented. It is clarified in the Note. Please see below |
| 831 | Jinsoo Ahn | | 18.36 | RA field of Multi-STA BA needs to be determined except for the case of single STA | Insert the following "RA field of Multi-STA BA shall be set to identical value of TA field(MAC address of AP)" | REVISED. Please see resolution to CID 2212 |
| 508 | Dengyu Qiao | | 19.11 | MAC Motion #72 (length indication of BA Bitmap subfield of M-BA) was approved but no corresponding spec text is present in the draft | TBD | REVISED. Please see below. |
| 367 | Brian Hart | | 19.26 | Equation only works if FN is bounded | insert "where 0 <= FN <= 3 | REJECT. No need to add a condition, as it is already clarified in 25.3.2. There, it says that the fragmentation number is limited up to 4 fragments. |
| 100 | Alfred Asterjadhi | | 37.04 | Add a note that TID equal to 15 is allocated to identify that this acknolwedgement applies to the MGMT frame carried in the soliciting PPDU. | As in comment. | REVISED. Please see below. |
| 99 | Alfred Asterjadhi | | 37.01 | The AP does not have an AID as such this statement is not technically true (for M-BA addressed to the AP we need to define what the value of the STA ID is). | Replace this field with something else: E.g., STA ID and add description for the case when the frame is intended to the AP (i.e., the value it takes when the RX is the AP that does not have an AID). | REVISED. Please see below. |
| 98 | Alfred Asterjadhi | | 19.15 | The BlockAck Bitmap subfield of the Multi STA BA can be of variable length. There was a motion on this (where differentiation between the different lengths (maybe 4, 8, 32, ...?) was in the FN subfield). Amend the subclause to account for this case, ensuring that the signaling is consistent. Perhaps it is good to have a table to map the values of the FN and the bitmap lenghts and when fragment level 3 mapping of the bitmap is enabled. Also this paragraph is valid when Fragment Number subfield is 0 not 1. | As in comment. | REVISED. Please see below. |
| 999 | kaiying Lv | | 18.33 | An efficient way to acknowledge the previous UL MU PPDU and trigger the next UL MU PPDU should be provided | Comment resolution and supporting PPT will be provided | Reject. Currently this can be done by aggregating trigger frame and ack in an AMPDU. Adding a new frame format is not needed" |
| 1812 | Rojan Chitrakar | | 19.22 | Since some of the bits of the fragment number subfield may be used for other purposes (for e.g. to indicate the Bitmap length), it is incorrect to say "fragment number subfield is 1." | Change "fragment number subfield" to the specific bit/s used to indicate use of dynamic fragmentation. | REVISED. Please see below. |
| 2580 | Young Hoon Kwon | | 18.41 | As multi-TID A-MPDU is supported for HE STA, there's no reason not to have BA for multiple TID for a single STA in multi-STA BA. Therefore, Per-STA info subfield can be multiple of information shown in Figure 9-37a. | Modify the text from "The Per STA Info subfield is shown in ..." to "The Per STA Info subfield comprises one or more instances of the Per STA TID Info subfield shown in Figure 9-37a" and modify the heading of Figure 9-371 from "Per STA Info subfield format" to "Per STA TID Info subfield format". | REJECT. The intent is to show per-STA info (which can be per-AID/TID combination. |
| 2458 | Yongho Seok | | 19.08 | "If the ACK Type field is 0, then the Block Ack Starting Sequence Control and Block Ack Bitmap are not present and the Per STA Info field indicates the acknowledgement of successful reception of either a single MPDU or of all the MPDUs carried in the eliciting (A-) MPDU." When the eliciting A-MPDU contains the Block ACK Request frame, what is the meaning of the ACK Type field set to 0? Because the the Block ACK Request frame can ask the acknowledgement of other MPDU contained in the previous frame, the ACK Type field is not allowed to set to 0. | As per comment | REVISED. Please see below. |
| 2414 | Yongho Seok | | 19.03 | What is the TID value of Per AID TID Info subfield, if the ACK Type value is equal to 0 and the eliciting A-MPDU carries the multi-TID MPDUs? | As per comment | REVISED. Please see below. |
| 2389 | Yongho Kim | | 19.01 | When all MPDUs are received sucessfully, the multi STA Block Ack can be sent without Block Ack Starting Sequence Control subfield and Block Ack bitmap by using the predetermined AID value(e.g. 2047) and setting ACK Type field to 0 to reduce the Ack duration. | Change the paragraph as below: The AID field carries the AID of the STA for which the Per STA Info field is intended. 'The AID field is set to 2047 to indicate all the allocated STA when all MPDUs are received sucessfully in the previous UL MU transmission.' | Reject. This will introduce yet another format of M-BA, without significant benefit. |
