IEEE P802.11  
Wireless LANs

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| **TGbn D0.1 Comment Resolution for A-MPDU (9.7)** |
| **Date:** 2025-04-17 |

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Abstract

This submission proposes resolutions for the following 7 CIDs received for TGbn CC50 Comment Resolution:

* 1405, 1467, 1902, , 1943, 2102, 2103, 2104

Revisions:

- Rev 0: Initial version of the document.

- Rev 1: Remove CID 1925

- Rev 2: Modify typos based on feedbacks during the presentation

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 TGbn Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbn Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGbn Editor: Editing instructions preceded by “TGbn Editor” are instructions to the TGbn editor to modify existing material in the TGbn draft. As a result of adopting the changes, the TGbn editor will execute the instructions rather than copy them to the TGbn Draft.***

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| --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause**  **(page.line)** | **Comment** | **Proposed Change** | **Resolution** |
| 1405 | SunHee Baek | 9.7  (64.01) | The contents of UHR PPDU need to be added to the clause. | as in the comment. | **Revised**  Agree in principle with the commenter.  The UHR PPDU is added to the sections of 9.7.1 and 9.7.3.  **TGbn editor, please make the changes tagged by CID #1405 in this document.** |
| 1467 | Akira Kishida | 9.7  (65.44) | "an UHR" -> "a UHR" | "a UHR" should be correct.  (Or please clarify which expression is correct, "a UHR" and "an UHR") | **Accepted** |
| 1902 | Hyeonjun Sung | 9.7.3  (64.17) | Table 9-660 cannot cover the UHR variant. | Please revise the contents.  The A-MPDU is transmitted by a STA that is neither a TXOP  holder nor an RD responder, or the A-MPDU is transmitted by  an HE AP in response to an HE TB PPDU, an EHT AP in  response to an EHT TB PPDU, or a UHR AP in response to an UHR TB PPDU, and the transmitter also needs to transmit one of the following immediate response frames | **Revised**  Agree in principle with the commenter.  “a UHR AP in response to a UHR TB PPDU” is added to Table 9-660.  **TGbn editor, please incorporate the changes tagged by CID #1405 in this document.** |
|  |  |  | ". |  |  |
| 1943 | Hyeonjun Sung | 9.7.3  (65.15) | Table 9-663 is not covered an UHR variant. | Please revise the contents.  ...  Multi-STA BlockAck frame if the preceding PPDU:  -- is either an HE, EHT, or UHR TB PPDU that solicits an immediate response  (see 26.4.4.5 (Responding to an HE TB PPDU with an SU PPDU)),  -- or an HE, EHT or UHR PPDU that carries a multi-TID A-MPDU or ackenabled  multi-TID A-MPDU (see 26.6.3 (Multi-TID AMPDU and ackenabled  single-TID AMPDU)).,  ... | **Revised**  Agree in principle with the commenter.  Table 9-663 is updated to cover the UHR variant.  **TGbn editor, please incorporate the changes tagged by CID #1405 in this document.** |
| 2102 | Vishnu Ratnam | 9.7.3  (64.17) | The text in Table 9-660 reads: "The A-MPDU is transmitted by a STA that is neither a TXOP holder nor an RD responder, or the A-MPDU is transmitted by an HE AP in response to an HE TB PPDU, or an EHT AP in response to an EHT TB PPDU, and the" which doesn't include case of UHR TB PPDU. Suggest to replace with: "The A-MPDU is transmitted by a STA that is neither a TXOP holder nor an RD responder, or the A-MPDU is transmitted by an HE AP in response to an HE TB PPDU, or an EHT AP in response to an EHT TB PPDU, or a UHR AP in response to a UHR TB PPDU, and the". | As in comment. | **Accepted** |
| 2103 | Vishnu Ratnam | 9.7.3  (65.15) | The text in the second column of Table 9-663 reads: "is either an HE or EHT TB PPDU that solicits an immediate response". Replace with "is either an HE or EHT TB PPDU or UHR TB PPDU that solicits an immediate response" | As in comment. | **Revised**  Agree in principle with the commenter.  Table 9-663 is updated to cover the UHR variant.  **TGbn editor, please incorporate the changes tagged by CID #1405 in this document.** |
| 2104 | Vishnu Ratnam | 9.7.3  (65.20) | The text in the second column of Table 9-663 reads: "or an HE or EHT PPDU that carries a multi-TID A-MPDU or ack-enabled". Replace with "or an HE or EHT PPDU or UHR PPDU that carries a multi-TID A-MPDU or ack-enabled" | As in comment. | **Revised**  Agree in principle with the commenter.  Table 9-663 is updated to cover the UHR variant.  **TGbn editor, please incorporate the changes tagged by CID #1405 in this document.** |

