### IEEE P802.11Wireless LANs

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| 11ax D2.0 MAC Comment Resolution for HE Link Adaptation |
| Date: 2018-01-12 |
| Author(s): |
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Abstract

This submission proposes resolutions for comments of TGax Draft 2.0 with the following 19 CIDs:

**11457, 11544, 11743, 12436, 12550, 12551, 13172, 13173, 13174, 13175, 13759, 13813, 13860, 14144, 14145, 14146, 14147, 14148, 14149**

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Modifications based on feedback received during the ad hoc meeting
* Rev 2: Modifications based on feedback received during the interim meeting

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 D2.0 Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGax D2.0 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** | **Commenter** | **P.L** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 11457 | Carol Ansley | 35.29 | 3.4 | HLA for HE Link Adaptation needed in Acronyms | HLA isn't in the acronym list | Revised.Add HLA, HE link adaptation, to section Abbreviations and Acronyms.TGax editor adds the following abbreviation in subclause 3.4: “HLA HE link adaptation” |
| 11544 | Dorothy Stanley | 135.19 | 9.4.2.237.2 | what is the definition of "HE MFB"? | as in comment | Revised.Agree with the comment. Proposed resolution clarifies the definition as suggested.TGax editor to make the changes shown in 11-18/0081r1 under all headings that include CID 11544. |
| 11743 | GEORGE CHERIAN | 35.00 | 3.4 | Add HLA to the 3.4 Abbreviations and acronyms | As in the comment | Revised.See CID 11457. |
| 12436 | Liwen Chu | 190.61 | 10.9 | There is no normative behavior related to "dot11HEMCSFeedbackOptionImplemented". Remove it or add it in HE link adaptation subclause. | As in comment | Revised.Agree with the comment. Proposed resolution completes relevant behaviors in the HLA subclause and MIB attributes as suggested.TGax editor to make the changes shown in 11-18/0081r1 under all headings that include CID 12436. |
| 12550 | Liwen Chu | 309.56 | ~~27.11.6~~ 27.13 | the rules about how to select valid MCS, NSS are missing.Resolution could be referring to Supported TX HE-MCS, NSS set | Fix the issue mentioned in comment. | Revised.Agree with the comment to add rules about how to select recommended HE-MCS and NSS.TGax editor to make the changes shown in 11-18/0081r1 under all headings that include CID 12550. |
| 12551 | Liwen Chu | 310.38 | ~~27.11.6~~ 27.13 | This is not needed. | Remove the bullet | Revised. Agree with the comment to remove the bullet since it will not happen. When the response STA uses HLA control field, it is not possible the STA can use A-control field for any other protocols.TGax editor to make the changes shown in 11-18/0081r1 under all headings that include CID 12551. |
| 13172 | Qingjiang Tian | 65.06 | 9.2.4.6.4.4 | Better organization: "if Unsolicited MFB is 0 then: 1)..., 2) ....If Unsolicited MFB is 0 then the MRQ field is reserved. Good idea to apply to the other rows as well so that it has a bit of structure. Also please remove normative verbs from this subclause. Maybe use "recommended to" instead of "should". | As in comment. | Revised.Agree with the comment partially to replace “should” by other wording. However, the definition column is clear and follows the legacy structure of link adaptation.TGax editor to make the changes shown in 11-18/0081r1 under all headings that include CID 13172. |
| 13173 | Qingjiang Tian | 65.46 | 9.2.4.6.4.4 | Use same terminology as in other parts "RU Allocation. And also remove HE MCS from this row because it has nothing to do with MCS. Same observation applies to the BW row below (nothing to do with MCS). | As in comment. | Revised.Agree with the comment partially. Proposed resolution synchronizes the terminology as suggested. However, HE-MCS description is informative in the unsolicited MFB case. TGax editor to make the changes shown in 11-18/0081r1 under all headings that include CID 13173. |
| 13174 | Qingjiang Tian | 66.15 | 9.2.4.6.4.4 | "For an HE STA". Can it be sent by a non-HE STA? Seems not so please remove statement. | As in comment. | Revised.Agree with the comment. Proposed solution removes “For an HE STA” as suggested.TGax editor to make the changes shown in 11-18/0081r1 under all headings that include CID 13174. |