| 2232 | Tomoko Adachi | | 19.06 | It is said that the Block Ack Starting Sequence Control and Block Ack Bitmap can be omitted when either a single MPDU or all the MPDUs carried in the eliciting (A-) MPDU are received successful. The case of explicit BlockAckReq should be taken care of. One way be the following: Limit the data under BlockAck policy to only use implicit BlockAckReq. Ban the omission of the Block Ack Bitmap when receiving a BlockAckReq frame. | As in comment. | REVISED. Please see below. |
| 2185 | Tomoko Adachi | | 19.06 | As it is a BA frame, the presence of the Block ACK Bitmap field should be default. | Change the meaning of the ACK Type field so that it is set to 0 (default) when the Block Ack Starting Sequence Control and Block Ack Bitmap field are present and set to 1 for the other case. | REVISED. Please see below. |
| 2170 | stephane baron | | 18.37 | For unregistered station, do we forbid Block Ack for MU UL OFDMA ? | Clarify how are managed the AID for ungeristered STA | Reject. There are no AIDs for "unregisterd STA". I assume, "registered" is used to mean "associated" |
| 1285 | Mark RISON | | 19.12 | "When the Fragment Number subfield is 1" -- the ACK Type subfield needs to be 1 too | Add words to that effect | Reject. The ACK Type usage is already defined in an earlier paragraph |
| 1813 | Rojan Chitrakar | | 19.31 | Since some of the bits of the fragment number subfield may be used for other purposes (for e.g. to indicate the Bitmap length), it is incorrect to say "fragment number subfield is 1." | Change "fragment number subfield" to the specific bit/s used to indicate use of dynamic fragmentation. | REVISED. Please see below. |
| 2582 | Young Hoon Kwon | | 19.09 | In case multiple TIDs are included within an A-MPDU, it is not clear how to set TID subfield in case ACK Type field is 0. | Two possible solutions are available: (i) add the text "If the ACK Type field is 0, TID subfield is reserved." Or, (ii) modify the text from "... or of all the MPDUs carried in the eliciting (A-) MPDU" to "... or of all the MPDUs of the TID contained in the TID subfield carried in the eliciting (A-) MPDU.". | REVISED. Please see below. |
| 1811 | Rojan Chitrakar | | 19.12 | Since some of the bits of the fragment number subfield may be used for other purposes (for e.g. to indicate the Bitmap length), it is incorrect to say "fragment number subfield is 1." Also, the value should be 0 and not 1. | Change "fragment number subfield" to the specific bit/s used to indicate use of dynamic fragmentation. Change the subfield value to 0. | REVISED. Please see below. |
| 1810 | Rojan Chitrakar | | 18.37 | Instead of being reserved, the TID\_INFO subfield can be used to indicate the number of Per STA Info subfields contained in the BA Information field. | Change the sentence to "The TID\_INFO subfield of the BA Control field of the Multi-STA BlockAck frame indicates the number of Per STA Info subfields, less one, that are contained in the BA Information field. For example, a value of 2 in the TID\_INFO subfield means that three Per STA Info subfields are present. | REJECT. Using TID-INFO will limit the maximum number to 16. Instead, the number of per-AID/TID info can be derived by parsing. |
| 1715 | Osama Aboulmagd | | 19.08 | Currently the number of MDUs in an A-MPDU is limited by the size of the Block Ack bitmap (64 bits). With the use of a single bit to acknowledge all the MPDU is a single A-MPDU is there any limit on the number MPDUs? | Clarify | Reject. No need to specify this, since transmitter doesn't know whether the receiver is going to send "All Ack" or not. The number of MPDUs that the transmitter puts in the A-MPDU will be based on the block ack format it has negotiated (default, 256, variable etc,). |
| 1291 | Mark RISON | | 19.12 | "When the Fragment Number subfield is 1, the Block Ack Starting Sequence Control subfield is as shown in Figure 9-27. The Block Ack Bitmap subfield of the BA Information field of the Multi-STA BlockAck frame contains an 8-octet block ack bitmap." seems garbed (the xref to F9-27 makes no sense, for one) | Use similar wording to that in 9.3.1.9.3, namely "When the Fragment Number subfield is 0, the Block Ack Bitmap subfield of the BA Information field of the [Compressed->Multi-STA] BlockAck frame is 8 octets in length and is used to indicate the received status of up to 64 MSDUs and A-MSDUs." | REVISED. Please see below. |
| 1288 | Mark RISON | | 19.32 | "for 4 fragments of each of the 16 MSDUs" -- the MSDUs might not be fragmented into 4 fragments | Change to "for the up to the 4 fragments of each of the 16 MSDUs" | REVISED. Please see below. |
| 1814 | Rojan Chitrakar | | 19.31 | "16 subbitmaps", "16 MSDUs" may no longer be valid since the bitmap length may vary. | Change 16 to "BA Bitmap length"/4. | REVISED. Please see below. |

