IEEE P802.11  
Wireless LANs

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | Response to D1p1 TGah comments from 1099 | | | | | | Date: 2018-10-04 | | | | | | Author(s): | | | | | | Name | Affiliation | Address | Phone | email | | Matthew Fischer | Broadcom |  |  | [Matthew.fischer@broadcom.com](mailto:Matthew.fischer@broadcom.com) | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |

Abstract

This document provides proposed responses and draft text changes to TGmd D1.6 that are based on comments submitted outside of the 802.11 WG LB232 process and which appear in 11-18-1099-01-000m-11ah-text-issues. Because these comments were not generated as part of the LB232 process, they do not have CID numbers assigned to them and they do not appear in the official LB232 document 11-18-0611.

The draft of reference for these comments is D1.1, not D1.0 as is the case for LB232 comments.

The proposed changes on this document are based on TGax Draft 1.6.

**REVISION NOTES:**

**R0**:

initial

**R1**:

CR18 – GCMP for S1G comment – had no proposed resolution in R0, now added a resolution which is REJECT with the rationale that the task group did not originally include GCMP use for S1G because the primary reason for introducing GCMP within 802.11 was to facilitate encryption implementations for very high data rates and S1G data rates are incredibly low.

Updated document references.

**R2**:

Modified proposed text changes for Ack Policy bit settings for both PV0 and PV1 frames. Changed ordering and added conditional “otherwise” to improve and correct the logical flow and consistency and readability and ensure that all cases have been addressed.

Slight modification to the wording of the proposed resolution for CR18.

Updated document references.

**R3**:

9.4.2.5.1 – update to D1.6

9.3.1.21 TACK frame format - modified proposed text changes because the conditions for the two paragraphs are identical and the additional interpretation of the field is based on the value of the field, when present.

Ack policy tables – updated to adopted changes from 11-18-1306 for CID 1415 (i.e. edits to create D1.7) – i.e. merged the 1306 changes with the changes from r2 of this doc

Updated document references.

