IEEE P802.11  
Wireless LANs

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| **Proposed resolution for comments related to**  **CIDs in 10.9** |
| **Date:** 2017/05/9 |

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Abstract

This submission proposes resolutions for comments in clause 10.9 of TGax Draft 1.0 with the following CIDs:

* CIDs: 4750, 5947, 5960, 7253, 7666, 7763 (clause 9.4.2.218.2), 7885

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: updated MIB variable names for CID#4750 resolution per suggestion by Alfred.

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** | **Clause Number** | **Page** | **Line** | **Comment** | **Proposed Change** | **Resolution** |
| 4750 | 10.9 | 126 | 63 | There are 7 control fields defined and only 3 MIB variables here. There has to be one MIB for each of the 7. Add the remaining 4 MIB variables to the list. | As in comment. | Revised  Agree in principle, since in Annex C only  dot11HEULMUResponseSchedulingOptionImplemented, dot11HEMCSFeedbackOptionImplemented, and dot11OMIOptionImplemented are defined. Define 4 additional MIB variables as described below. |
| 5947 | 10.9 | 127 | 47 | The spec says "At most one Control subfield with a given Control ID value shall be present in the A-Control field of QoS Data or Management frames carried in an (A-)MPDU". It is not clear what to do if more than one A-Control field of a given Cotnrol ID subfield is received in QoS Data or Management frames in an (A-)MPDU. | Please clarify. | Revised.  Add a sentence “Any additional Control subfield with a given Control ID shall be ignored.” |
| 5960 | 10.9 | 127 | 37 | The guidance for the reverse direction protocol A-Control field use is missing from the clause. | Please add the following sentence to line 37: "A value of 6 in the Control ID subfield when the transmitting STA follows the reverse direction protocol procedure as described in 10.28 (Reverse Direction Protocol)." | Accept. |
| 7253 | 10.9 | 127 | 47 | HE A-Control field can be present in the QoS Null frame. | Modify the text as below:  At most one Control subfield with a given Control ID value shall be present in the A-Control field of QoS Data frame, QoS Null frame, or Management frames carried in an (A-)MPDU | Accept. |
| 7666 | 10.9 | 126 | 43 | The paragraph started with "If the HT variant HT Control field is present in an MPDU, the DEI subfield provides information on the drop eligibility of the..." is missing. Add it back. | As in comment | Revised.  Agree in principle that it is clearer to the editor to include this ‘missing’ paragraph, although it was probably excluded because it remains unchanged as the last paragraph of the clause.  An earlier paragraph starting with “If the HT Control field is present” is from the baseline and should not be labeled as changed text. |
| 7763 | 9.4.2.218.2 | 78 | 31 | Can refers to normative permission, not appropriate here | Change "can" to "is capable of" | Revised.  Change “can provide’ to ‘is capable of providing”. |
| 7885 | 10.9 | 127 | 52 | An HE STA that receives an A-Control field shall ignore the remainder of the A-Control field that follows a Control ID subfield whose value is not recognized or is not supported by the STA." -- this is a interop/forward-compatibility disaster waiting to happen | Change to "An HE STA that receives an A-Control field shall ignore a Control field with a Control ID subfield whose value is not recognized or is not supported by the STA." | Accept. |

**Discussion**

Abstract

This document provides resolutions for the following CIDs on Clause 25.9.3. The baseline for this comment resolution document is 802.11ax Draft 0.1.

* CIDs: 705, 706

Mostly agree with the commenters’ opinion.

**Proposed resolution**

***Detailed implementation of the resolution***

Make the following changes to 802.11ax D 1.0

***TGax editor: Change the paragraph below of section 9.4.2.218.2 HE MAC Capabilities Information field on page 78 line 31 as the following (#CID*** *7763* ***):***

* HE MAC Capabilities Information field

|  |  |  |  |
| --- | --- | --- | --- |
| * Subfields of the HE MAC Capabilities Information field | | | |
| HE Link Adaptation Capable | | Indicates whether the STA supports link adaptation using the HE variant HT Control field. | 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 provides only unsolicited HE MFB.  Set to 3 (Both) if the STA ~~can~~ is capable of provid~~e~~ing (#7763)HE MFB in response to HE MRQ and if the STA provides unsolicited HE MFB.  The value 1 is reserved.  Reserved if +HTC-HE Support is 0. |

