IEEE P802.11
Wireless LANs

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| CR MU EDCA Timer |
| Date: 2019-05-10 |
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Abstract

This submission proposes resolutions for the following comments received for TGax LB238:

20175

Changes are referenced to TGax D4.3.

**REVISION NOTES:**

**R0**:

Initial

**R2**:

Fixed document property problems

Author list additions

Modified grammar in various places with no technical change

Change Selected AID Bitmap to Affected AID Bitmap

**R3**:

Fixed a spelling error

Swapped the order of two paragraphs in the element description and then merged them to a single paragraph

Clarified language on EDCA behaviour following the MUEDCATimer reset operation.

**R4**:

Fixed a few grammatical errors

9.6.32.2a - Reworded a few phrases for readability

**R5**:

9.6.32.2a – Change name of AAB Elements field to AAB List field in order to avoid confusion with the AAB Element

**R6**:

A few wording changes for readability and clarity

Fixed bit count problem in Starting AID field format diagram

9.6.32.2a – affected ACs bitmap lacked an explicit indication of which value 0 or 1 has which meaning, i.e. reset the timer

**R7：**

Updated author list.

**R8:**

A new option to terminate the MU EDCA Timer.

**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.***

**CIDs**

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| 20175 | Chunyu Hu | 26.2.7 | 307.37 | The MU EDCA procedure is lack of an explicit or implicit signaling mechanism that allows AP or non-AP STAs to exit current MU EDCA backoff period when AP stops triggering. The lack of the mechanism can cause non-AP STAs' UL traffic being delayed significantly. | Define an explicit or implicit signaling mechanism to solve this problem. | Revise - TGax editor to make changes as shown in 11-19/0765r8 that are marked with CID 20175 which generally agree with the commenter’s suggestion. |

**Discussion:**

xxxx

**Proposed Changes to TGax D4.3:**

***TGax Editor: change section 9.2.4.6a.2 as follows:***

9.2.4.6a.2 OM Control

……

~~If the OM Control field is transmitted by an HE AP, then the UL MU Disable and UL MU Data Disable sub­fields are reserved.~~

If the OM Control field is transmitted by an HE AP, the UL MU Data Disable sub­fields is reserved. A value of 1 in the UL MU Disable field indicates that the non-AP STA that received the OM Control field may reset the MU EDCATimer to 0, otherwise, the value of the bit is 0.

**……**

***TGax Editor: Modify subclause 26.2.7 EDCA operation using MU EDCA parameters as shown:***

**26.2.7 EDCA operation using MU EDCA parameters**

A non-AP STA that receives an MU EDCA Parameter Set element from the AP to which it is associated follows the procedure defined in this subclause.

An HE AP may announce MU EDCA parameters for non-AP HE STAs by including the MU EDCA Parameter Set element in selected Beacon frames and in all Probe Response and (Re)Association Response frames it transmits. If an HE AP announces both EDCA parameters and MU EDCA Parameters, the MU EDCA Parameter Set element shall be included in all Beacon frames that contain an EDCA Parameter Set element. An HE AP shall set the QoS Info field of an MU EDCA Parameter Set element (if present) to the same value as the QoS Info field of an EDCA Parameter Set element (if present). An HE AP may change the MU EDCA parameters by including the MU EDCA Parameter Set element with updated MU EDCA parameters in the Beacon frames and Probe Response frames it transmits. The EDCA Parameter Set Update Count subfield in the QoS Info field of the EDCA Parameter Set element is incremented every time any of the AC parameters or the MU AC parameters change.

An HE STA shall update its MIB attributes that correspond to fields in an MU EDCA Parameter Set element within an interval of time equal to one beacon interval after receiving an updated EDCA parameter set. When updating its MIB attributes, an HE STA stores the value of the EDCA Parameter Set Update Count subfield in the QoS Info field of the received EDCA Parameter Set element.

An HE STA shall check the EDCA Parameter Set Update Count subfield value in the QoS Info field of the QoS Capability element in the most recently received Beacon frame against the stored value to determine if the HE STA is using the current EDCA and MU EDCA parameters. If the EDCA Parameter Set Update Count subfield value is different from the stored value, then the HE STA shall send a Probe Request frame to the AP to solicit an update.

NOTE—The QoS Capability element is only present in a Beacon frame if the EDCA Parameter Set element and the MU EDCA Parameter Set element are not present. In this case, the only way for an HE STA to obtain the updated parameters is to send a Probe Request frame to the AP.

