IEEE P802.11
Wireless LANs

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| LB225 CR Sub-clause 9.7 Part 1 |
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Abstract

This submission proposes resolutions of comments received from TGax LB225.

(The proposed change is based on TGax Draft 1.0.)

* CIDs: 4754, 6094, 7564, 8404, 8689, 9677, 6480, 7565, 5848, 6481, 8406, 6484, 9611 (13 CID)

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.***

| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| --- | --- | --- | --- | --- | --- |
| 4754 | 107.01 | 9.7.1 | The MPDU length for HE follows the same rules as the one for VHT. Replace "VHT PPDU" with "VHT or HE PPDU" in this equation. | As in comment. | Revised- Agree in principal. Replace “VHT PPDU” with “VHT and HE PPDU”TGax editor makes changes as shown in the as specified in 11-17/0226r0. |
| 6094 | 107.01 | 9.7.1 | The first line should also include HE PPDU, i.e., VHT or HE PPDU, same for Line 14 | Add "or HE" between VHT and PPDU | Revised- Agree in principal. Replace “VHT PPDU” with “VHT and HE PPDU”TGax editor makes changes as shown in the as specified in 11-17/0226r0. |
| 7564 | 107.01 | 9.7.1 | Change "VHT PPDU" to "VHT and HE PPDU" | As in comment | Accepted |
| 8404 | 107.01 | 9.7.1 | The MPDU Length field is used by HE PPDU as well. However, there is no corresponding description in equaltion 9-5. | Add the description for HE PPDU in equation 9-5. | Revised- Agree in principal. Replace “VHT PPDU” with “VHT or HE PPDU”TGax editor makes changes as shown in the as specified in 11-17/0226r0. |
| 8689 | 107.01 | 9.7.1 | Where is HE PPDU in (9-5)? | Change "VHT PPDU" to "VHT and HE PPDU" | Accepted |
| 9677 | 107.01 | 9.7.1 | "Llow + Lhigh x 4096, VHT PPDU"HE PPDU is missing. | Add HE PPDU as well. | Revised- Agree in principal. Replace “VHT PPDU” with “VHT and HE PPDU”TGax editor makes changes as shown in the as specified in 11-17/0226r0. |
| 6480 | 107.03 | 9.7.1 | In equation (9-5), L\_MPDU is defined for VHT, HT, and DMG PPDUs, but not foe HE PPDUs. What is the definition for HE PPDUs? | Modify equation (9-5) to add a definition of L\_MPDU for HE PPDUs. | Revised-Agree in principal. Replace “VHT PPDU” with “VHT and HE PPDU”TGax editor makes changes as shown in the as specified in 11-17/0226r0. |
| 7565 | 107.13 | 9.7.1 | Change the note to "NOTE--The format of the MPDU Length field maintains a common encoding structure for both HE, VHT and HTPPDUs. For HT PPDUs, only the MPDU Length Low subfield is used, while for VHT and HE PPDUs, both subfields are used." | As in comment | Accepted |
| 5848 | 107.14 | 9.7.1 | MPDU Length field description in MPDU delimiter field does not mention HE | Add "HE" as following: "while for VHT and HE PPDUs, both subfields are used." | Accepted |
| 6481 | 107.15 | 9.7.1 | The last sentence of the Note discusses HT and VHT PPDUs, but not HE PPDUs. What pattern is followed by HE PPDUs? | Modify the Note to describe the pattern for HE PPDUs. | Revised-Agree in principal. Replace “VHT PPDU” with “VHT and HE PPDU”TGax editor makes changes as shown in the as specified in 11-17/0226r0. |
| 8406 | 107.35 | 9.7.3 | Can Multi-TID be used in A-MPDU carried in non-HE PPDU such as VHT PPDU, HT PPDU, and non-HT PPDU? From the sentence, it may be implied that the restriction exists. | Directly specify if multi-TID A-MPDU can be carried in non-HE PPDU. From commenter's point of view, the answer is yes as long as the recipient supports multi-TID A-MPDU. | Rejected- Currently, the multi-TID A-MPDU can’t be transmitted in an HT PPDU or a VHT PPDU. I think that there is no technical problem when the multi-TID A-MPDU is transmitted in an HT PPDU or a VHT PPDU.But, such flexibility can makes additional implementation complexity.  |
| 6484 | 107.53 | 9.7.3 | Instead of "(all) HE trigger-based PPDUs addressed to the same AP", it would be more precise to write "HE trigger-based PPDUs transmitted simultaneously to the same AP", or in response to the same HE trigger frame, or something. HE trigger-based PPDUs transmitted at different times do not have to carry the same value, even if they are addressed to the same AP. | Change "all HE trigger-based PPDUs addressed to the same AP" to "HE trigger-based PPDUs transmitted simultaneously to the same AP". | Accepted |
| 9611 | 107.56 | 9.7.3 | The TXVECTOR parameter TXOP\_DURATION of an HE trigger-based PPDU is based on the Duration/ID field in the MAC header.If the Duration/ID fields of one or more HE trigger-based PPDUs addressed to same AP are not identical, the TXVECTOR parameter TXOP\_DURATIONs of those HE trigger-based PPDUs can be different. In such case, 3rd party HE STA can't obtain the TXOP\_DURATION value from the HE-SIG-A of the received HE trigger-based PPDU.Please clearly specify how the Duration/ID field in the MAC header of an HE trigger-based PPDU is calculated. | As per comment. | Revised- Agree in principal. It is necessary to cleary specify how the Duration/ID field in the MAC header of an HE trigger-based PPDU is calculated. TGax editor makes changes as shown in the as specified in 11-17/0226r0. |