| 13175 | Qingjiang Tian | 66.15 | 9.2.4.6.4.4 | This row is confusing. Please organize it so that it has a better description. And please fix reference to the Figure XXX. | As in comment. | Revised.Agree with the comment partially. Proposed resolution fixes the typo as suggested. However, the row lists all possible contol combinations and is clear for implementation.TGax editor to make the changes shown in 11-18/0081r1 under all headings that include CID 13175. |
| 13759 | Xiaofei Wang | 66.35 | 9.2.4.6.4.4. | The Figure XXXX should not be left without a correct reference | add the correct reference | Revised.Agree with the comment. Proposed resolution fixes the typo as suggested.TGax editor to make the changes shown in 11-18/0081r1 under all headings that include CID 13759. |
| 13813 | Yasuhiko Inoue | 62.51 | 9.2.4.6.4.4 | Subclause 9.2.4.6.4.4 (HLA Control) needs to be improved. | As in the comment. | Rejected. The comment does not identify a technical issue.  |
| 13860 | Yongho Seok | 65.30 | 9.2.4.6.4.4 | "The HE-MCS subfield of the MFB subfield of HLA Control field should be set to the highest datarate, for given transmission properties, that results in frame error rate of 10% or lower for an MPDU length of 3895 octets."Clause 9 can't have "should" sentence. | Remove the cited sentence. Or, move it to 27.13. | Revised.Agree with the comment. Proposed resolution clarifies the issue as suggested.TGax editor to make the changes shown in 11-18/0081r1 under all headings that include CID 13860. |
| 14144 | yujin noh | 310.47 | 27.13 | "the MSI value that matches the MSI value" is ambiguous because two MSI values positioned in the differerent PPDU. To make it clear for exampe, the text could be modified as "the responder is providing feedback for the request that had the MSI value that matches the MSI value in the HLA Control field with the MRQ field equal to 1." | as in comment | Revised.Agree with the comment. Proposed resolution clarifies the ambiguity as suggested.TGax editor to make the changes shown in 11-18/0081r1 under all headings that include CID 14144. |
| 14145 | yujin noh | 310.57 | 27.13 | the subfield name is Packet Format defined in Figure 9-15f. "PPDU formats" => "Packet Format" | as in comment | Revised.Agree with the comment. Proposed resolution fixes the typo as suggested.TGax editor to make the changes shown in 11-18/0081r1 under all headings that include CID 14145. |
| 14146 | yujin noh | 310.57 | 27.13 | Tx BF subfield needs to be added in addition to "Packet Format, Coding Type, and Tx BF subfields" | as in comment | Revised.Agree with the comment. Proposed resolution lists all subfields as suggested.TGax editor to make the changes shown in 11-18/0081r1 under all headings that include CID 14146. |
| 14147 | yujin noh | 65.45 | 9.2.4.6.4.4 | make the meaning of the RU subfield simple like "Recommended RU" because all the detail is shown in Definition of colum of the same table. | as in comment | Rejected. RU has two different meanings, as recommended in unsolicited MFB or as requested in solicited MFB. Specifying the difference in the meaning column avoids ambiguity in the definition. |
| 14148 | yujin noh | 66.06 | 9.2.4.6.4.4 | make the meaning of the BW subfield simple like "Recommended BW" because all the detail is shown in Definition of colum of the same table. | as in comment | Rejected. BW has two different meanings, as recommended in unsolicited MFB or as requested in solicited MFB. Specifying the difference in the meaning column avoids ambiguity in the definition. |
| 14149 | yujin noh | 66.23 | 9.2.4.6.4.4 | PPDU type seems to have nothing to do with Coding Type information. The meaning of the MSI/PPDU type subfield does not represent its meaning well enough because it virtually shows MSI/Preamble Format/Coding Type. Change the name. | as in comment | Revised.Agree with the comment. Proposed resolution changes the namings of “PPDU Type” to “Partial PPDU Parameters” and “Packt format” to “PPDU format”.TGax editor to make the changes shown in 11-18/0081r1 under all headings that include CID 14149. |

**Discussion:**

None.