**END OF REVISION NOTES**

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.***

**Comments**

***The first column indicates the row number of the reference document 11-18-1099-000m-01, which is an excel document. Such reference is necessary in place of an official CID for each comment because these “comments” are not part of the official TGmd LB232 process and therefore do not appear in the LB232 excel tracking document and do not have a CID number assigned to them.***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 5 | Dejan Dumic | 9.4.2.5.1 | 916.09 | Figure 9-140 indicates that TIM element has at least 4 bytes which is not in line with statement on page 918, line 11 "When the TIM is carried in an S1G PPDU, if all bits in virtual bitmap are 0, the Partial Virtual Bitmap field is not present in the TIM element and the Length field of the TIM element is set to 3. If all bits in the virtual bitmap are 0 and all the bits of the Bitmap Control field are 0, both the Partial Virtual Bitmap field and the Bitmap Control field are not present in the TIM element and the Length field of the TIM element is set to 2.(11ah)" | Modify Figure 9-140 to represent that fields "Bitmap Control" and "Partial Virtual Bitmap" are not always present | Revise - TGmd editor to make changes to TGmd Draft 1.5 as shown in 11-18/1724r3 that are marked with CR5, which change the field length of Bitmap Control to 0 or 1 and the length of Partial Virtual Bitmap to 0 - 251 |
| 6 | Dejan Dumic | 9.3.1.21 | 784.35 | Missing part of the sentence. In IEEE802.11ah-2016 is written "If the Next TWT Info Present field of the Frame Control field is equal to 1 and the Flow Control field of the Frame Control field is equal to 0, then the Next TWT Info/Suspend Duration field is present and contains the value of the 45 MSBs of the lowest 6 octets of the TSF timer corresponding to the next scheduled TWT SP for the TWT agreement identified by the TWT Flow Identifier subfield for the STA that is the intended recipient of the frame." and in Draft802.11revmd\_d1.1 is stated "Frame Control field is equal to 0, then the Next TWT Info/Suspend Duration field is present and contains the value of the 45 MSBs of the lowest 6 octets of the TSF timer corresponding to the next scheduled TWT SP for the TWT agreement identified by the TWT Flow Identifier subfield for the STA that is the intended recipient of the frame.". | Add missing part of the sentence "If the Next TWT Info Present field of the Frame Control field is equal to 1 and the Flow Control field of the " | Revise - TGmd editor to make changes as shown in 11-18/1724r3 that are marked with CR6, which add the missing text as suggested by the commenter. |
| 7 | Dejan Dumic | 9.3.1.21 | 784.43 | It should refer to case when first 45 bits which represent Next TWT are all 0, not when all bits in field are set to 0 | Change "Next TWT Info/Suspend Duration subfield" to "Next TWT subfield" | Revise - TGmd editor to make changes as shown in 11-18/1724r3 that are marked with CR7, which reference the correct field name as suggested by the commenter. |
| 8 | Dejan Dumic | 9.4.2.199.3 | 1307.01 | Overlaping figure 9-672 and Table 9-2389 |  | Revise – TGmd D1.5 already fixes the problem of the overlapping table and figure. |
| 9 | Dejan Dumic | 9.9.2.4.2 | 1554.04 | It is not clear which bits of FCS should be used for generating ACK ID in NDP\_1M ACK. For 1MHz NDP ACK "The Ack ID field is set to the bit sequence Scrambler Initialization [0:6] || FCS[30:31] obtained from the scrambler initialization value in the Service field (as defined in 23.3.9.2 (SERVICE field)) prior to descrambling, and the FCS field of the PSDU that carries the soliciting frame. " According to the conventions FCS should be transmitted commencing with the coefficient of the highest-order term. Which is the highest bit of the FCS field? When generating the ACK ID field, should we take the received or transmitted order of the FCS? | Provide an example where it is demonstrated which FCS bits shall be used. | Reject – the numbering of the bits of the FCS field are unambiguous as per 9.2.4.8 FCS field and the reference mentioned in 9.2.1 Basic Components (i.e. ITU-T V.42) |
| 10 | Dejan Dumic | 9.9.2.4.3 | 1554.46 | It is not clear which bits of FCS should be used for generating ACK ID in NDP\_2M ACK. For 2MHz NDP ACK "The Ack ID field is set to the bit sequence Scrambler Initialization [0:6] || FCS[23:31] obtained from the scrambler initialization value in the Service field (as defined in 23.3.9.2 (SERVICE field)) prior to descrambling, and the FCS field of the PSDU that carries the soliciting frame. " According to the conventions FCS should be transmitted commencing with the coefficient of the highest-order term. Which is the highest bit of the FCS field? When generating the ACK ID field, should we take the received or transmitted order of the FCS? | Provide an example where it is demonstrated which FCS bits shall be used. | Reject – the numbering of the bits of the FCS field are unambiguous as per 9.2.4.8 FCS field and the reference mentioned in 9.2.1 Basic Components (i.e. ITU-T V.42) |