***Discussion) CID 9611***

The TXVECTOR parameter TXOP\_DURATION of an HE trigger-based PPDU is determined from the Duration/ID field in the MAC header. And, if the Duration/ID fields of one or more HE trigger-based PPDUs addressed to same AP are not identical, the TXVECTOR parameter TXOP\_DURATIONs of those HE trigger-based PPDUs can be different. In such case, the HE-SIG-A field of an HE trigger-based PPDU can’t be decoded.

For making that the TXVECTOR parameter TXOP\_DURATIONs of those HE trigger-based PPDUs are identical, it is needed to explicitly specify how the Duration/ID field in the MAC header of an HE trigger-based PPDU is calculated.

Proposed options are as the follows:

Option 1)

The Duration/ID fields in the MAC header of an HE trigger-based PPDU shall be set to the value obtained from the Duration/ID field of the frame that elicited the HE trigger-based PPDU, minus one SIFS, minus the TXTIME of the HE trigger-based PPDU.

Option 2)

The Duration/ID fields in the MAC header of an HE trigger-based PPDU shall be set to the value obtained from the Duration/ID field of the frame that elicited the HE trigger-based PPDU, minus one SIFS, minus the RXTIME of the HE trigger-based PPDU.

The TXTIME of an HE trigger-based PPDU is as the following:



The RXTIME of an HE trigger-based PPDU is as the following:


where LENGTH is a value of the Length subfield of the Common Info field in the the received Trigger frame.

When the Option 1 is used, the NAV update of 3rd party STA is as the following:



3rd party STA receiving an HE trigger-based PPDU updates its NAV from the RXVECTOR parameter TXOP\_DURATION after the PHY-RXEND.indication primive is issued. But, because the PHY-RXEND.indication is issued with a delay after the actual TXTIME of the HE trigger-based PPDU, the updated NAV value has much longer than the intended value.

When the Option 2 is used, the NAV update of 3rd party STA is as the following:



3rd party STA receiving an HE trigger-based PPDU updates its NAV from the RXVECTOR parameter TXOP\_DURATION when the PHY-RXEND.indication primive is issued. Because the PHY-RXEND.indication is issued without a delay after the actual RXTIME of the HE trigger-based PPDU, the updated NAV value has the exactly same with the intended value.

As discussed in the above, the option 2 corresponds to the right equation for updating the NAV of 3rd party STA.

* Aggregate MPDU (A-MPDU)

***TGax editor: modify the sub-clause 9.7.1 as the following:***

* A-MPDU format

***TGax editor: change 4th paragraph in the sub-clause 9.7.1 as the following:***

 (#3478)The EOF Padding field is shown in Figure 9-737 (EOF Padding field format(#3478)). This is present only in a VHT or HE (#2481) PPDU.

***TGax editor: change 6th paragraph in the sub-clause 9.7.1 as the following:***

(#3478)In a VHT or HE (#2482) PPDU, the following padding is present, as determined by the rules in 10.13.6 (A-MPDU padding for VHT PPDU(11ac)):

* 0–3 octets in the Padding subfield of the final A-MPDU subframe (see Figure 9-738 (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.