**Propose:**

***TGax editor: Modify “Table 9-262z—Subfields of the HE MAC Capabilities Information field” as the following:***

|  |  |  |
| --- | --- | --- |
| HE Link Adaptation Support(#7879) | Indicates support for link adaptation using the HLA Control field(#4727).(#6364) | If +HTC-HE Support is 1:Set to 0 (No Feedback) if the STA does not provide HE MFB.Set to 2 (Unsolicited) if the STA can receive and provide only unsolicited HE MFB.Set to 3 (Solicited and unsolicited) (#12436) if the STA is capable of receiving and providing(#7763) HE MFB in response to HE MRQ and if the STA can receive and provide unsolicited HE MFB.(#4786)The value 1 is reserved.HE MFB and HE MRQ are MFB and MRQ using HLA Control field, respectively. (#11544)Reserved if +HTC-HE Support is 0. |

***TGax editor: Modify “Table 9-18c HLA Control subfields” as the following:***

|  |  |  |
| --- | --- | --- |
| HE-MCS | Recommended HE-MCS | If the Unsolicited MFB subfield is 1 or if the Unsolicited MFB subfield is 0 and the MRQ subfield is 0, the HE-MCS subfield indicates the recommended HE-MCS, and is set to the HE-MCS Index value (defined in 28.5 (Parameters for HE-MCSs)).~~The HE-MCS subfield of the MFB subfield of HLA Control field should be set to the highest datarate, for given transmission properties, that results in frame error rate of 10% or lower for an MPDU length of 3895 octets.~~ (#13172, 13860)Otherwise, this subfield is reserved. |
| RU Allocation (#13173) | RU ~~index~~ of the recommended HE-MCS/RU ~~index~~ specified by MFB requester to get feedback | If the Unsolicited MFB subfield is 1, the RU Allocation subfield indicates the RU ~~index~~ for which the recommended HE-MCS is intended, as defined in 27.13:If the Unsolicited MFB subfield is 0 and the MRQ subfiled is 1, the RU Allocation subfield indicates the RU ~~index~~ requested by the MFB requester to get feedback.RU ~~index~~ Allocation subfield is interpreted with the BW subfield to specify the RU.RU index encoding is as defined 9.3.1.23.Otherwise, this subfield is reserved. |
| BW | Bandwidth of the recommendedHE-MCS/ Bandwidthspecified by MFBrequester to get feedback | If the Unsolicited MFB subfield is 1, the BW subfieldindicates the bandwidth for which the recommendedHE-MCS is intended, asdefined in 27.13.If the Unsolicited MFB subfield is 0 and the MRQsubfiled is 1, the BW subfield indicates the bandwidthrequested by the MFB requester to get feedback.~~For an HE STA:~~ (#13174 )Set to 0 for 20 MHzSet to 1 for 40 MHzSet to 2 for 80 MHzSet to 3 for 160 MHz or 80+80 MHz.Otherwise, this subfield is reserved. |
| MSI/Partial PPDU Parameters ~~Type~~(#14149) | Parial parameters ~~Packet~~ ~~Format~~ (#14149) of the measuredPPDU/ MRQ sequence identifier | If the Unsolicited MFB subfield is 0 and the MRQ subfield is 1, the MSI/~~PPDU-Type~~Partial PPDU Parameters(#14149) subfield contains a sequence number in the range 0 to 6 that identifies the specific MCS feedback request.If the Unsolicited MFB subfield is 0 and the MRQ subfield is 0, the MSI/~~PPDU-Type~~Partial PPDU Parameters(#14149) subfield contains a sequence number in the range 0 to 6 that reponds to the specific solicited MCS feedback request.If the Unsolicited MFB subfield is 1, the ~~PPDU-Type~~ MSI/Partial PPDU Parameters(#14149) subfield contains the ~~Packet~~ PPDU (#14149) Format and Coding Type subfields as shown in Figure ~~XXX~~9-15f(#13759, 13175).The ~~Packet~~ PPDU (#14149) Format subfield indicates the ~~packet~~ (#14149)format of the PPDU from which the unsolicited MFB was estimated:Set to 0 for HE\_SUSet to 1 for HE\_MUSet to 2 for HE\_EXT\_SUSet to 3 for HE\_TRIGThe Coding Type subfield contains the Coding information (0 for BCC and 1 for LDPC) of thePPDU from which the unsolicited MFB was estimated. |