| 11 | Dejan Dumic | 9.8.4.2 | 1541.3 | A1 of the STACK frame is defined as "The A1 is an SID field that contains the AID of the intended recipient of the frame in the AID subfield. " which means that STACK frame cannot be transmitted to AP because it doesn’t have AID. | Define version of the STACK frame that can address AP | Revise - TGmd editor to make changes as shown in 11-18/1724r3 that are marked with CR11, which prescribe a value of 0 to be used for A1 for the frame when it is transmitted to an AP. |
| 12 | Dejan Dumic | 9.8.4.3 | 1542.17 | A1 of the BAT frame is defined as "The A1 is an SID field that contains the AID of the intended recipient of the frame in the AID subfield. " which means that BAT frame cannot be transmitted to AP because it doesn’t have AID. | Define version of the BAT frame that can address AP. Potential solution is to follow address mechanism of PV1 management frames. | Revise - TGmd editor to make changes as shown in 11-18/1724r3 that are marked with CR12, which prescribe a value of 0 to be used for A1 for the frame when it is transmitted to an AP. |
| 13 | Dejan Dumic | 9.2.4.5.4 | 742.08 | When ACK Policy bits in QoS Control field are set to 00, both originator and addressed recipient support fragment BA procedure and non-A-MPDU frame that doesn’t contain fragment is transmitted, behaviour of addressed recipient is not clear. It looks like that this fits in Otherwise case and addressed recipient should react with BlockAck frame. | Describe behaviour of the addressed recipient in this scenario. | Revise - TGmd editor to make changes as shown in 11-18/1724r3 that are marked with CR13, which modify table 9-13 by explicitly naming the non-fragment case and by explicitly naming STACK, TACK and BAT as response choices and by including references to 10.48.2 (TWT acknowledgement procedure) |
| 14 | Dejan Dumic | 9.8.3.2 | 1539.07 | Behaviour of addressed recipient is not clear when it receives PV1 non-A-MPDU frame that is not a fragment and both originator and addressed recipient support fragment BA. | Describe behaviour of the addressed recipient in this scenario. | Revise - TGmd editor to make changes as shown in 11-18/1724r3 that are marked with CR14, which modify table 9-536 by explicitly naming the non-fragment case and by explicitly naming STACK, TACK and BAT as response choices and by including references to 10.48.2 (TWT acknowledgement procedure) |
| 15 | Dejan Dumic | 10.6.6.6 | 1633.18 | If AP is using 2MHz primary channel it is not clear which channel should be used for 1MHz Control response. | Provide an explanation of this scenario. | Reject – the channel to use for the 1 MHz control response is clear, but the rule is located elsewhere, see 10.47.1 Basic S1G BSS functionality (i.e. it is restricted to the primary channel) |
| 16 | Dejan Dumic | 9.9.2.3.1 | 1551.64 | NDP\_1M PS-Poll has Partial AID for TA and AP cannot uniquely determine which STA is transmitting the NDP PS-Poll frame and therefore cannot send BU. | Modify NDP\_1M PS-Poll frame so it contains full AID so AP can uniquely determine which is transmitting STA. | Reject – the existing PS POLL frame allows for an unambiguous AID value and may be used instead of the NDP PS POLL, if the transmitting STA chooses. Additionally, the AP has the ability to indicate that NDP PS POLL transmissions are not allowed within the BSS. While not explicitly specified, it is likely that an AP that permits the use of NDP PS POLL will only do so if it does not assign AID values beyond the carrying capacity of the NDP PS POLL, thereby making the use of the NDP PS POLL unambiguous. |
| 17 | Dejan Dumic | 9.9.2.3.2 | 1553.01 | NDP\_2M PS-Poll has Partial AID for TA and AP cannot uniquely determine which STA is transmitting the NDP PS-Poll frame and therefore cannot send BU. | Modify NDP\_2M PS-Poll frame so it contains full AID so AP can uniquely determine which is transmitting STA. | Reject – the existing PS POLL frame allows for an unambiguous AID value and may be used instead of the NDP PS POLL, if the transmitting STA chooses. Additionally, the AP has the ability to indicate that NDP PS POLL transmissions are not allowed within the BSS. While not explicitly specified, it is likely that an AP that permits the use of NDP PS POLL will only do so if it does not assign AID values beyond the carrying capacity of the NDP PS POLL, thereby making the use of the NDP PS POLL unambiguous. |
| 18 | Dejan Dumic | 12.5.5 | 2362.52 | GCMP is not defined for PV1 frames | Define GCMP for PV1 frames | Reject – the group did not include GCMP in the S1G specification because GCMP was primarily introduced into 802.11 for the reason that it allowed higher data rates to be more practically encrypted and S1G data rates are quite low compared to nearly all defined 802.11 PHYs and therefore S1G did not need the faster encryption algorithm. |

