IEEE P802.11
Wireless LANs

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| Resolution CID 70905144 on 11mc/D4.0  |
| Date: 2016-15-02 |
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Abstract

This submission proposes resolution for CID 7090 on D5.0 (CID 5144 on 11mc/D4.0).

Green indicates material agreed to in the group,

yellow material to be discussed, red material rejected by the group and

cyan material not to be overlooked.

The “Final” view should be selected in Word.

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| Identifiers | Comment | Proposed change |
| CID 7090Adrian10.23.11374.05 | "EDCA TXOPs of a mesh STA that has dot11MCCAActivated true shall not overlap with the time periods of any of its tracked MCCAOP reservations." -- but the section on EDCA doesn't describe how to do it, and contains lots of "may transmit" statements. | This was CID 5144 on D4.0.  15/1250r3 was prepared with proposed resolution.  The resolution depends upon other changes which had not been agreed upon.  Hence this propasal was pu tto one side.  15/1250 will be updated to reference D5.0 and re-presented |

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| Identifiers | Comment | Proposed change |
| CID 5144Adrian9.23.11347.21 | "EDCA TXOPs of a mesh STA that has dot11MCCAActivated true shall not overlap with the time periods of any of its tracked MCCAOP reservations." -- but the section on EDCA doesn't describe how to do it, and contains lots of "may transmit" statements. | In 9.22.2 add constraints that a TXOP cannot be gained under EDCA during one of these tracked time conditions, and the TXOP duration is limited so the TXOP does not extend into any such period. |

Discussion:

“The MCCAOP is an interval of time for frame transmissions that has been reserved by means of the exchange of MCCA frames (see 9.23.3 (MCF controlled channel access (MCCA))).

EDCA TXOPs of a mesh STA that has dot11MCCAActivated true shall not overlap with the time periods of any of its tracked MCCAOP reservations.”

10.22.2.4 Obtaining an EDCA TXOP

(Note: EDCAF is EDCA function of which there are 4.)

The idea of a TXOP is that when the STA gains access it gains the TXOP. Within the TXOP the STA obtaining a TXOP (the TXOP holder) maintains uninterrupted control of the medium (not exceeding the TXOP Limit).

MCCAOP Reservations are explained in 9.23.3.3. An MCCAOP reservation specifies a schedule for frame transmissions. However, during an MCCAOP the mesh STA still contends using EDCA.



So the MCCAOP Duration is 1 octet in length and specifies the MCCAOP in multiples of 32 us

ASIDE: 8 bits is 256, 256 x 32us = 8192us. However, 6.3.79.3.2 (P415.53) gives the “Valid Range” as 0 – 65535, it should be 0 – 255. Correct this as well?

So it is perfectly possible, that an EDCA TXOP can be longer than an MCCAOP duration.

Now the commenter wants to

1. Stop any TXOP during an MCCAOP
2. Restrict the TXOP during an MCCAOP.

If we do a) then we do not need b). Is the cited text saying a) or b)? Also need to clarify what is meant by ‘overlap’ and what is a ‘tracked’ MCCAOP reservation.

Tracked MCCAOP Reservation, for me, would include those for me and those for my neighbors. Hence, only if the MCCAOP is for my neighbors should I restrain from transmitting. If it is for me, then of course I may transmit.

Hence, the idea, as I see it, is to

1. **If a neighbour**, do not transmit within an MCCAOP for which you are not a member
2. Do not transmit outside of the MCCAOP for which you are a member.

I think that 1 is covered clearly in 10.23.3.1

1347.39 states:

An MCCA enabled neighbor mesh STA shall not transmit during these reserved MCCAOP time periods..

Also 1384.47 “…,a neighboring STA shall not access the WM during an MCCAOP, until it receives a frame

from either the MCCAOP owner or the MCCAOP responder.”

So we need to cover 2) do not exceed the TXOP limit.

The place to add text seems to be in 10.22.2.8 TXOP limits which is the only section that talks about “The duration of a TXOP”. At the end seems appropriate. P1359.1

The suggested text (below):

The first part of the proposed text is to deal with the transmission of packets within the TXOP and MCCAOP, the second is to stop the transmission of even one packet if is exceeds the MCCAOP.

Proposed Resolution

REVISED

“At the end of 10.22.2.8 P 1359.12 add the following:

“The duration of a TXOP for a mesh STA that has dot11MCCAActivated true shall not exceed the time between the start of the TXOP and the end of the MCCAOP reservation ends. A mesh STA that has dot11MCCAActivated true that obtains a TXOP shall not transmit or cause to be transmitted (as responses) any PPDU or MMPDU that will extend beyond the end of the MCCAOP reservation.”

*Adrian:*

*The intentent of the MCCAOP reservation is clear. A sta wants its neighbors not to transmit during this reservation.*

*If a STA is using EDCA, then this means exactly:*

1. *Don’t start a TXOP during a reserved period*
2. *Stop a TXOP before any next reserved period.*

*You can handle 1 possibly by adding MCCAOP reservation as a type of virtual carrier sense.*

*I don’t see any way to avoid adding a statement to handle this.*

*I think the “starting” case is pretty similar to the TXNAV case, and resolution of comment 5141 in doc 1010r13 hopefully addresses this with the following changes:*

GRAHAM

Just to be clear, it should read

1. If a neighbour, do not transmit within an MCCAOP for which you are not a member
2. Do not transmit outside of the MCCAOP for which you are a member.

