IEEE P802.11
Wireless LANs

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| CR for MU EDCA parameters |
| Date: 2018-07-09 |
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Abstract

This document provides CR for CIDs: 15059 15755 15756 16653 16939 16940.

1. **Introduction**

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. The introduction and the explanation of the proposed changes are 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(C)** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 15059 | 11.2.3.17 | 241.27 | Modification of MU-EDCA parameter should be one of the triggers for incrementing Check Beacon | Add a bullet to cover modification of MU-EDCA parameters element | Revised – agree with the commenter. Apply the changes as proposed in doc 1496r0. |
| 15755 | 27.2.6 | 261.34 | A STA should be allowed to use EDCA parameters, if it has set UL MU Data Disable to 1. | Please add that A STA is allowed to use EDCA parameters, if it has set UL MU Disable to 0 and UL MU Data Disable to 1. | Revised – agree with the commenter. Apply the changes as proposed in doc 1496r0. |
| 15756 | 27.2.6 | 261.54 | What is the meaning of the sentence? Why transmissions form ACs that has buffered frames to other than the associated AP should not be done? If the problem is the frame transmission to other STA than associated AP, then only this operation should be limited, not the use of the whole AC. | Please clarify. | Revised – this sentence is to recommend not using triggered access with one AC if that AC is also used for TDLS. Rephrase the sentence and apply the changes as proposed in doc 1496r0. |
| 16653 | 27.2.6 | 261.61 | "default dot11EDCATable" is not clear. The MIB object dot11EDCATable contains the most recently parameters received from the AP and, if none have been received, the defaults. So just referrencing dot11EDCATable is sufficient. | Refer to dot11EDCATable since it contains what is needed here. | Revised – agree in principle with the comment. We can not really reference dot11EDCA Table as we are modifying this with MU EDCA parameters. Reference Table 9-137. Apply the changes as proposed in doc 1496r0. |
| 16939 | 27.2.6 | 261.06 | Is the phrase "of all Beacon frames" together with the mandatory "shall" in the same sentence implying that HE STAs must listen to all beacons, and hence not allowed to use power saving algorithms in which a few beacons may be skipped? If not so, the word "all" should be removed or changed. | remove the word "all". | Revised – Agree with the comment. Apply the changes as proposed in doc 1496r0. |
| 16940 | 27.2.6 | 261.08 | the required action "the HE STA shall send a Probe Request frame to the AP to query for any update." is too restrictive and calls for sometimes unnecessary transmissions. An alternative action could be for the STAs to wait for additional beacons to get the current MU EDCA values, for example, if the STA doesn't have any pending packets to transmit, or if the STA doesn't participate in UL MU operations. | add more options for the non-AP STA to retrieve the most up to date MU EDCA parameters, or alternatively, have the AP transmit the information more frequently. | Revised – agree with the commenter. Clarify that sending the probe is only for STAs that have non-empty queues. Apply the changes as proposed in doc 1496r0. |

1. **Proposed changes**

***11ax Editor: Modify clause 11.2.3.17 TIM Broadcast as below***

Change the 11th paragraph as follows:

The AP shall increase the value (modulo 256) of the Check Beacon field in the next transmitted TIM frame(s) when a critical update occurs to any of the elements inside the Beacon frame. The following events shall classify as a critical update:

* Inclusion of a Channel Switch Announcement element
* Inclusion of an Extended Channel Switch Announcement element
* Modification of the EDCA parameters element
* Inclusion of a Quiet element
* Modification of the DSSS Parameter Set
* Modification of the CF Parameter Set element
* Modification of the HT Operation element
* Inclusion of a Wide Bandwidth Channel Switch element
* Inclusion of a Channel Switch Wrapper element
* Inclusion of an Operating Mode Notification element
* Inclusion of a Quiet Channel element
* Modification of the VHT Operation element
* Modification of the HE Operation element
* Insertion of a Broadcast TWT element
* Inclusion of the BSS Color Change Announcement element
* Modification of the MU EDCA Parameter Set element
* Modification of the Spatial Reuse Parameter Set element

NOTE—Modification of an element means that at least one value of a field in the element is changed. Inclusion of an element means that the element is included in(#11473) a Beacon frame. The Insertion of an element means that the element was not present in the previous Beacon frame and is present in the current Beacon frame.

(#15059)

***11ax Editor: Modify clause 27.2.6 EDCA operation using MU EDCA parameters as below***

* EDCA operation using MU EDCA parameters

An HE AP may announce MU EDCA parameters for non-AP HE STAs, by including the MU EDCA Parameter Set element in selected Beacon frame, 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 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. HE STAs update the MIB attributes and store the EDCA Parameter Set update count value of the received QoS Info field.

An HE STA shall use the EDCA Parameter Set Update Count Value subfield in the QoS Capability element of Beacon frames to determine whether the STA is using both the current EDCA Parameter Values and the current MU EDCA Parameter Values. If the EDCA Parameter Set update count value in the QoS Capability element is different from the value that has been stored, the HE STA shall send a Probe Request frame to the AP to query for any update if the STA has non-empty buffer queues. (#16940)(#12041)

NOTE—The QoS Capability element is present in beacons only 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 query the updated parameters is to send a Probe Request frame to the AP.(#12041)

A non-AP STA that has received an MU EDCA Parameter Set element from the AP to which it is associated follows the procedure defined in this subclause.(#11798)

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](#11989) 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](#11989) 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](#11989) shall start at the end of the immediate response.

In a non-AP HE STA, each MUEDCATimer[AC](#11989) 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(#14137) containing a value of 1 in the UL MU Disable subfield or 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(#11989) 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 27.5.5 (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).

A non-AP HE STA that transmits QoS Data frames in an HE TB PPDU should not send QoS Data frames from ACs for which the STA's buffer queues contain both frames that are addressed to its associated AP and frames that are addressed to a TDLS peer STA, if the MU EDCA parameters for these ACs are less aggressive. (#15756)(#13075, #13887)

When the MUEDCATimer[AC](#11989) of a non-AP HE STA reaches zero, 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(#12210) 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. (#16653)

A non-AP HE STA that sends a frame with an OM Control subfield(#14137) with the UL MU Disable subfield set to 1 or with the UL MU Data Disable subfield set to 1 as defined in 27.8.3 (Transmit operating mode (TOM) indication) may set the MUEDCATimer[AC](#11989) for all ACs to 0 on receiving an immediate acknowledegment 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 HEMUEDCATimer[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].(#14239)