**Discussion:**

xxxx

**Proposed Changes to Draft Text of TGmd D1.5:**

**9.4.2.5 TIM element**

**9.4.2.5.1 General**

***TGmd editor: change the Octet counts of Figure 9-148 – TIM element format as shown:***

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Element ID | Length | DTIM Count | DTIM Period | Bitmap Control | Partial Virtual Bitmap |
| Octets: | 1 | 1 | 1 | 1 | 0 or 1 | 0 – 251 **(#CR5)** |

**Figure 9-149 – TIM element format**

**9.3.1.21 TACK frame format**

***TGax editor: modify the text as shown:***

If the Next TWT Info Present field of the Frame Control field is equal to 1 and the Flow Control field of the Frame Control field is equal to 0, then the Next TWT Info/Suspend Duration field is present and contains either the value 0 or the value of the 45 MSBs of the lowest 6 octets of the TSF timer corresponding to the next scheduled TWT SP for the TWT agreement identified by the TWT Flow Identifier subfield for the STA that is the intended recipient of the frame. If the value of the Next TWT Info/Suspend Duration field is 0, the transmitter does not currently have a Next TWT value available for transmission for the TWT agreement identified by the TWT Flow Identifier subfield for the STA that is the intended recipient of the frame. **(#CR6) (#CR7)**

**9.8.4.2 STACK frame format**

***TGax editor: modify the text as shown:***

The A1 field is an SID field that contains the AID of the intended recipient of the frame in the AID subfield when the intended recipient is not an AP and the value 0 when the intended receipient is an AP. A3 Present, A4 Present and A-MSDU subfields (B13, B14, and B15) of the SID field are reserved. **(#CR11)**

**9.8.4.3 BAT frame format**

***TGax editor: modify the text as shown:***

The A1 field is an SID field that contains the AID of the intended recipient of the frame in the AID subfield when the intended recipient is not an AP and the value 0 when the intended receipient is an AP. A3 Present, A4 Present and A-MSDU subfields (B13, B14, and B15) of the SID field are reserved. **(#CR12)**

**10.48.2 TWT acknowledgement procedure**

***TGax editor: add the following text to become the new second from last paragraph of subclause 10.48.2 TWT acknowledgement procedure, as shown:***

If the intended recipient of a STACK or BAT frame is an AP, then the A1 field of the frame shall be set to 0. **(#CR11)(#CR12)**