 (11ac)

  ***TGax editor: change Table 9-422 as the following:***

|  |
| --- |
| * MPDU delimiter fields (non-DMG)(11ad)
 |
| Field | Size (bits) | Description |
| EOF(11ac) | 1 | End of frame indication. 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 or HE(#2483) PPDU as described in 10.13.6 (A-MPDU padding for VHT PPDU(11ac)). Set to 1 in the MPDU delimiter of a VHT single MPDU as described in 10.13.7 (Setting the EOF field of the MPDU delimiter(11ac)). Set to 0 otherwise. |
| Reserved | 1(11ac) |  |
| MPDU Length(#6384) | 14(11ac) | 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 10.13.3 (Minimum MPDU Start Spacing field) to meet the minimum MPDU start spacing requirement and also to pad the A-MPDU to fill the available octets in a VHT or HE(#2484) PPDU as defined in 10.13.6 (A-MPDU padding for VHT PPDU(11ac)).(11ac) |
| CRC | 8 | 8-bit CRC of the preceding 16 bits(#6672). |
| Delimiter Signature | 8 | Pattern that can(#7045) be used to detect an MPDU delimiter when scanning for an MPDU(11ac) delimiter.The unique pattern is (#3405)0x4E (see NOTE below)(11ac). |
| NOTE—The ASCII value of the character ‘N’(#7651) was chosen as the unique pattern for the value in the Delimiter Signature field. |

***TGax editor: change 12th paragraph in the sub-clause 9.7.1 as the following:***

The format of the MPDU Length field when transmitted by a non-DMG STA(#6384) is shown in Figure 9-741 (MPDU Length field (non-DMG)(#6384)(11ac)(#3016)). The MPDU Length Low subfield contains the 12 low order bits of the MPDU length. In a VHT or HEPPDU, 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.

***TGax editor: change 13th paragraph in the sub-clause 9.7.1 as the following:***

 (11ac)The MPDU length value is derived from the MPDU Length field subfields as follows:

*L*

*M*

*P*

*D*

*U*

*L*

*l*

*o*

*w*

*L*

*h*

*i*

*g*

*h*

4096



+

VHT and HE PPDU



*L*

*l*

*o*

*w*

HT PPDU



*L*

DMG PPDU













=

where(#6384)

*Llow* is the value of the MPDU Length Low subfield

*Lhigh* is the value of the MPDU Length High subfield

*L* is the value of the MPDU Length field(#6384)

NOTE—The format of the MPDU Length field maintains a common encoding structure for ~~both~~ all VHT, HE and HT PPDUs. For HT PPDUs, only the MPDU Length Low subfield is used, while for VHT and HE PPDUs, both subfields are used.

 (11ac)

* A-MPDU contents

***TGax editor: change 1st paragraph in the sub-clause 9.7.3 as the following:***

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:(11ac)

* 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

***TGax editor: change 5th paragraph in the sub-clause 9.7.3 as the following:***

The Duration/ID fields in the MAC headers of all MPDUs in an A‑MPDU carry the same value. All ~~T~~the Duration/ID fields in the MAC headers of MPDUs in A-MPDUs carried in the same VHT MU PPDU, the same HE MU PPDU or ~~all~~ HE trigger-based PPDUs ~~addressed~~ transmitted simultaneously (#6484) to the same AP (#2429) ~~all~~ carry the same value.

The Duration/ID fields in the MAC headers of all MPDUs in an A-MPDU contained in an HE trigger-based PPDU shall be set to the value obtained from the Duration/ID field of the frame that elicited the HE trigger-based PPDU, minus one SIFS, minus the RXTIME of the HE trigger-based PPDU defined in Equation 21-105. (#9611)(11ac)

(#126)NOTE 1—The reference point for the Duration/ID field is the end of the PPDU carrying the MPDU. Setting the Duration/ID field to the same value in the case of A-MPDU aggregation means that each MPDU consistently specifies the same NAV setting.

***TGax editor: change 8th paragraph in the sub-clause 9.7.3 as the following:***

A VHT MU PPDU does do not carry more than one A-MPDU that contains one or more MPDUs soliciting an immediate response. A HE MU PPDU does not carry more than one A-MPDU that contains one or more MPDUs soliciting an immediate response that is not carried in an HE trigger-based PPDU (#2430).

NOTE 2—The TIDs present in a data enabled A-MPDU context are also constrained by the channel access rules (for a TXOP holder; see 10.22.2 (HCF (#2203)contention based channel access (EDCA)) and 10.22.3 (HCF controlled channel access (HCCA)(#3417))) and the RD response rules (for an RD responder, see 10.28.4 (Rules for RD responder)). This is not shown in these tables.

NOTE 3—If a STA supports A‑MSDUs of 7935 octets (indicated by the Maximum A‑MSDU Length field in the HT Capabilities element), A‑MSDUs transmitted by that STA within an A-MPDU carried in a PPDU with FORMAT HT\_MF or HT\_GF(11ac) are constrained so that the length of the QoS (#100)Data (Ed)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 or DMG PPDUs.(11ac) The use of A‑MSDU within A-MPDU might be further constrained as described in 9.4.1.14 (Block Ack Parameter Set field) through the operation of the A‑MSDU Supported field.