IEEE P802.11
Wireless LANs

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| Resolutions to CIDs related to TDD Scheduling, Channel Access and Power Save-Part 3 |
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Abstract

This submission proposes resolutions to 10 CIDs related to TDD scheduling, MIMO channel access and power save. These CIDs include:

3096 3463 3474 3735 3664 3669 3716 3737 3738 3739

The CIDs are in reference to Draft IEEE 802.11ay/D2.0, the proposed resolutions are in reference to Draft IEEE 802.11ay/D2.1 and IEEE 802.11REVmd\_D1.5.

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| CID | Clause | Comment | Proposed change |
| 3096 | 10.3.2.9 P175 L31 | CTS and DMG CTS procedure is silent about the use of static and dynamic mode consistent with the VHT. The current text in 11ay seems to suggest that the channel BW and channel for the TXOP will be set by the CTS. The is similar to the dynamic mode of VHT, in which the BW set in the CTS shall be less than or equal to the BW set in the RTS.  The static mode could be usueful in whihc allows the initiator set the precedence of the BW used in the TXOP. | Clearly specify the rules related to dynamics and static model. |

**Discussion:**

1. Letting CTS to determine the channel BW and channel for the TXOP in cases of channel bonding/aggregation is to make sure the initiator will not occupy secondary channels that are busy. Otherwise if it is solely determined by the initiator, it is easy to create interference for other ongoing transmissions in secondary channels.

11ay is also motivated not to do static since BW since CCA is directional unlike legacy WiFi. In 2.4G/5G the CCA done by the initiator will be mostly likely the same result as the responder CCA. However, this is not the case for 60GHz.

1. If the initiator does not want partial BW requested, it can always send a CF-END frame, and the responder can also send a CF-END frame to enable 3rd-party STAs to reset the NAV (see 9.3.1.6).
2. Talked to the commenter and agreed that we can resolve this CID by adding the following rule:

If the initiator sends an RTS and requests a wide channel, and the responder performs the CCA and finds all the primary and secondary channels of the requested wide channel are idle, then the responder shall send CTS on all the primary and secondary channels back to the initiator.

**Proposed resolution:** Revised

*Change 10.3.2.9 as follows:*

An EDMG STA that is addressed by an RTS frame sent in non-EDMG duplicate PPDU format to establish a TXOP shall behave as follows:

* If the NAV in the primary channel indicates idle:
	+ The STA shall respond with a DMG CTS frame transmitted in non-EDMG or non-EDMG duplicate PPDU format after a SIFS.
	+ In case the DMG CTS frame is sent in a non-EDMG duplicate PPDU format in response to an RTS sent to establish a TXOP for the transmission of a SISO or an MU PPDU, the TXVECTOR shall be configured as follows:
		- The SCRAMBLER\_INIT\_SETTING parameter shall be set to indicate Channel\_BW if the channel combinations are covered in Table 47, otherwise it shall be set to indicate CONTROL\_TRAILER and the parameter CT\_TYPE shall be set to CTS\_DTS; and
		- If the CCA of all the channels that were indicated in the RTS’s RXVECTOR parameter CH\_BANDWIDTH\_SIGNALING were idle for a duration of PIFS prior to the start of the RTS frame,  the CH\_BANDWIDTH parameter shall be exactly the same as that were indicated in the RTS’s RXVECTOR parameter CH\_BANDWIDTH\_SIGNALING. Otherwise, the CH\_BANDWIDTH parameter shall be set to a subset of the channels that were indicated in the RTS’s RXVECTOR parameter CH\_BANDWIDTH\_SIGNALING encoded as defined in Table 47 or in the control trailer and where the CCA of such channels were idle for a duration of PIFS prior to the start of the RTS frame; and
		- The CH\_BANDWIDTH\_SIGNALING parameter shall be set to the encoded value of the set of channels indicated by the CH\_BANDWIDTH parameter as defined in Table 47 or in the control trailer.
	+ In case the DMG CTS is sent in a non-EDMG duplicate PPDU format in response to an RTS sent to establish a TXOP for the transmission of an SU MIMO PPDU, the TXVECTOR shall be configured as follows:
		- The SCRAMBLER\_INIT\_SETTING parameter shall be set to indicate CONTROL\_TRAILER and the parameter CT\_TYPE shall be set to CTS\_DTS; and
		- If the CCA of all the channels that were indicated in the RTS’s RXVECTOR parameter CH\_BANDWIDTH\_SIGNALING were idle for a duration of PIFS prior to the start of the RTS frame,  the CH\_BANDWIDTH parameter shall be exactly the same as that were indicated in the RTS’s RXVECTOR parameter CH\_BANDWIDTH\_SIGNALING. Otherwise, the CH\_BANDWIDTH parameter shall be set to a subset of the channels that were indicated by the RTS’s RXVECTOR parameter CH\_BANDWIDTH and for which the CCA of such channels were idle for a duration of PIFS prior to the start of the RTS frame.