**9.2.4.5.4 Ack Policy subfield**

***TGax editor: modify the text from Table 9-13 – Ack Policy subfield in QoS Control field of QoS Data frames as shown:***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | * Ack policy~~Policy subfield in QoS Control field of QoS Data frames~~ | | | |
| Ack policy | Bits in QoS Control field | | | Other conditions | Meaning |
|  | Bit 5 | | Bit 6 |  |
| Normal Ack | 0 | | 0 | MPDU is a non-A-MPDU frame | ~~Normal Ack or Implicit Block Ack Request.~~  ~~In a frame that is a non-A-MPDU frame:~~  ~~w~~Where the frame does contain a fragment where both the originator and the addressed recipient support the fragment BA procedure:  The addressed recipient returns an NDP BlockAck or BAT frame after a SIFS according to the procedures defined in 10.3.2.12 (Fragment BA procedure(11ah)) and 10.48.2 (TWT acknoweldgement procedure). **(CR#13)**  Where the frame does not contain a fragment, or either the originator or the addressed recipient does not support the fragment BA procedure:  The addressed recipient returns an Ack, STACK **(CR#13)** or QoS +CF-Ack frame after a short interframe space (SIFS) period, according to the procedures defined in 10.3.2.11 (Acknowledgment procedure), 10.48.2 (TWT acknoweldgement procedure) **(CR#13)** and 10.24.3.5 (HCCA transfer rules). A non-DMG STA uses this ack policy ~~sets the Ack Policy subfield~~ for individually addressed QoS Null (no data) frames ~~to this value~~.  ~~In a non-A-MPDU frame containing a fragment wOtherwise:~~  ~~The addressed recipient returns an NDP BlockAck frame after a SIFS, according to~~  ~~the procedure defined in 10.3.2.12 (Fragment BA procedure(11ah)).~~  ~~Otherwise:~~  ~~The addressed recipient returns a BlockAck frame, either individually or as part of an A-MPDU starting a SIFS after the PPDU carrying the frame, according to the procedures defined in 10.3.2.9 (Acknowledgment procedure), 10.24.7.5 (Generation and transmission of BlockAck frames by an HT STA or DMG STA), 10.24.8.3 (Operation of HT-delayed block ack), 10.28.3 (Rules for RD initiator), 10.28.4 (Rules for RD responder), and 10.32.3 (Explicit feedback beamforming).~~ |
| Implicit BAR | 0 | | 0 | MPDU is not a non-A-MPDU frame  NOTE—This MPDU is sent under a block ack agreement. | The addressed recipient returns a BlockAck, TACK or BAT**(#CR13)** frame, either individually or as part of an A-MPDU starting a SIFS after the PPDU carrying the frame, according to the procedures defined in 10.3.2.11 (Acknowledgment procedure), 10.26.6.5 (Generation and transmission of BlockAck frames by an HT STA or DMG STA), 10.26.7.3 (Operation of HT-delayed block ack), 10.30.3 (Rules for RD initiator), 10.30.4 (Rules for RD responder), 10.48.2 (TWT acknoweldgement procedure), and 10.35.3 (Explicit feedback beamforming). |
| No Ack | 1 | | 0 | None | ~~No Ack~~  The addressed recipient takes no action upon receipt of the frame. More details are provided in 10.25 (No Acknowledgment (No Ack)).  This ack policy is used ~~The Ack Policy subfield is set to this value~~ in all individually addressed frames in which the sender does not require acknowledgment. It is also used ~~The Ack Policy subfield is also set to this value~~ in all group addressed frames that use the QoS frame format except QoS Data frames with a TID for which a block ack agreement exists.  It ~~This value of the Ack Policy subfield~~ is not used for QoS Data frames with a TID for which a block ack agreement exists.  ~~The Ack Policy subfield for group addressed QoS Null (no data) frames is set to this value.~~ |
| No Explicit Acknowledgment | 0 | | 1 | Bit 6 of the Frame Control field (see 9.2.4.1.3 (Type and Subtype subfields)) is equal to 1 | ~~No explicit acknowledgment or PSMP Ack.~~  ~~When bit 6 of the Frame Control field (see 9.2.4.1.3 (Type and Subtype subfields)) is set to 1:~~  There might be a response frame to the frame that is received, but it is neither the Ack frame nor any Data frame of subtype +CF-Ack.  The Ack Policy subfield for QoS CF-Poll and QoS CF-Ack +CF-Poll Data frames is set to this value.  ~~When bit 6 of the Frame Control field (see 9.2.4.1.3 (Type and Subtype subfields)) is set to 0:~~  ~~The acknowledgment for a frame indicating PSMP Ack when it appears in a PSMP downlink transmission time (PSMP-DTT) is to be received in a later PSMP uplink transmission time (PSMP-UTT).~~  ~~The acknowledgment for a frame indicating PSMP Ack when it appears in a PSMP-UTT is to be received in a later PSMP-DTT.~~  NOTE—Bit 6 of the Frame Control field (see 9.2.4.1.3 (Type and Subtype subfields)) indicates the absence of a ~~data~~ Frame Body field in a QoS Data frame. When equal to 1, the QoS Data frame contains no Frame Body field, and any response is generated in response to a QoS CF-Poll or QoS CF-Ack +CF-Poll frame, but does not signify an acknowledgment of data. ~~When set to 0, the QoS Data frame contains a Frame Body field, which is acknowledged as described in 10.29.2.7 (PSMP acknowledgment rules).~~ |
| PSMP Ack | 0 | | 1 | Bit 6 of the Frame Control field (see 9.2.4.1.3 (Type and Subtype subfields)) is equal to 0 | The acknowledgment for a frame indicating PSMP Ack when it appears in a PSMP downlink transmission time (PSMP-DTT) is to be received in a later PSMP uplink transmission time (PSMP-UTT).  The acknowledgment for a frame indicating PSMP Ack when it appears in a PSMP-UTT is to be received in a later PSMP-DTT.  See 10.31.2.7 (PSMP acknowledgment rules). |
| Block Ack | 1 | | 1 | None | ~~Block Ack~~  The addressed recipient takes no action upon the receipt of the frame except for recording the state. The recipient can expect a BlockAckReq frame or implicit block ack request in the future to which it responds using the procedure described in 10.26 (Block acknowledgment (block ack)). |