***TGax editor: Modify “Figure9-15e” as the following:***

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2     B4 | B5     B8 | B9 | B10 B17 | B18 B19 | B20 B22 | B23 | B24 B25 |
|  | Unsolicited MFB | MRQ | NSS | HE-MCS | DCM | RUAllocation (#13173) | BW | MSI/~~PPDU Type~~ Partial PPDU Parameters(#14149) | Tx BF | Reserved |
| Bits: | 1 | 1 | 3 | 4 | 1 | 8 | 2 | 3 | 1 | 2 |
| * Control Information subfield format when Control ID subfield is 2
 |

***TGax editor: Modify “Figure9-15f” as the following:***

|  |  |  |
| --- | --- | --- |
|  | B0                B1 | B2 |
|  | ~~Packet~~ PPDU(#14149) Format | Coding Type |
| Bits: | 2 | 1 |
| * MSI/~~PPDU Type~~ Partial PPDU Parameters(#14149) subfield when the Unsolicited MFB subfield is 1
 |

***TGax editor: Modify “9.2.4.6.4.4” as the following:***

***Change the paragraph as follows:***

The format of the MSI/~~PPDU Type~~ Partial PPDU Parameters(#14149) subfield is defined in .

***TGax editor: Modify “27.13” as the following:***

***Add the paragraph as follows:***

This subclause applies to frame exchange sequences that include PPDUs containing an HE variant HT Control

field.

An HE STA shall set the value of HE Link Adaptation Support subfield in the HE Capabilities Information field in

the HE Capabilities element it transmits to dot11HEMCSFeedbackOptionImplemented.(#12436)

A STA that supports HE link adaptation using the HLA Control field shall set the HE Link Adaptation Support subfield in the HE Capabilities Information field in the HE Capabilities element to ~~Unsolicited or Both~~ value 2 or 3, depending on its own link adaptation feedback capability. A STA shall not send an MRQ to a STA that has not set the HE Link Adaptation Support subfield to value ~~Both~~ 3 in the HE Capabilities Information field of the HE Capabilities element. A STA shall not send an unsolicited MFB in any frame that contains an HLA Control field to a STA that has not set the HE Link Adaptation Support subfield to value either ~~Unsolicited or Both~~ 2 or 3 in the HE Capabilities Information field of the HE Capabilities element.

***Change the paragraph as follows:***

The MFB responder may send a solicited response frame with any of the following combinations of HE-MCS, NSS, and MSI:

* ~~HE-MCS = 15, NSS = 7, MSI = 7: no information is provided for the immediately preceding MRQ request. This combination is used when the responder is required to use HE variant HT Control field for other protocols and when no MFB is available. It has no effect on the status of any other pending MRQ.~~(#12551)
* HE-MCS = 15, NSS = 7, MSI = 0~6: the responder ~~is not now providing, and will never~~ will not provide, feedback for the request that had the MSI value ~~that matches the MSI value~~(#14144).
* HE-MCS = valid value, NSS = valid value, MSI = 0~6: the responder is providing feedback for the request that had the MSI value ~~that matches the MSI value~~. The MSI value in the response frame matches the MSI ~~vaule~~ value of the MRQ request. (#14144)

