IEEE P802.11
Wireless LANs

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| 802.11 TGac WG Letter Ballot LB187Proposed resolutions to comment 4691 |
| Date: 2012-05-15 |
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Abstract

This submission contains proposed comment resolutions to comments received during WG letter ballot 187.

The comments included are non-editorial comment 4691 on Subclause 9.19.2.5.

There are 1 such comments: 4691.

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| **CID** | **By** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Proposed Resolution** |
| --- | --- | --- | --- | --- | --- | --- |
| 4691 | Liwen Chu | 109.45 | 9.17a | "The MU backoff procedure introduce the folowing issues:1, P117, L39 ""In addition, at the end of the transmissions, depending on the transmission results, a secondary AC shall invoke different backoff rocedures defined for either event b) or event c)."" Matching end of transmission to initial transmission C) is bad.2, It is not clear what to do when there are different acknowledge requirements of A-MPDUs in the first MU PPDU and acknowledge is not received.3, It is not clear how to do backoff during a MU TXOP." | Fix the problem. | REVISE. See resolution in document 12/0431r1 |

Resolution was deferred on Allan, David request.

Note: comment indicates clause 9.17a, but that is not correct; comment refers to clause 9.19.2.5

The comment refers to various aspects of the MU Backoff procdure and seeks clarifications.

Comment Part1

*1, P117, L39 ""In addition, at the end of the transmissions, depending on the transmission results, a secondary AC shall invoke different backoff rocedures defined for either event b) or event c)."" Matching end of transmission to initial transmission C) is bad.*

Discussion on Part 1

It is not clear what “at the end of the transmission” means; presumably it refers to the end of the TXOP, but event c) refers to the first frame of the TXOP, hence there is an inconsistency.

Moreover, since the channel access was acquired by the primary AC, the outcome of the initial or last frame exchange feeds back on the backoff for primary AC only. This keep the backoff procedure aligned with the SU case.

**Instructions to the Editor: delete this paragraph (at P117, L39).**

"In addition, at the end of the transmissions, depending on the transmission results, a secondary AC shall invoke different backoff procedures defined for either event b) or event c)."

Comment Part 2

*2, It is not clear what to do when there are different acknowledge requirements of A-MPDUs in the first MU PPDU and acknowledge is not received.*

Dicussion on Part 2

*P117L16: The backoff procedure shall be invoked for an EDCAF when any of the following events occurs:*

1. *[…]*

*b) The final transmission by the TXOP holder initiated during the TXOP for that AC was successful*

*and the TXNAV timer has expired.*

*c) The expected immediate response to the initial frame of a TXOP of that AC is not received,*

c) Is very well defined

Regarding b), the following definition is also clear

*For the purposes of this subclause, successful transmission and transmission failure of an MPDU are defined as follows:*

*— After transmitting an MPDU (regardless of whether even if it is carried in an A-MPDU or as part of*

*an MU PPDU) that requires an immediate frame as a response, the STA shall wait for a timeout*

*interval of duration of aSIFSTime + aSlotTime + aPHY-RX-START-Delay, starting at the PHYTXEND.*

*confirm. If a PHYRXSTART.indication does not occur during the timeout interval, the*

*STA concludes that the transmission of the MPDU has failed.*

*A The transmission of an MPDU that does not require an immediate frame as a response is defined*

*as a successful transmission, unless it is one of the non-final (re)transmissions of an MPDU that is*

*delivered using the GCR unsolicited retry retransmission policy (9.19.2.6.2)*

Note: This condition seamlessly applies to MU also; based on above definition of successful transmission

* either all the MPDUs have no-ACK/delayed BA policy: they are successful by definition because no response is expected
* one of the A-MPDUs includes MPDUs with immediate BA policy and is successful if there is an immediate BA

To further clarify:

**Instruction to the editor: modify P117L20**

 “The ~~final~~ transmission of all the MPDUs in the final PPDU initiated by the TXOP holder ~~initiated~~ during the TXOP for that AC was successful and the TXNAV timer has expired*”*

Comment Part 3

*3, It is not clear how to do backoff during a MU TXOP.*

The backoff procedure for MU-MIMO should preserve the EDCA fairness properties among EDCAF within the same AP and across the EDCAF of different APs and STAs, whether they support MU-MIMO or not. Also it is advisable that the procedure be as simple as possible while achieving these goals.

A simple way to achieve above goals is to preserve the EDCA behavior originally defined for SU transmission with no changes to the backoff procedure. This ensures that EDCA preserves the medium access faireness properties, while the secondary AC benefits from the piggybacked transmission.

The existing text, as amended above, is conforming to such a goal, except for the following highlited text, which is a departure from the SU procedure:

*d) The transmission attempt collides internally with another EDCAF of an AC that has higher priority,*

*that is, two or more EDCAFs in the same STA are granted a TXOP at the same time and the*

*EDCAF of the lower priority AC is not sharing the TXOP with the winning AC through TXOP sharing*

*mode.*

*…*

*In event d) above, if an internal collision can be resolved by one or more secondary ACs sharing the MU*

*TXOP for downlink transmission, the one or more secondary ACs shall keep their CW[AC]s and backoff timer values unchanged before transmitting in a MU TXOP.*

A basic principle of EDCA is that a collision feeds back on the CW size so that an adaptive behaviour is achieved. In the baseline, internal collisions results in a increased CW for the lower priority AC and that is done on purpose to guarantee the sepration among ACs.

The above text removes this basic feature resulting in an altered fairness

* within the STA: the secondary AC does not increase the CW so that at the next channel access (whether MU or SU) the secondary AC will heve an advantage (shorter CW) over the primary AC.
* with respect to other STAs: the secondary AC of MU AP does not increase the CW, whereas, in the same exact internal collision scenario, a non-MU STA secondary AC will: i.e. the secondary AC of the MU AP will have an advantage over the same AC of a SU STA.

Moreover, preserving the red text also requires further additions to the specs to fix a related issue;

In fact, after the internal collision, both primary and secondary AC will have a 0 backoff counter, and ther is no text stating how the secondary backff is re-initialized.

Since no benefit was shown from modifying the baseline backoff procedure, and some drawbacks have been pointed out, the proposal is to remove the red text.

This also achieves the goal of the commenter in that the backoff procedure is as in SU case and hence well defined and simple.