**9.8.3.1 Frame Control field**

***TGax editor: modify the text from Table 9-536—Ack Policy subfield in the Frame Control field for PV1 frames as shown:***

|  |  |  |  |
| --- | --- | --- | --- |
| Ack policy | Ack ~~Policy~~$noun subfield | Other conditions | Meaning |
| Normal Ack | 0 | MPDU is non-A-MPDU frame | ~~Normal Ack or Implicit Block Ack Request.~~  ~~In a PV1 frame that is a non-A-MPDU frame (#233)w~~Where the frame does contain a fragment and both the originator and the addressed recipient support the fragment BA procedure:  The addressed recipient returns an NDP BlockAck or BAT frame after a SIFS, according to the procedures defined in 10.3.2.12 (Fragment BA procedure(11ah)) and 10.48.2 (TWT acknoweldgement procedure). **(#CR14)**  Where the frame does not contain a fragment, or either the originator or the addressed recipient does not support the fragment BA procedure:  The addressed recipient returns an Ack, TACK or STACK**(#CR14)** frame after a short interframe space (SIFS) period, according to the procedures defined in ~~10.3.2.10 (Dual CTS protection)~~10.3.2.11 (Acknowledgment procedure) and 10.48.2 (TWT acknoweldgement procedure). **(#CR14)**  ~~In a PV1 frame that is part of an A-MPDU that is not an S-MPDU:~~  ~~The addressed recipient returns a BlockAck frame, either individually or as part of an A-MPDU starting a SIFS after the PPDU carrying the frame, according to the procedures defined in 10.3.2.10 (Dual CTS protection), and 10.26.7.3 (Operation of HT-delayed block ack).~~  ~~In a PV1 frame that is a fragment:~~  ~~When both the originator and the addressed recipient support the fragment BA procedureOtherwise, the addressed recipient returns an NDP BlockAck frame after a SIFS, according to the procedure defined in 10.3.2.12 (Fragment BA procedure(11ah)).~~ **(#CR14)**  Ack ~~Policy~~$noun 0 is limited to at most one MU recipient per MU PPDU. |
| Implicit BAR | 0 | MPDU is not a non-A-MPDU frame | The addressed recipient returns a BlockAck or BAT**(#CR14)** frame, either individually or as part of an A-MPDU starting a SIFS after the PPDU carrying the frame, according to the procedures defined in 10.3.2.11 (Acknowledgment procedure), 10.48.2 (TWT acknoweldgement procedure) **(#CR14)** and 10.26.7.3 (Operation of HT-delayed block ack). |
| No Ack | 1 | MPDU is non-A-MPDU frame | ~~No Ack or Block Ack Policy.~~  ~~In a PV1 frame that is a non-A-MPDU frame(#233):~~  The addressed recipient takes no action upon receipt of the frame. More details are provided in 10.27 (No Acknowledgment (No Ack)). This ack policy is used ~~The Ack Policy subfield is set to this value~~ in all individually addressed frames in which the sender does not require acknowledgment. It is also used ~~The Ack Policy subfield is also set to this value~~ in all group addressed frames. It ~~This combination~~ is not used for PV1 Data frames with a TID for which a ~~B~~**b**lock ~~A~~ack agreement exists.  ~~In a PV1 frame that is part of an A-MPDU frame that is not an S-MPDU:~~  ~~The addressed recipient takes no action upon the receipt of the frame except for recording the state. The recipient can expect a BlockAckReq frame in the future to which it responds using the procedure described in 10.26 (Block acknowledgment (block ack)).~~ |
| Block Ack | 1 | MPDU is not a non-A-MPDU frame | The addressed recipient takes no action upon the receipt of the frame except for recording the state. The recipient can expect a BlockAckReq frame in the future to which it responds using the procedure described in 10.26 (Block acknowledgment (block ack)). |

**End of proposed changes.**