IEEE P802.11
Wireless LANs

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| Proposed resolution to DEI retry limit comments |
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Abstract

Comments 10, 28, 162, 164, 165, 166, 209, 314, 316, 318, 462, 668, 717, 719 and 723 from LB164 express concerns with how retry counters behave for frames with the DEI field set and the erroneous mention of the QoS control field (which at one point was going to be the location of the DEI field).

This document proposes changes to the P802.11aa draft to use new retry counters for frames with DEI=1, following the same structure as used by retry counters for QoS STAs. It creates new counters that are only incremented when drop-eligible frames are retried. The behaviour of the existing counters is unchanged to preserve compatibility with non-11aa STAs. This “backwards compatible” behaviour will require that dot11ShortDEIRetryLimit is less than or equal to dot11ShortRetryLimit and that dot11LongDEIRetryLimit is less than or equal to dot11LongRetryLimit. This seems a reasonable restriction as setting a longer retry on drop eligible frames does not make much sense.

This proposal is based upon P802.11aa draft 1.0 and P802.11REVmb draft 4.01

**3.3 Abbreviations and acronyms**

***Add the following abbreviations:***

QLDRC QoS long drop-eligible retry counter

QSDRC QoS short drop-eligible retry counter

Note to TGaa editor: Remove the text in 9.2.4 of the P802.11aa draft.

Note to TGaa editor: Remove the text in 9.2.5.3 of the P802.11aa draft.

9.9.1.5 EDCA backoff procedure

Note to TGaa editor: Remove the text in 9.9.1.5 of the P802.11aa draft that instructs changes to the fifth paragraph of 9.9.1.5.

Note to TGaa editor: Add the following to clause 9.9.1.5

***Change the eighth paragraph of 9.9.1.5 as follows:***

If the backoff procedure is invoked because of a failure event [reason c) or d) above or the transmission failure of a non-initial frame by the TXOP holder], the value of CW[AC] shall be updated as follows before invoking the backoff procedure:

* If the QSRC[AC] or the QLRC[AC] for the QoS STA has reached dot11ShortRetryLimit or dot11LongRetryLimit respectively, CW[AC] shall be reset to CWmin[AC].
* If the QSDRC[AC] or the QLDRC[AC] for the QoS STA has reached dot11ShortDEIRetryLimit or dot11LongDEIRetryLimit respectively, 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 remain unchanged for the remainder of any retries.

**9.9.1.6 Retransmit procedures**

***Change the first four paragraphs of 9.9.1.6 as follows:***

QoS STAs shall maintain a short retry counter and a long retry counter for each MSDU, A-MSDU, or MMPDU that belongs to a TC requiring acknowledgment. The initial value for the short and long retry counters shall be zero. QoS STAs also maintain a short retry counter and a long retry counter for each AC. They are defined as QSRC[AC] and QLRC[AC], respectively, and each is initialized to a value of zero. When dot11RobustAVStreamingImplemented is true, QoS STAs shall maintain a short drop-eligible retry counter and a long drop-eligible retry counter for each MSDU, A-MSDU, or MMPDU that belongs to a TC requiring acknowledgment. They are defined as QSDRC[AC] and QLDRC[AC], respectively, and each is initialized to a value of zero.