Adrian has proposed proposed edits to EDCA procedure to correct applications of TXNAV and then, once that is done, add MCCAOP to it.

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First of all TXNAV:

“The TXNAV timer is a timer that is initialized with the duration from the Duration/ID field in the frame most recently successfully transmitted by the TXOP holder, except for PS-Poll frames. The TXNAV timer begins counting down from the end of the transmission of the PPDU containing that frame.”

All below, at first sight, appears to be the solution to a different comment, i.e. back off procedure decription. Adrian’s point is that the instruction to stay off the medium until the NAV timer has extinguished is valid and not included in the instructions. Then, once having added the TXNAV time, we can add in the MCCAOP reservation time. Now, however, we probably need another timer that counts down from the start of the MCCAOP.

ACTUALLY THERE IS ONE, the “RAV Timer”

While we are at it, the description for TXNAV timer, and RAV timer should precede their use in text.

I have tried to look at all instances of “TXNAV” plus Adrian’s additions, and made an attempt to include, if relevant, the RAV timer.

So it may be you can get away with adding “or no current MCCAOP reservation is active” where TXNAV is mentioned.

Regarding limiting the TXOP, you need new text probably in 10.22.2.8 that says something like:

A mesh STA that has MCCAOP reservations active ***(this needs improvement)*** shall truncate its TXOP so that the TXOP completes before the next MCCAOP reservation starts.

Proposed Resolution

REVISED

At the end of 10.22.2.8 P 1359.1 add the following:

“The duration of a TXOP for a mesh STA that has dot11MCCAActivated true shall not exceed the time between the start of the TXOP and the end of the MCCAOP reservation. A mesh STA that has dot11MCCAActivated true that obtains a TXOP shall not transmit or cause to be transmitted (as responses) any PPDU or MMPDU that will extend beyond the end of the MCCAOP reservation.”

Move text from 10.22.2.7 P1356.12 and insert at 10.22.2.2 P1350.11 with the following changes:

“The TXNAV timer is a single timer, shared by the EDCAFs within a STA, that is initialized with the duration from the Duration/ID field in the frame most recently successfully transmitted by the TXOP holder, except for PS-Poll frames.(#2458) The TXNAV timer begins counting down from the end of the transmission of the PPDU containing that frame. An(#2458) HT STA may retransmit unacknowledged MPDUs within the same TXOP or in a subsequent TXOP.

Then insert the following text after the text above:

“The Reservation Allocation Vector (RAV) timer for a mesh STA that has dot11MCCAActivated true is initialized with the MCCAOP Duration in the MCCAOP Reservation field at the start of an MCCAOP reservation. The RAV timer begins counting down from the start of an MCCAOP reservation (see 9.23.3.9.2)”

At 1350.12 Make changes as shown

“The backoff procedure shall be invoked by(#2458) an EDCAF when any of the following events occurs:

* An MA-UNITDATA.request primitive is received that causes a frame with that AC to be queued for transmission such that one of the transmit queues associated with that AC has now become non-empty and any other transmit queues associated with that AC are empty;(#1439) the medium is busy on the primary channel(11ac) as indicated by physical CS, virtual CS, a non-zero TXNAV timer value; or, for a mesh STA that has dot11MCCAActivated true, a non-zero RAV timer value and the backoff timer has a value of 0 for that AC.”

At 10.22.2.4 P1351.57, make changes as shown

* Following AIFSN[AC] × aSlotTime – aRxTxTurnaroundTime of idle medium after SIFS (not -necessarily medium idle during the SIFS(#156)) after the last busy medium on the antenna that was the result of a transmission of a frame for any EDCAF and which did not require an acknowledgment and after the expiration of the TXNAV timer if non-zero, and, for a mesh STA that has dot11MCCAActivated true, the expiration of the RAV timer if non-zero.

At 10.22.2.7 P1356.25, make changes as shown

“…the duration of transmission of that frame plus any expected acknowledgment for that frame is less than either the remaining TXNAV or, for a mesh STA that has dot11MCCAActivated true, TXMCCAOP timer value, then the TXOP holder may commence transmission of that frame a SIFS (or RIFS, if the conditions defined in 10.3.2.3.2 (RIFS) are met) after the completion of the immediately preceding frame exchange sequence, subject to the TXOP limit restriction as described in Figure 10.22.2.8 (TXOP limits). A STA shall not commence the transmission of an RTS with a bandwidth signaling TA until at least PIFS time after the immediately preceding frame exchange sequence. An HT STA that is a TXOP holder may transmit multiple MPDUs of the same AC within an A-MPDU as long as the duration of transmission of the A-MPDU plus any expected BlockAck frame response is less than either the remaining TXNAV or, for a mesh STA that has dot11MCCAActivated true, RAV timer value.

At 1356.45, make changes as shown

 “…provided that the duration of that transmission plus the duration of any expected acknowledgment and applicable IFS is less than either the remaining TXNAV or, for a mesh STA that has dot11MCCAActivated true, RAV timer value. At the expiry of the TXNAV and, for a mesh STA that has dot11MCCAActivated true, the RAV timer, if the channel access function has not regained access to the medium, then the EDCAF shall invoke the backoff procedure that is described in 10.22.2.10 (Retransmit procedures). Transmission failure is defined in 10.22.2.10 (Retransmit procedures).”

At 1356.52 delete

“All other channel access functions at the STA shall treat the medium as busy until the expiry of the TXNAV timer.”