A non-AP HE STA that receives a Basic Trigger frame that contains a User Info field addressed to the STA, and that receives an immediate response from the AP for the transmitted HE TB PPDU, shall update its CWmin[AC], CWmax[AC], AIFSN[AC] and MUEDCATimer[AC] state variables to the values contained in the most recently received MU EDCA Parameter Set element sent by the AP to which the STA is associated, for all the ACs from which QoS Data frames were transmitted successfully in the HE TB PPDU. The MUEDCATimer[AC] state variable is updated with the value contained in the MU EDCA Timer subfield of the MU EDCA Parameter Set element. The backoff counter maintenance corresponding to the updated state variables shall follow the rules in 10.22.2.2 (EDCA backoff procedure), and the updated MUEDCATimer[ AC] shall start at the end of the immediate response.

In a non-AP HE STA, each MUEDCATimer[AC] shall uniformly count down without suspension to 0 when its value is nonzero.

NOTE 1—A non-AP STA that sends a frame to the AP with an OM Control subfield containing a value of 1 in the UL MU Disable subfield or a value of 0 in the UL MU Disable subfield and a value of 1 in the UL MU Data Disable subfield does not participate in UL MU operation. As such it is exempt from updating its EDCA access parameters to the values contained in the MU EDCA Parameter Set element as defined in this subclause.

NOTE 2—A non-AP STA that sends a QoS Data frame with Ack policy set to No Ack updates its state variables to the values contained in the MU EDCA Parameter Set element irrespective of receiving immediate response from the AP. The updated MUEDCATimer starts at the end of the HE TB PPDU.

NOTE 3—A non-AP STA is not required to update its state variables to the values contained in the MU EDCA Parameter Set element when:

— The Trigger frame addressed to the STA is not a Basic Trigger frame

— The STA does not include QoS Data frames in the HE TB PPDU response sent in response to the Basic Trigger frame

— The STA transmits the HE TB PPDU in response to a Basic Trigger frame following the rules defined in 26.5.5 (UL OFDMA-based random access (UORA)).

NOTE 4—The TxOPLimit[AC] state variables are not updated by the procedure defined in this subclause, but in 10.22.2.8 (TXOP limits).

Frames sent by a non-AP STA that are addressed to a STA that is not its associated AP may use the EDCA parameters values that are contained in the most recently received EDCA Parameter Set element sent by the AP with which the STA is associated, or to the default EDCA parameter values (see Table 9-137 (Default EDCA Parameter Set element parameter values if dot11OCBActivated is false)) if an EDCA Parameter Set element has not been received.

When the MUEDCATimer[AC] of a non-AP HE STA reaches zero, either by counting down or due to a reset following the reception of an OM Control field, then the STA may update CWmin[AC], CWmax[AC] and AIFSN[AC] either to the values that are contained in the most recently received EDCA Parameter Set element sent by the AP with which the STA is associated, or to the default EDCA parameter values (see Table 9-137 (Default EDCA Parameter Set element parameter values if dot11OCBActivated is false)) if an EDCA Parameter Set element has not been received.

A non-AP HE STA that sends a frame with an OM Control subfield with the UL MU Disable subfield set to 1 or with the UL MU Disable subfield set to 0 and the UL MU Data Disable subfield set to 1 as defined in 26.9.3 (Transmit operating mode (TOM) indication) may set the MUEDCATimer[AC] for all ACs to 0 on receiving an immediate acknowledgment from the OMI responder. The STA continues the current EDCA backoff procedure without modifying the QSRC[AC], QLRC[AC] or the backoff counter for the associated EDCAF, regardless of whether the MUEDCATimer[AC] has reached zero, until the STA invokes a new EDCA backoff procedure. The STA follows the rules defined in 10.22.2.2 (EDCA backoff procedure) for updating CW[AC].

A non-AP HE STA that receives a QoS frame with UL MU Disable subfield set to 1 in the OM Control field from its associated AP may reset the MUEDCATimer[AC] to 0 for the AC corresponding to the TID of the QoS Control field of the frame. The STA may invoke a new EDCA backoff procedure after the MUEDCATimer[AC] is reset for that AC and after CWmin[AC], CWmax[AC] and AIFSN[AC] are updated for that AC, as per this subclause, in response to the MUEDCATimer[AC] reset.

**End of proposed changes.**