**Propose:**

***TGbn editor: Please note that the baseline is 11be D7.0. and 11bn D0.2***

**9.7 Aggregate MPDU (A-MPDU)**

***TGbn editor: Please modify the subclause 9.7.1 (A-MPDU format) in the context of 9.7 (A-MPDU) as follows***

**9.7.1 A-MPDU format**

The EOF Padding field is shown in Figure 9-1324 (EOF Padding field format). This is present only in a VHT, EDMG, S1G, HE, (#1405) EHT, or UHR PPDU.

In a VHT, EDMG, S1G, HE,(#1405) EHT, or UHR PPDU, the following padding is present, as determined by the rules in 10.12.6 (A-MPDU padding for VHT, HE, EHT or S1G PPDU):

* 0–3 octets in the Padding subfield of the final A-MPDU subframe (see Figure 9-1325 (A-MPDU subframe format)) before any EOF padding subframes. The content of these octets is unspecified.
* Zero or more EOF padding subframes in the EOF Padding Subframes subfield.
* 0–3 octets in the EOF Padding Octets subfield. The content of these octets is unspecified.

The maximum length of an A-MPDU in an HT PPDU is 65 535 octets. The maximum length of an A-MPDU in a DMG PPDU is 262 143 octets. The maximum length of an A-MPDU pre-EOF padding in a VHT PPDU is 1 048 575 octets. The maximum length of an A-MPDU pre-EOF padding in an HE PPDU is 6 500 631 octets. The maximum length of an A-MPDU in an EDMG PPDU is 4 194 303 octets. The maximum length of an A-MPDU pre-EOF padding in an EHT(#1405) and a UHR PPDU is 15 523 200 octets. The length of an A-MPDU addressed to a particular STA can be further constrained as described in 10.12.2 (A-MPDU length limit rules).

***TGbn editor: Change Table 9-659 (MPDU delimiter fields) as follows:***

**Table 9-659 – MPDU delimiter fields**

|  |  |  |
| --- | --- | --- |
| Field | Size (bits) | Descriptions |
| EOF/Tag | 1 | End of frame indication if the MPDU Length field is 0. Set to 1 in an A-MPDU subframe that has 0 in the MPDU Length field and that is used to pad the A-MPDU in a VHT, HE,(#1405) EHT, or UHR PPDU as described in 10.12.6 (A-MPDU padding for VHT, HE, EHT or S1G PPDU). Set to 1 in the MPDU delimiter of an S-MPDU as described in 10.12.7 (Setting the EOF/Tag field of the MPDU delimiter).  Tagged/untagged indication if the MPDU Length field is nonzero. Set to 1 in an MPDU delimiter preceding a QoS Data frame or Management frame soliciting an Ack frame or Per AID TID Info field with the Ack Type field set to 1 in a Multi-STA BlockAck frame in a response that is contained in an ack-enabled multi-TID A-MPDU as described in 26.6.3.4 (Ack-enabled multi-TID A-MPDU operation) and ack-enabled single-TID A-MPDU as described in 26.6.3.2 (Ack-enabled single-TID A-MPDU operation). Set to 0 otherwise.  In a DMG PPDU, this field is reserved. In an EDMG PPDU, it is set to 1 in EOF padding subframes and set to 0 otherwise (see 10.12.7 (Setting the EOF/Tag field of the MPDU delimiter)). |
| Reserved | 1 |  |
| MPDU Length | 14 | Length of the MPDU in octets. Set to 0 if no MPDU is present. An A-MPDU subframe with 0 in the MPDU Length field is used as defined in 10.12.3 (Minimum MPDU start spacing rules) to meet the minimum MPDU start spacing requirement and also to pad the A-MPDU to fill the available octets in a VHT, HE,(#1405) EHT, or UHR PPDU as defined in 10.12.6 (A-MPDU padding for VHT, HE, EHT, or S1G PPDU). |
| CRC | 8 | 8-bit CRC of the preceding 16 bits. |
| Delimiter Signature | 8 | Pattern that can be used to detect an MPDU delimiter when scanning for an MPDU delimiter. The unique pattern is 0x4E, which is the ASCII value of the character 'N'. |