***TGax editor: Change the paragraph below of section 10.9 HT Control field operation on page 126 line 43 ~ page 127 line 54 as the following (#CID*** *4750, 5947, 5960, 7253, 7666, 7885* ***):***

* HT Control field operation

Change 10.9 as follows:

If the value of dot11HTControlFieldSupported is true, a STA shall set the +HTC Support subfield of the HT Extended Capabilities field of the HT Capabilities element to 1 in HT Capabilities elements that it transmits. If the value of dot11VHTControlFieldOptionImplemented is true, a STA shall set the +HTC-VHT Support subfield of the VHT Capabilities Information field of the VHT Capabilities element to 1 in VHT Capabilities elements that it transmits. If dot11HEControlFieldOptionImplemented is true, a STA shall set the +HTC-HE Support subfield of the HE Capabilities Information field of the HE Capabilities element to 1 in HE Capabilities elements that it transmits.

A STA that has a value of true for at least one of dot11RDResponderOptionImplemented, dot11MCSFeedbackOptionImplemented, and dot11AlternateEDCAActivated shall set dot11HTControlFieldSupported or dot11VHTControlFieldOptionImplemented or both to true. A STA for which at least one of dot11HEULMUResponseSchedulingOptionImplemented, dot11HEMCSFeedbackOptionImplemented, ~~or~~ dot11OMIOptionImplemented, dot11HEBSRControlImplemented, dot11HEUPHControlActivated, dot11HEBQRControlImplemented, or dot11HECASControlImplemented (#4750) is true shall set dot11HEControlFieldOptionImplemented to true.

An HT variant HT Control field shall not be present in a frame addressed to a STA unless that STA declares support for +HTC-HT in the HT Extended Capabilities field of its HT Capabilities element (see 9.2.4.6 (HT Control field)).

A VHT variant HT Control field shall not be present in a frame addressed to a STA unless that STA declares support for +HTC-VHT in the VHT Capabilities Information field of its VHT Capabilities element.

NOTEAn HT STA that does not support +HTC (HT or VHT variant) that receives a +HTC frame addressed to another STA still performs the CRC on the actual length of the MPDU and uses the Duration/ID field to update the NAV, as described in <reference>.

An HE variant HT Control field shall not be present in a frame addressed to a STA unless that STA declares support for +HTC-HE in the HE Capabilities Information field of its HE Capabilities element. The HE variant HT Control field carried in the frame may contain a Control subfield supported by the intended receiver that has:

* A value of 0 in the Control ID subfield when the transmitting STA expects an HE trigger-based PPDU that carries an immediate acknowledgement, as described in 27.5.2 (UL MU operation).
* A value of 1 in the Control ID subfield when the transmitting STA changes the receive operating mode, as described in 27.8 (Operating mode indication).
* A value of 2 in the Control ID subfield when the transmitting STA follows the HE link adaptation procedure, as described in 10.31.4 (Link adaptation using the HE variant HT Control field).
* A value of 3 in the Control ID subfield when the transmitting STA follows the corresponding buffer status report procedure, as described in 27.5.2.5 (HE buffer status feedback operation for UL MU)
* A value of 4 in the Control ID subfield when the transmitting STA follows the UL MU operation procedure, as described in 28.3.14.2 (Power pre-correction).
* A value of 5 in the Control ID subfield when the transmitting STA follows the bandwidth query report procedure, as described in 27.5.1.3 (HE bandwidth query report operation for DL MU).
* A value of 6 in the Control ID subfield when the transmitting STA follows the reverse direction protocol procedure as described in 10.28 (Reverse Direction Protocol). (#5960)

If the HT Control field is present in an MPDU aggregated in an A-MPDU, then all MPDUs of the same frame type (i.e., having the same value for the Type subfield of the Frame Control field) aggregated in the same A-MPDU shall contain an HT Control field. The HT Control field of all MPDUs containing the HT Control field aggregated in the same A-MPDU shall be set to the same value. (#7666)

If an A-Control field is present in a frame then it shall contain at least one Control subfield, and the Control subfield shall be present in the A-Control field only if it is supported by the receiving STA; otherwise it shall not be present. At most one Control subfield with a given Control ID value shall be present in the A-Control field of QoS Data, QoS NULL, (#7253) or Management frames carried in an (A-)MPDU. Any additional Control subfield with a given Control ID shall be ignored. (#5947)

NOTE—An A-Control field that is present in a frame cannot contain only the Padding subfield.