##### 9.3.1.9.7 Multi-STA BlockAck variant

[CID80] The format defined below is used for multi-STA multi-TID, and multi-STA single TID BlockAck variant. Multi STA BA frames shall be supported if either UL MU or multi-TID A-MPDU operation is supported.

The TID\_INFO subfield of the BA Control field of the Multi-STA BlockAck frame is reserved. [CID1810]

The BA Information field of the Multi-STA BlockAck frame comprises one or more instances of the Per STA Info subfields. The Per STA Info subfield is shown in Figure 9-37a.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
|  | Per-AID TID Info | Block Ack Starting Sequence Control | Block Ack Bitmap |
| Octets | 2 | 0 or 2 | 0, 4, 8, 16, or 32 |

Figure 9‑37a - Per STA Info subfield format

The Per AID TID Info subfield is shown in Figure 9-37b.

|  |  |  |  |
| --- | --- | --- | --- |
|  | B0 B10 | B11 | B12-B15 |
|  | AID | ACK Type | TID |
| Bits | 11 | 1 | 4 |

Figure 9‑37b - Per AID TID Info subfield format

[CID99] When Multi-STA BlockAck variant is intended for a non-AP STA, the AID field carries the AID of the non-AP STA for which the Per STA Info field is intended. When Multi-STA BlockAck variant is intended for an AP, the AID field is set to 0.

The TID field contains the TID for which the acknowledgement or block acknowledgement contained in the Per AID TID Info subfield applies. [CID80] Note: One or more Per STA Info subfields with same value of the AID subfield and different values of the TID subfields can be present in the Multi-STA BlockAck frame. [CID100]Note: When Multi-STA BlockAck is used to acknowledge a management frame, the TID value is set to 15.

If the ACK Type field is [CID2185]1 and the TID value of the Per AID TID Info subfield is smaller than 8 or equal to 15, then the Block Ack Starting Sequence Control and Block Ack Bitmap are not present and the Per STA Info field indicates the acknowledgement of successful reception of a single MPDU indicated by TID of the Per AID TID Info subfield. [CID2414, CID2582] If the ACK Type field is 1 and the TID value of the Per AID TID Info subfield is set to 14, then the Block Ack Starting Sequence Control and Block Ack Bitmap are not present and the Per STA Info field indicates the acknowledgement of successful reception of all the MPDUs carried in the eliciting A-MPDU. [CID2232, CID2458] The Ack Type field is not set to 1 when responding to a BlockAckReq frame or an MU-BAR. If the ACK Type subfield is 0, then the Block Ack Starting Sequence Control and Block Ack Bitmap fields are present.