***Add and change the paragraphs as follows:***

In an unsolicited MFB response the PPDU format~~s~~(#14145), ~~and~~ Coding Type, and Tx BF(#14146) subfields are set according to the RXVECTOR parameters of the received PPDU from which the HE-MCS, RU, BW, and NSS are estimated, as follows:

* The PPDU format subfield is set and encoded as follows:
* 0 if the parameter FORMAT is equal to HE\_SU
* 1 if the parameter FORMAT is equal to HE\_MU
* 2 if the parameter FORMAT is equal to HE\_EXT\_SU
* 3 if the parameter FORMAT is equal to HE\_TRIG
* The Coding Type subfield is set to 0 if the parameter FEC\_CODING is equal to BCC\_CODING and set to 1 if equal to LDPC\_CODING.
* The Tx BF subfield is set to 1 if the parameter BEAMFORMED is equal to 1 and set to 0 if equal to 0.
* The BW subfield shall indicate a bandwidth less than or equal to the bandwidth indicated by the parameter CH\_BANDWIDTH.
* The RU subfield shall cooperate with the BW subfiled to indicate the RU at which the recommended HE-MCS locates. The recommeded RU shall be within an RU in which the measured HE PPDU is located.

For either solicited or unsolicited response, the recommended HE-MCS and NSS subfields of HLA Control field shall be selected from the <HE-MCS, NSS> set supported by the recipient STA. (#12550)

The HE-MCS subfield of HLA Control field is the recommended ~~to be the highest~~ datarate, for given transmission properties carried in the RXVECTOR of the PPDU used for MFB estimation, which results in an estimated frame error rate of 10% or lower for an MPDU length of 3895 octets. (#13172, 13860, 12550)

NOTE—Some HE PPDU might not be able to carry 3895 octets due to PPDU duration limitations.

***TGax editor: Modify” C.3 MIB Detail” as the following:***

***Change the paragraph as follows:***

Dot11HEStationConfigEntry ::=

 SEQUENCE {

 dot11HEULMUResponseSchedulingOptionImplemented TruthValue,

 dot11ULMUMIMOOptionImplemented TruthValue,

 dot11OFDMARandomAccessOptionImlemented TruthValue,

 dot11HEControlFieldOptionImplemented TruthValue,

 dot11OMIOptionImplemented TruthValue,

 dot11HEMCSFeedbackOptionImplemented ~~TruthValue~~INTEGER(#12436),

 dot11HEDynamicFragmentationLevel INTEGER,

 dot11AMPDUwithMultipleTIDOptionImplemented TruthValue,

 dot11MPDUAskedforAckInMultiTIDAMPDU TruthValue,

 dot11TXOPDurationRTSThreshold Unsigned32,

 dot11PPEThresholdsRequired TruthValue,

 dot11IntraPPDUPowerSaveOptionActivated TruthValue,

 dot11AMSDUFragmentationOptionImplemented TruthValue,

 dot11BSSColorCollisionAPPeriod Unsigned32,

 dot11BSSColorCollisionSTAPeriod Unsigned32,

 dot11AutonomousBSSColorCollisionReportingImplemented TruthValue(#3088),

 dot11HESRPOptionImplemented TruthValue(#Ed),

 dot11HEBSRControlImplemented TruthValue,

 dot11HEUPHControlActivated TruthValue,

 dot11HEBQRControlImplemented TruthValue,

 dot11HECASControlImplemented TruthValue(#4750),

 dot11PartialBSSColorImplemented TruthValue(17/389r10)

 }

***Change the paragraph as follows:***

dot11HEMCSFeedbackOptionImplemented OBJECT-TYPE

 ~~SYNTAX TruthValue~~ SYNTAX INTEGER {none(0), unsolicited(2), solicited and unsolicited(3)}(#12436)

 MAX-ACCESS read-only

 STATUS current

 DESCRIPTION

 "This is a capability variable.

 Its value is determined by device capabilities.

 This attribute indicates the HE(#12436) MCS feed back capability supported by the station implementation."

 DEFVAL { ~~false~~ 0(#12436) }

 ::= { dot11HEStationConfigEntry 6}