~~An HE STA that receives an A-Control field shall ignore the remainder of the A-Control field that follows a Control ID subfield whose value is not recognized or is not supported by the STA.~~ An HE STA that receives an A-Control field shall ignore a Control field with a Control ID subfield whose value is not recognized or is not supported by the STA. (#7885)

If the HT variant HT Control field is present in an MPDU, the DEI subfield provides information on the drop eligibility of the contents of the received MPDU. When there are insufficient resources in a STA, the STA arbitrarily discards frames in order to recover from the lack of resources. With the information from the DEI subfield, a STA may selectively drop frames with the DEI subfield set to 1 in preference to frames with the DEI subfield set to 0, if resources are insufficient. Note that this might not help in the recovery in all conditions, and the STA might still have to fall back to the arbitrary discard strategy. The mechanisms for determining whether resources are insufficient or when to discard MSDUs or A-MSDUs are beyond the scope of this standard. (#7666)

ASN.1 encoding of the MAC and PHY MIB

dot11HEStationConfigEntry OBJECT-TYPE

SYNTAX Dot11HEStationConfigEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry (conceptual row) in the dot11HEStationConfig Table.

ifIndex - Each IEEE 802.11 interface is represented by an ifEntry. Interface tables in this MIB module are indexed by ifIndex."

INDEX { ifIndex }

::= { dot11HEStationConfigTable 1 }

Dot11HEStationConfigEntry ::=

SEQUENCE {

dot11HEULMUResponseSchedulingOptionImplemented TruthValue,

dot11ULMUMIMOOptionImplemented TruthValue,

dot11OFDMARandomAccessOptionImlemented TruthValue,

dot11HEControlFieldOptionImplemented TruthValue,

dot11OMIOptionImplemented TruthValue,

dot11HEMCSFeedbackOptionImplemented TruthValue,

dot11HEDynamicFragmentationImplemented TruthValue,

dot11AMPDUwithMultipleTIDOptionImplemented TruthValue,

dot11MPDUAskedforAckInMultiTIDAMPDU TruthValue,

dot11DurationRTSThreshold Unsigned32,

dot11PPEThresholdsRequired TruthValue,

dot11IntraPPDUPowerSaveOptionActivated TruthValue,

dot11AMSDUFragmentationOptionImplemented TruthValue,

dot11HEBSRControlImplemented TruthValue,

dot11HEUPHControlActivated TruthValue,

dot11HEBQRControlImplemented TruthValue,

dot11HECASControlImplemented (#4750) TruthValue

}

dot11HEULMUResponseSchedulingOptionImplemented OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by device capabilities.

This attribute, when true, indicates that the station implementation is capable of receiving frames with an UL MU response scheduling A-Control field. The capability is disabled, otherwise."

DEFVAL { false }

::= { dot11HEStationConfigEntry 1}

dot11ULMUMIMOOptionImplemented OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by device capabilities.

This attribute, when true, indicates that the station implementation is capable of a full bandwidth UL MU-MIMO transmission. The capability is disabled, otherwise."

DEFVAL { false }

::= { dot11HEStationConfigEntry 2}

dot11OFDMARandomAccessOptionImlemented OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by device capabilities.

This attribute, when true, indicates that the station implementation is capable of an OFDMA random access operation. The capability is disabled, otherwise."

DEFVAL { false }

::= { dot11HEStationConfigEntry 3}

dot11HEControlFieldOptionImplemented OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by device capabilities.

This attribute, when true, indicates that the station implementation is capable of receiving the HE variant HT Control field. The capability is disabled, otherwise."

DEFVAL { false }

::= { dot11HEStationConfigEntry 4}

dot11OMIOptionImplemented OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by device capabilities.