The format of the MPDU Length field when transmitted by a non-DMG STA is shown in Figure 9-1327 (MPDU Length field format (non-DMG)). The MPDU Length Low subfield contains the 12 low order bits of the MPDU length. In a VHT, HE, (#1405)EHT, or UHR PPDU, the MPDU Length High subfield contains the two high order bits of the MPDU length. In an HT PPDU, the MPDU Length High subfield is reserved.

(9-13)

NOTE 2—The format of the MPDU Length field maintains a common encoding structure for HT, VHT, HE,(#1405) EHT, UHR PPDUs. For HT PPDUs, only the MPDU Length Low subfield is used, while for VHT, HE,(#1405) EHT, and UHR PPDUs, both subfields are used.

***TGbn editor: Please modify the subclause 9.7.3 (A-MPDU contents) in the context of 9.7 (A-MPDU) as follows***

**9.7.3 A-MPDU contents**

In a non-DMG PPDU, an A-MPDU is a sequence of A-MPDU subframes carried in a single PPDU with one of the following combinations of RXVECTOR or TXVECTOR parameter values:

* The FORMAT parameter set to VHT
* The FORMAT parameter set to HT\_MF or HT\_GF and the AGGREGATION parameter set to 1
* The FORMAT parameter set to S1G, S1G\_DUP\_1M, or S1G\_DUP\_2M and the AGGREGATION parameter set to 1
* The FORMAT parameter set to HE\_SU, HE\_MU, HE\_TB, or HE\_ER\_SU
* The FORMAT parameter set to NGV
* The FORMAT parameter set to EHT\_MU or EHT\_TB
* (#1405)The FORMAT parameter set to UHR\_MU, UHR\_ELR or UHR\_TB

The Duration/ID fields in the MAC headers of all MPDUs in an A-MPDU carry the same value. The Duration/ID fields in the MAC headers of the MPDUs in the A-MPDUs carried in a VHT(#1405), an HE , an EHT, and a UHR MU PPDU carry the same value.

A VHT(#1405), S1G, HE, EHT, and UHR MU PPDU do not carry more than one A-MPDU that contains one or more MPDUs soliciting an immediate response if the immediate response is carried in a PPDU that is(#1405) not an HE,an EHT,or a UHR TB PPDU. An HE(#1405), an EHT , and a UHR MU PPDU can carry more than one A-MPDU each of which contains one or more MPDUs soliciting an immediate response if the immediate response is carried in an HE(#1405), an EHT, or a UHR TB PPDU.

NOTE 4—If a STA supports A-MSDUs of 7935 octets (indicated by the Maximum A-MSDU Length field in the HT Capabilities element or in a Reconfiguration Multi-Link element with Reconfiguration Operation Type subfield in the STA Control field equal to 1 and Maximum A-MSDU Length Present subfield in the STA Info field equal to 1 (see 35.3.6.6 (Non-AP MLD operation parameter update))), A-MSDUs transmitted by that TA within an A-MPDU carried in a PPDU with FORMAT HT\_MF or HT\_GF or within an MPDU carried in a non-HT PPDU are constrained so that the length of the QoS Data frame carrying the A-MSDU is no more than 4095 octets. The 4095-octet MPDU length limit does not apply to A-MPDUs carried in VHT, HE, EHT(#1405), UHR or DMG PPDUs. The use of A-MSDU within A-MPDU might be further constrained as described in 9.4.1.13 (Block Ack Parameter Set field) through the operation of the A-MSDU Supported field.

