IEEE P802.11
Wireless LANs

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Abstract

This submission proposes resolutions of comments received from TGax LB225.

(The proposed change is based on TGax Draft 1.4.)

* CIDs: 5374 (1 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** |
| --- | --- | --- | --- | --- | --- |
| 5374 | 129.13 | 10.22.2 | It is not clear, what shall be done with LRC, SRC, CW[AC], etc, when a frame was transmitted several times with EDCA and then with UL OFDMA | Clarify | Revised- Agree in principle. Need to clarify the SSRC, SLRC, QSRC, QLRC, CW update rule for a new introduced features from 11ax. TGax editor makes changes as shown in the as specified in 11-17/1270r0.  |

**Discussion 1:**

A legacy STA (e.g., 802.11b/g/n/ac) updates the QLRC for controlling a long frame retransmission (the size of the long frame transmitted after the RTS/CTS is always greater than dot11RTSThreshold) occurred after the RTS/CTS transmission.

*A STA using the DCF shall use an RTS/CTS exchange for individually addressed frames when the length of the PSDU is greater than the length threshold indicated by dot11RTSThreshold.*

*QLRC[AC] shall be incremented every time transmission of an A-MPDU or frame in a PSDU of length greater than dot11RTSThreshold fails, regardless of the presence or value of the DEI field*

But, when the HE duration-based RTS is enabled, the problem of the existing rule is that the number of long frame retransmissions can unintentionally erased.

Please see the following example.



In this example, the length of the DATA frame is less than dot11RTSThreshold. But, the TXOP Duration is greater than 32 us \* dot11DurationRTSThreshold.

In that case, the RTS/CTS frames are exchanged before the DATA frame transmission.

After failures of the DATA frame transmission, QSRC is incremented because the length of the DATA frame is less than dot11RTSThreshold.

But, according the baseline spec, the QSRC is reset to 0 if the STA receives a valid CTS frame.

*If a valid CTS frame is not received, the short retry counter for the MSDU or MMPDU and the QSRC[AC] for the corresponding AC shall be incremented. If a valid CTS frame is received, the QSRC[AC] for the corresponding AC shall be reset to 0.*

As shown in the above example, QSRC and QLRC never record an actual number of DATA frame retransmissions. **In consequence, even though the actual number of DATA frame retransmissions is reached to the maximum limit, CW can’t be still reset.**

*If the QSRC[AC] or the QLRC[AC] has reached dot11ShortRetryLimit or dot11LongRetryLimit respectively, CW[AC] shall be reset to CWmin[AC].*

This issue is happened because the QSRC is used for controlling both the number of RTS frame retransmissions and the number of DATA frame retransmissions.

Probably, two separated variables have to be used to control the number of RTS frame retransmissions and the number of DATA frame retransmissions, respectively.

For addressing this issue, we propose to make a new variable (e.g., HE duration based RTS Retry Count (HDRRC)) for controlling the RTS frame retransmissions when the HE duration-based RTS is enabled.

10.22.2.11 Retransmit procedures

**10.22.2.11.1 General**

***TGax editor: change the sub-clause 10.22.2.11.1 as the following:***

After an RTS frame is transmitted to protect an MSDU or MMPDU, a QoS STA performs the CTS procedure, as defined in 10.3.2.7 (CTS and DMG CTS procedure). If a valid CTS frame is not received, the short retry counter for the MSDU or MMPDU and the QSRC[AC] for the corresponding AC shall be incremented. If a valid CTS frame is received, the QSRC[AC] for the corresponding AC shall be reset to 0. When the HE duration-based RTS is enabled, if a valid CTS frame is not received, the HDRRC[AC] for the corresponding AC should be incremented on behalf of QSRC[AC]. When the HE duration-based RTS is enabled, if a valid CTS frame is received, the HDRRC[AC] for the corresponding AC should be reset to 0 on behalf of QSRC[AC].

**10.22.2.2 EDCA backoff procedure**

***TGax editor: change the sub-clause 10.22.2.2 as the following:***

If the backoff procedure is invoked for reason c), d), e) or f) above, or the transmission failure of a non-ini-tial frame by the TXOP holder], the value of CW[AC] shall be updated as follows before invoking the back-off procedure:

* If the QSRC[AC] or the QLRC[AC] has reached dot11ShortRetryLimit or dot11LongRetryLimit respectively, CW[AC] shall be reset to CWmin[AC].
* If dot11RobustAVStreamingImplemented is true and either the QSDRC[AC] or the QLDRC[AC] has reached dot11ShortDEIRetryLimit or dot11LongDEIRetryLimit, respectively, CW[AC] shall be reset to CWmin[AC].
* If the HE duration-based RTS is enabled and the HDRRC[AC] has reached dot11ShortRetryLimit, CW[AC] shall be reset to CWmin[AC].
* Otherwise,

 — If CW[AC] is less than CWmax[AC], CW[AC] shall be set to the value (CW[AC] + 1) × 2 – 1.

 — If CW[AC] is equal to CWmax[AC], CW[AC] shall be left unchanged.

**3.4 Abbreviations and acronyms**

***TGax editor: Insert the following abbreviations into 3.4 in alphabetical order:***

HDRRC HE duration based RTS Retry Count

**Discussion 2:**

802.11ax draft 1.3 states that

*If an HE STA does not successfully receive the corresponding acknowledgement frame in response to the MPDU sent in an HE TB PPDU, the QSRC[AC] and QLRC[AC] for the associated EDCAF are not changed.(#9859)*

But, when an HE STA successfully receives the corresponding acknowledgement frame in response to the MPDU sent in an HE TB PPDU, the QSRC[AC] and QLRC[AC] for the associated EDCAF shall not be changed as well.

10.22.2.11 Retransmit procedures

**10.22.2.11.1 General**

***TGax editor: change the sub-clause 10.22.2.11.1 as the following:***

If an HE STA transmits ~~does not successfully receive the corresponding acknowledgement frame in response to the MPDU sent in~~ an HE TB PPDU, the QSRC[AC] and QLRC[AC] for the associated EDCAF are not changed.(#9859)