[CID98, CID508, CID1811] If the ACK Type field is 0, the Fragment Number subfield is set as follows:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table 9-y (Mapping for the Fragment Number subfield of the Compressed BlockAck variant) | | | | | |
| **Fragment Number subfield** | | | **Fragmentation Level-3: [ON/OFF]** | **BA Bitmap Length field [Octets]** | **Maximum number of MSDUs/A-MSDUs that can be acknowledged** |
| **B3** | **B2-B1** | **B0** |  |
| 0 | 0 | 0 | OFF | 8 Octets | 64 |
| 0 | 1 | 0 | 16 Octets | 128 |
| 0 | 2 | 0 | 32 Octets | 256 |
| 0 | 3 | 0 | 4 Octets | 32 |
| 0 | 0 | 1 | ON | 8 Octets | 16 |
| 0 | 1 | 1 | 16 Octets | 32 |
| 0 | 2 | 1 | 32 Octets | 64 |
| 0 | 3 | 1 | 4 Octets | 8 |
| 1 | Any | Any |  | Reserved | |
| NOTE—A Multi-STA Block Ack frame with the LSB of the Fragment Number subfield set to 1 can only be sent to an HE STA whose HE Fragmentation Support subfield in the HE Capabilities element it transmits is 3 (see 25.3 (Fragmentation)). | | | | | |

When B0 of the Fragment Number subfield is 0[CID1182, CID962, CID1812], the Block Ack Starting Sequence Control subfield is as shown in Figure 9-27. The Block Ack Bitmap subfield of the BA Information field of the Multi-STA BlockAck frame contains an 8-octet block ack bitmap, a 16-octet BlockAck bitmap, a 32-octet BlockAck bitmap, or a 4-octet block ack bitmap based on the value of B2-B1 in the Fragment Number subfield as shown in the Table 9-y[CID1291]. Each bit that is equal to 1 in the Block Ack Bitmap subfield acknowledges the successful reception of a single MSDU or A-MSDU in the order of sequence number with the first bit of the Block Ack Bitmap subfield corresponding to the MSDU or A-MSDU with the sequence number that matches the value of the Starting Sequence Number subfield of the Block Ack Starting Sequence Control subfield.

When B0 of the Fragment Number subfield is 1, the Block Ack Bitmap subfield of the BA Information field of the Multi-STA Block Ack frame is used to indicate the receive status of up to 16, 32, 64, or 8 MSDUs and A-MSDUs depending upon the value of B2-B1 in the Fragment Number subfield as shown in the Table 9-y. Bit position *n* of the Block Ack Bitmap field, if equal to 1, acknowledges receipt of an MPDU with sequence number value, *SN* and fragment number value, *FN* with n equal to 4 × (*SN* – *SSN*) + *FN*, where *SSN* is the value of the Starting Sequence Number subfield of the Block Ack Starting Sequence Control subfield and the operations on the sequence numbers are performed modulo 4096. When bit position *n* of the Block Ack Bitmap field is equal to 0 it indicates that the MPDU has not been received.

NOTE—When the B0 of the Fragment Number subfield is equal to 1 then the [CID1143] Block Ack Bitmap field is split into [CID1875, CID1814] (BA Bitmap length/4) subbitmaps, each of which indicates receive status for [CID1288] up to 4 fragments of each of the MSDUs [CID1813] as indicated in the table 9-y. [CID1287] For an A-MSDU, only the first bit of the subbitmap is used, as fragmentation is not allowed in an A-MSDU.

[CID 2185]

TGax editor: Search the ACK Type field throughout the draft and correct the bit setting to align with the revised definition in subclause 9.3.1.9.7. (Two places in subclause 25.4.1 need to be fixed in D0.1.)

[CID 2414, 2582]

TGax editor: Add the following sentence in 25.1:

The use of HCCA and TSPEC are banned at HE STAs.