IEEE P802.11  
Wireless LANs

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| Sub-Clause 9.19 Comments Resolutions (Part 2) | | | | |
| Date: 2012-04-26 | | | | |
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This document provides resolutions for comments in sub-clause 9.19 of draft spec D2.0. This is the second part of a total 4 presentations for this sub-clause. All CIDs are for the MAC ad hoc.

* Sub-clause 9.19.2.3: 4162, 4163, 4665
* Sub-clause 9.19.2.4: 4539, 4618, 4407, 4165, ~~4667~~ (reassigned to Mark Rison, 4/26/2012)

**Sub-clause 9.19.2.3: 4162**

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 4162  Ahmadreza Hedayat | 114.13 | 9.19.2.3 | The defenition of "idele medium" and "busy medium" are given in the first paragraph of this subclause and there is no need to repeat them here again. | Remove lines 13-14. | **Accepted** |

**Discussion:**

As the commenter pointed out, the first paragraph of this sub-clause clearly says the following,

When a STA and the BSS of which the STA is a member both support multiple channel widths, an EDCA

TXOP is obtained based solely on activity of the primary channel. "Idle medium" in this subclause means

"idle primary channel". Likewise "busy medium" means "busy primary channel".

**Proposed Resolution:**

Remove duplicated text.

TGac Editor, please remove text between P114L13 and P114P14.

**Sub-clause 9.19.2.3: 4163**

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 4163  Ahmadreza Hedayat | 114.19 | 9.19.2.3 | This bullet needs to be clarified as currently the language is vague. Also "... using the same antenna as was used during the reception of a frame with a correct FCS ..." makes things more complicated. If the concern of using the same antenna needs to stated here then it needs to be stated in many other places in the spec. | Remove the concern of using the same anetnna from this bullet. Alternatively, one can add this as a general rule somewhere else. | **Revised**  The latest REVmb draft has fixed this. |

**Discussion:**



The timeline and requirements for determining a slot boundary are listed in the above figure to facilitate the discussion.

The latest REVmb (D12) reads: “Following AIFSN[AC] × aSlotTime – aRxTxTurnaroundTime of idle medium after SIFS (not necessarily idle medium during the SIFS duration) after the last busy medium on the antenna that was the result of a reception of a frame with a correct FCS.”

The only difference between these two, if there is any, is that TGac draft D2.0 emphasizes on “the same antenna” while the REVmb text didn’t say it explicitly. However, the REVmb text kind of says it implicitly. Therefore, there is no need to change the current text as in REVmb D12.

**Proposed Resolution:**

Remove changes made by TGac and refer to latest REVmb text.

TGac Editor, please remove spec text (D2.0, P114L16-L24).

**Sub-clause 9.19.2.3: 4665**

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 4665  Kaiying | 114.25 | 9.19.2.3 | aSIFSTime was lost in many places, and the same kind of issue has been fixed in Revmb r11. | Fix this issue according to latest Revmb. | **Revised** |

**Proposed Resolution:**

Remove the related text from TGac draft spec so that the latest REVmb text (D12 or later) always apply.

TGac Editor, please remove the following draft text (D2.0, P114L25-L51).

b) Following EIFS – DIFS + AIFSN[AC] × aSlotTime – aRxTxTurnaroundTime of idle medium after

the last indicated busy medium as determined by the physical CS mechanism that was the result of a

frame reception that has resulted in FCS error, or PHY-RXEND.indication (RXERROR) primitive

where the value of RXERROR is not NoError.

c) When any other EDCAF at this STA transmitted a frame requiring acknowledgment, the earlier of

1) The end of the ACK-Timeout interval timed from the PHY\_TXEND.confirm primitive,

followed by AIFSN[AC] x aSlotTime + aSIFSTime – aRxTxTurnaroundTime of idle medium,

and

2) The end of the first AIFSN[AC] × aSlotTime – aSIFSTime - aRxTxTurnaroundTime of idle

medium after SIFS (not necessarily medium idle during the SIFS duration, the start of the SIFS

duration implied by the length in the PLCP header of the previous frame) when a PHYRXEND.

indication primitive occurs as specified in 9.3.2.9 (ACK procedure).

d) Following AIFSN[AC] × aSlotTime – aSIFSTime - aRxTxTurnaroundTime of idle medium after

SIFS (not necessarily medium idle during the SIFS duration) 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.

e) Following AIFSN[AC] × aSlotTime – aRxTxTurnaroundTime of idle medium after the last

indicated idle medium as indicated by the CS mechanism that is not covered by a) to d).

**Sub-clause 9.19.2.4: 4539 (4/26/2012)**

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| 4539  David Hunter | 115.43 | 9.19.2.4 | Since this is a normative statement, it seems to include a requirement that a VHT NDP frame shall not be transmitted unless it immediately (SIFS) follows an NDP Announcement frame. Is that accurate? If so, this requirement should be stated more clearly. | Specify somewhere that a VHT NDP frame shall not be transmitted unless it immediately (SIFS) follows the transmission of an NDP Announcemment frame. | **Revised** |

**Discussion:**

Although the spec describes a valid sequence for NDPA/NDP, it would be helpful to state this requirement explicitly.

**Proposed Resolution:**

TGac Editor, please insert the following text in the beginning of L28 of P131 of TGac D2.1.

A VHT NDP shall be transmitted only following a SIFS after a VHT NDP announcement frame. A VHT NDP announcement frame shall be followed by a VHT NDP after SIFS. A beamformer shall not transmit a frame other than a VHT NDP a SIFS period(#5422) after a VHT NDP

Announcement(#4921) frame.