After transmitting a frame that requires an immediate acknowledgment, the STA shall perform eitherof the acknowledgment procedures, as appropriate, that are defined in 9.2.0b.9 (ACK procedure) and 9.10.3 (Data and acknowledgment transfer using immediate Block Ack policy and delayed Block Ack policy). The short retry count for an MSDU or A-MSDU that is not part of a Block Ack agreement or for an MMPDU shall be incremented every time transmission of a frame of length less than or equal to dot11RTSThreshold fails for that MSDU, A-MSDU, or MMPDU. When dot11RobustAVStreamingImplemented is true, the short drop-eligible retry count for an MSDU or A-MSDU that is not part of a Block Ack agreement or for an MMPDU shall be incremented every time transmission of a frame of length less than or equal to dot11RTSThreshold fails for that MSDU, A-MSDU, or MMPDU where the HT Control field is present and the DEI field is set. QSRC[AC] shall be incremented every time transmission of an A-MPDU or frame of length less than or equal to dot11RTSThreshold fails. When dot11RobustAVStreamingImplemented is true, QSDRC[AC] shall be incremented every time transmission of an A-MPDU or frame where the HT Control field is present, the DEI field is set and the length of the frame is less than or equal to dot11RTSThreshold fails. This short retry count and the QoS STA QSRC[AC] shall be reset when an A-MPDU or frame of length less than or equal to dot11RTSThreshold succeeds. When dot11RobustAVStreamingImplemented is true, the short drop-eligible retry count and the QoS STA QSDRC[AC] shall be reset when an A-MPDU or frame of length less than or equal to dot11RTSThreshold succeeds, regardless of the presence or value of the DEI field. The long retry count for an MSDU or A-MSDU that is not part of a Block Ack agreement or for an MMPDU shall be incremented every time transmission of a MAC frame of length greater than dot11RTSThreshold fails for that MSDU, A-MSDU, or MMPDU. When dot11RobustAVStreamingImplemented is true, the long drop-eligible retry count for an MSDU or A-MSDU that is not part of a Block Ack agreement or for an MMPDU shall be incremented every time transmission of a MAC frame of length greater than dot11RTSThreshold fails for that MSDU, A-MSDU, or MMPDU where the HT Control field is present and the DEI field is set. QLRC[AC] shall be incremented every time transmission of an A-MPDU or frame of length greater than or equal to dot11RTSThreshold fails. This long retry count and the QLRC[AC] shall be reset when an A-MPDU or frame of length greater than dot11RTSThreshold succeeds. When dot11RobustAVStreamingImplemented is true, QLDRC[AC] shall be incremented every time transmission of an A-MPDU or frame of length greater than or equal to dot11RTSThreshold fails where the HT Control field is present and the DEI field is set. This long drop-eligible retry count and the QLDRC[AC] shall be reset when an A-MPDU or frame of length greater than dot11RTSThreshold succeeds, regardless of the presence or value of the DEI field. All retransmission attempts for an MPDU that is not sent under a Block Ack agreement and that has failed the acknowledgment procedure one or more times shall be made with the Retry field set to 1 in the data or management frame.

Retries for failed transmission attempts shall continue until the short retry count for the MSDU, AMSDU, or MMPDU is equal to dot11ShortRetryLimit ~~or~~ until the long retry count for the MSDU, AMSDU, or MMPDU is equal to dot11LongRetryLimit, until the short drop-eligible retry count for the MSDU, AMSDU, or MMPDU is equal to dot11ShortDEIRetryLimit or until the long drop-eligible retry count for the MSDU, AMSDU, or MMPDU is equal to dot11LongDEIRetryLimit. When ~~either~~ any of these limits is reached, retry attempts shall cease, and the MSDU, A-MSDU, or MMPDU shall be discarded.

For internal collisions occurring with the EDCA access method, the appropriate retry counters (short retry counter for MSDU, A-MSDU, or MMPDU and QSRC[AC] or long retry counter for MSDU, AMSDU, or MMPDU and QLRC[AC]) are incremented. For internal collisions occurring with the EDCA access method where dot11RobustAVStreamingImplemented is true, the appropriate drop-eligible retry counters (short drop-eligible retry counter for MSDU, A-MSDU, or MMPDU and QSDRC[AC] or long drop-eligible retry counter for MSDU, AMSDU, or MMPDU and QLDRC[AC]) are incremented when the collision occurs for MSDU, A-MSDU or MMPDU that has drop eligibility set. For transmissions that use Block Ack, the rules in 9.10.3 (Data and acknowledgment transfer using immediate Block Ack policy and delayed Block Ack policy) also apply. STAs shall retry failed transmissions until the transmission is successful or until the relevant retry limit is reached.

**References:**