***TGbn editor: Change Table 9-660 (A-MPDU contexts) (only relevant rows shown) as follows:***

**Table 9-660 – A-MPDU contexts**

|  |  |  |
| --- | --- | --- |
| **Name of context** | **Definition of context** | **Table defining permitted contents** |
| … | … | … |
| Control Response | The A-MPDU is transmitted by a STA that is neither a TXOP holder nor an RD responder, or the A-MPDU is transmitted by an HE AP in reponse to an HE TB PPDU,(#1405) an EHT AP in response to an EHT TB PPDU, or a UHR AP in response to a UHR TB PPDU, and the transmitter also needs to transmit one of the following immediate response frames:   * Ack frame * BlockAck frame with a TID for which an HT-immediate block ack agreement exists * Multi-STA BlockAck frame for acknowledging multi-TID A-MPDU or reporting unavailability feedback | Table 9-663 (A-MPDU contents in the control response context) |
| S-MPDU context | The A-MPDU is transmitted within a VHT, an HE, an EHT, or a UHR PPDU and contains an S-MPDU | Table 9-664 (A-MPDU contents in the S-MPDU context) |
| … | … | … |

***TGbn editor: Change Table 9-663 (A-MPDU contents in the control response context) (only relevant rows shown) as follows:***

**Table 9-663 – A-MPDU contents in the control response context**

|  |  |  |
| --- | --- | --- |
| MPDU | Conditions | |
| Ack | Ack frame transmitted in response to an MPDU that requires an Ack frame. | One of Ack and compressed BlockAck frame is present at the start of the A-MPDU between two STAs that are not both HE STAs; these are not present other than at the start of the A-MPDU.  One of Ack, Compressed BlockAck, and Multi-STA BlockAck frame is present at the start of the A-MPDU between two HE STAs; these are not present other than at the start of the A-MPDU. |
| BlockAck | Compressed BlockAck frame with a TID that corresponds to an HT-immediate block ack agreement. See NOTE.  Multi-STA BlockAck frame if the preceding PPDU:   * is either an HE(#1405), an EHT, a UHR TB PPDU that solicits an immediate response (see 26.4.4.5(Responding to an HE TB PPDU with an SU PPDU)) * or an HE(#1405), an EHT, or a UHR PPDU that carries a multi-TID A-MPDU or ack-enabled multi-TID A-MPDU (see 26.6.3 (Multi-TID A-MPDU and ack-enabled single-TID A-MPDU)) * or if any preceding PPDU in the TXOP carried a BSRP Trigger frame addressing a STA that is operating with the DUO mode (see 37.12.2 (Dynamic Unavailibity Operation (DUO) mode)) |
| EDMG Multi-TID BlockAck | If the preceding PPDU that carried a multi-TID A-MPDU contains an implicit or explicit block ack requests for multiple TIDs for which an HT-immediate block ack agreement exists, one or several copies of the same EDMG Multi-TID BlockAck frame. |
| … | … | |
| QoS Null frame  with No Ack ack  policy | If sent to an HE STA, QoS Null frames with No Ack ack policy.  If solicited by a UHR AP's BSRP Trigger frame that allows inclusion of unavailability feedback (see 37.12.2 (Dynamic Unavailability Operation (DUO) mode)),  then an additional Multi-STA BlockAck frame is allowed. |  |

***TGbn editor: Change the title of Table 9-665 as follows:***

**Table 9-665—A-MPDU contents in the HE(#1405), EHT, or UHR non-ack-enabled single-TID immediate response context**

***TGbn editor: Change the title of Table 9-666 as follows:***

**Table 9-666—A-MPDU contents in the HE(#1405), EHT, or UHR ack-enabled single-TID immediate response con-text**

***TGbn editor: Change the title of Table 9-667 as follows:***

**Table 9-667—A-MPDU contents in the HE(#1405), EHT, or UHR non-ack-enabled multi-TID immediate response context**

***TGbn editor: Change the title of Table 9-668 as follows:***

**Table 9-668—A-MPDU contents in the HE(#1405), EHT, or UHR ack-enabled multi-TID immediate response con-text**

***TGbn editor: Change the title of subclause 10.12.6 as follows:***

**10.12.6 A-MPDU padding for VHT, HE, EHT(#1405), UHR or S1G PPDU**