**~~Sub-clause 9.19.2.4: 4667~~**

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 4667  Kaiying | 115.44 | 9.19.2.4 | A frame exchange may be an NDPA followed by a VHT NDP and followed by a correctly received VHT Compressed Beamforming frame or at least one segment of a VHT Compressed Beamforming frame. | as modified."A frame exchange may be......an NDPA followed by a VHT NDP and followed by a correctly received VHT Compressed Beamforming frame or at least one segment of a VHT Compressed Beamforming frame, or......." | **Accepted**  **Status: this CID has been resigned to Mark Rison (4/26/2012).** |

**Sub-clause 9.19.2.4: 4618 (4/26/2012)**

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| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 4618  Jing-Rong Hsieh | 116.01 | 9.19.2.4 | To obtain a TXOP, based on current description, it is not clear if the transmission result of initial frame covers the entire MU PPDU including both primary AC and secondary ACs or the primary AC only. | Clarify it. | **Revised**  **Status: waiting for Youhan’s review (4/26).** |

**Discussion:**

It is true that in the MU MIMO case the immediate response of the initial frame may not be for the primary AC. There are two options to resolve this comment.

1. Request the first BA must be for the primary AC. This option makes the resolution simple and maybe makes more sense if we only care about the acquisition of the TXOP. However, it introduces a new constrain to the BA transmission, which makes the scheduling complex.
2. Relax the above “first BA must be for primary AC” requirement so that the first BA, whether for a primary AC or for a secondary AC, will confirm the acquisition of the TXOP. This aligns well with the definition of transmission failure; when the first BA is lost, the transmission is considered failed and the backoff procedure is invoked. In addition, this is not the right place to describe how to obtain the TXOP; if a frame was sent then it means the EDCAF already got the TXOP. This section describes the conditions that allow to send additional multiple frames in a TXOP. Obtaining a TXOP is described in 9.19.2.3, “Obtaining an EDCA TXOP”.

Based on this discussion, Option 2) is preferred.

A further issue brought up by this comment is that, the spec does not mention how the obtained channel width is determined; whether it is based on the BW of the initial frame, or the BW of the response frame to the initial frame. As a result of the discussion on the reflector, the following sentences are to be added.

“The channel width obtained for a TXOP is the bandwidth of the initial frame of the TXOP, if the initial frame does not have a Signaling TA or does not require a response. The channel width obtained for a TXOP is the bandwidth of the response to the initial frame if the initial frame has a Signaling TA and requires a response.”

**(Thanks to Simone, Adrian, Matt, Mark, Liwen and Jing-Rong for their contributions to this comment resolution)**

**Proposed Resolution:**

TGac Editor, please remove the following text (TGac D2.1, P118L51-L52).

A TXOP is obtained after a STA transmitting an initial frame successfully receives a response frame, or the initial frame is a CTS-to-self.

TGac Editor, please insert text before “When a TXOP is obtained for a channel width …” as shown below (TGac D2.1, P118L52).

~~A TXOP is obtained after a STA transmitting an initial frame successfully receives a response frame, or the initial frame is a CTS-to-self.~~ The channel width obtained for a TXOP is the bandwidth of the initial frame of the TXOP, if the initial frame does not have a Signaling TA or does not require a response. The channel width obtained for a TXOP is the bandwidth of the response to the initial frame if the initial frame has a Signaling TA and requires a response. When a TXOP is obtained for a channel width(#4406) that is greater than 20 MHz by a(#4406) non-HT duplicate frame exchange, the TXOP holder may transmit PPDUs using CH\_BANDWIDTH that are up to and including the bandwidth obtained for the TXOP. During the TXOP, the TXOP holder shall not transmit PPDUs with the TXVECTOR parameter CH\_BANDWIDTH set to a value indicating a channel width greater than the channel width(#4406) obtained for the TXOP. If a TXOP is protected by a(#4406) non-HT or a(#4406) non-HT duplicate RTS/CTS, the TXOP holder shall set the TXVECTOR parameter CH\_BANDWIDTH of a PPDU as follows:

**Sub-clause 9.19.2.4: 4407**

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| 4407  Brian | 116.23 | 9.19.2.4 | "same or narrower ... first non-HT dup" Presumaby this rule applies to frames after the first non-HT dup? | Probably have to rearrange, but I expect a notion of "a PDDU sent after the non-HT dup" | **Revised** |

**Proposed Resolution:**

TGac Editor, please change the existing text (TGac D2.0, P116L20-24) as below.

If there is no RTS/CTS exchange in non-HT duplicate format in a TXOP and there is at least one non-HT

duplicate frame exchange in a TXOP, the TXOP holder shall set the CH\_BANDWIDTH parameter in TXVECTOR of a PPDU sent after the first non-HT duplicate frame to be the same or narrower than the CH\_BANDWIDTH parameter in TXVECTOR of the initial frame in the first non-HT duplicate frame exchange in the same TXOP.

**Sub-clause 9.19.2.4: 4165**

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| 4165  Ahmadreza Hedayat | 116.27 | 9.19.2.4 | This seems to limit the BW of the furure frame exchanges in the TXOP by the min BW of the preceding transmitted PPDUs. However, it seems it needs to be limited by the max of the BW of the preceding transmitted PPDUs. | Fix it so that the max BW of the previously transmitted PPDUs become the limit (which the new PPDU needs to have the same BW or narrower). | **Rejected** |

**Discussion:**

This is not about the minimum or the maximum value, but the CH\_BANDWIDTH of the preceding PPDU; i.e. the PPDU that was transmitted immediately before it. Of course the result of this rule is that the BW can only get smaller. And I believe this is the intent.