This attribute, when true, indicates that the station implementation is capable of receiving frames with an OM Control subfield. The capability is disabled, otherwise."(#7890)(#4783)

DEFVAL { false }

::= { dot11HEStationConfigEntry 5}

dot11HEMCSFeedbackOptionImplemented OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by device capabilities.

This attribute indicates the MCS feed back capability supported by the station implementation."

DEFVAL { false }

::= { dot11HEStationConfigEntry 6}

dot11HEDynamicFragmentationImplemented OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by device capabilities.

This attribute, when true, indicates that the STA implementation is

capable of receiving dynamic fragments. The capability is disabled,

otherwise"

DEFVAL { false }

::= { dot11HEStationConfigEntry 7}

dot11AMPDUwithMultipleTIDOptionImplemented OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by device capabilities.

This attribute, when true, indicates that the station implementation is capable of generating an A-MPDU that contains QoS Data frames with two or more different TID values. The capability is disabled, otherwise."

DEFVAL { false }

::= { dot11HEStationConfigEntry 8}

dot11MPDUAskedforAckInMultiTIDAMPDU OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by device capabilities.

This attribute, when true, indicates that the station implementation is capable of receiving a multi-TID A-MPDU that can solicit either Ack or BlockAck, or both. The capability is disabled, otherwise."

DEFVAL { false }

::= { dot11HEStationConfigEntry 9}

dot11DurationRTSThreshold OBJECT-TYPE

SYNTAX Unsigned32 (0..1023)

UNITS "32 microseconds"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This is a control variable.

It is written by an external management entity or by the MAC upon receiving duration-based RTS threshold notification frame.

Changes take effect as soon as practical in the implementation.

This attribute indicates the duration of the transmission or TXOP above which an RTS/CTS handshake is performed. Value zero means the RTS should be always used for TxOP transmission. Value 1023 means this feature is disabled"

DEFVAL { 1023 }

::= { dot11HEStationConfigEntry 10}

dot11PPEThresholdsRequired OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by device capabilities.

This attribute, when true, indicates that Post-FEC Padding and Packet Extension Thresholds exist and are provided in dot11PPEThresholdsTable(#1313)."

DEFVAL { false }

::= { dot11HEStationConfigEntry 11}

dot11IntraPPDUPowerSaveOptionActivated OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by device capabilities.

This attribute, when true, indicates that the station implementation is capable of Intra PPDU Power Save operation. The capability is disabled, otherwise."

DEFVAL { false }

::= { dot11HEStationConfigEntry 12}

dot11AMSDUFragmentationOptionImplemented OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable. Its value is determined by device

capabilities.

This attribute, when true, indicates that the STA implementation is

capable of receiving dynamic fragments of A-MSDUs. The capability is

disabled, otherwise"

DEFVAL { false }

::= { dot11HEStationConfigEntry 13}

dot11HEBSRControlImplemented OBJECT-TYPE (#4750)

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by device capabilities.

This attribute, when true, indicates that the station implementation is capable of receiving frames with a BSR Control subfield. The capability is disabled, otherwise."

DEFVAL { false }

::= { dot11HEStationConfigEntry 14}

dot11HEUPHControlActivated OBJECT-TYPE (#4750)

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a control variable.

Its value is determined by device capabilities.

This attribute, when true, indicates that the station implementation is capable of receiving frames with an UPH Control subfield. The capability is disabled, otherwise."

DEFVAL { false }

::= { dot11HEStationConfigEntry 15}

dot11HEBQRControlImplemented OBJECT-TYPE (#4750)

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by device capabilities.

This attribute, when true, indicates that the station implementation is capable of receiving frames with a BQR Control subfield. The capability is disabled, otherwise."

DEFVAL { false }

::= { dot11HEStationConfigEntry 16}

dot11HECASControlImplemented OBJECT-TYPE (#4750)

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable.

Its value is determined by device capabilities.

This attribute, when true, indicates that the station implementation is capable of receiving frames with a CAS Control subfield. The capability is disabled, otherwise."

DEFVAL { false }

::= { dot11HEStationConfigEntry 17}