*Change 10.3.2.18 as follows:*

If a TXOP is established to send PPDUs using a single transmit chain and the number of bits set to 1 in the CH\_BANDWIDTH parameter is greater than 1:

* The RTS frame shall be sent in non-EDMG duplicate PPDU format; and
* The TXVECTOR parameter SCRAMBLER\_INIT\_SETTING shall be set to Channel\_BW for channel combinations covered in Table 47, otherwise for those combinations that are not covered in Table 47, the TXVECTOR parameter SCRAMBLER\_INIT\_SETTING shall be set to CONTROL\_TRAILER.; and
* The TXVECTOR parameter CH\_BANDWIDTH\_SIGNALING shall be set to the encoded value of the set of channels indicated by the CH\_BANDWIDTH parameter as defined in Table 47 or in the control trailer.

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| CID | Clause | Comment | Proposed change |
| 3463 | 10.73.1P309 L13 | The AMPDU contans MPDUs with TIDs that corresponds to the primary AC'This is not always true in the case of DL-MU because AMPDU to STA1 may have primary AC MPDUs but AMPDU to STA2 may not have primary AC MPDUs | condition the bullut on the case of AMPDU in a SU-PPDU |

**Discussion:**

The rule applies to individual A-MPDU addressed to each STA, not across A-MPDUs addressed to multiple STAs.

**Proposed resolution:** Rejected

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| CID | Clause | Comment | Proposed change |
| 3474 | 10.24.2.13P186 L22 | From the resolution of CID 1733 (LB 231), "Besides, this paragraph is just duplicated from VHT in REVmd".   Let's not reproduce/continue prior mistakes.  Just add a sentence that no channel list present means all channels are idle. | Add a sentence, "If the MAC receives a PHY-CCA.indication primitive with no channel-list parameter present, all channels are considered idle." |
| 3735 | 10.24.2.13 P186 L23 | "If the MAC receives a PHY-CCA.indication primitive with the channel-list parameter present, the channels considered busy are defined in Table 36."Which channel is busy is not relevant on the protocol description.For deciding a transmission bandwidth of a PPDU, knowing which channels were idle is needed.On this purpose, previous 11n/11ac/11ax spec have defined the idle channel list.Define how to determine the idle channels from the PHY-CCA.indication primitive. | As in the comment. |

**Proposed resolution:** Revised

*Add the following sentence to the end of the first paragraph of 10.24.2.13:*

Channels not indicated as busy are considered idle.

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| CID | Clause | Comment | Proposed change |
| 3664 | 9.7.3P173 L1 | "Except for the EOF subfield, all Block Ack Schedule frame subfields have the same value."  There is no EOF subfield in the frame (9.3.1.23 Block Ack Schedule frame format) | Remove the sentence "Except for the EOF subfield, all Block Ack Schedule frame subfields have the same value." |

**Proposed resolution:** Revised

*Change the last row of “Block Ack Schedule” as follows:*

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| Block Ack Schedule | In an EDMG BSS, one or more copies of the Block Ack Schedule frame is present when transmitted within an EDMG MU PPDU. ~~Except for the EOF subfield, a~~All Block Ack Schedule frame subfields have the same value.  |

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| CID | Clause | Comment | Proposed change |
| 3669 | 9.3.1.8.7P70 L5 | Where is the "EDMG Compressed BlockAck frame" defined?  It took me quite some time to work out that this is a BlockAck frame with the EDMG Compressed variant. I think the terminology in the text is very confusing, as it's not possible to find the definition of a "EDMG Compressed BlockAck frame". | Change "EDMG Compressed BlockAck frame" to "BlockAck frame EDMG Compressed variant".  Incidentally, I realise that this would result in similar changes to Draft P802.11REVmd\_D1.2.pdf.  Talking of which, there's an error in Draft P802.11REVmd\_D1.2.pdf, Page 802, Line 60 (Clause 9.3.1.8.4), as the text should refer to "Extended Compressed BlockAck frame", or as I would prefer it "BlockAck frame Extended Compressed variant". |

**Proposed resolution:** Revised

TGay editor to change the name to EDMG Compressed BlockAck frame variant.

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| CID | Clause | Comment | Proposed change |
| 3716 | 9.3.1.8.1P69 L6 | Why is a Management Ack subfield needed? Will it be acknowledged by a bitmap like data frames? But it says "The multi-TID A-MPDU may contain no more than one Management frame, with exception of Action no Ack frames which can occur more than once." in p.208. So, that should not be true. Then, why can't it be acknowledged like the multi-STA BlockAck in 11ax using Ack Type subfield and no bitmap? | Clarify the meaning of Management Ack subfield. Delete it if a Management frame can be acknowledged like the same with the multi-STA BlockAck in 11ax. |

**Discussion:**

1. We don’t have the multi-STA BlockAck in 11ay, so cannot use this to acknowledge management frames.
2. The definition of the subfield is already in 9.3.1.8.1.

**Proposed resolution:** Rejected

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| CID | Clause | Comment | Proposed change |
| 3737 | 10.24.2.13 P187 L6 | a) Transmit a 8.64 GHz mask PPDU if...b) Transmit a 4.32+4.32 GHz mask PPDU if...c) Transmit a 6.48 GHz mask PPDU if...d) Transmit a 4.32 GHz mask PPDU if...e) Transmit a 2.16+2.16 GHz mask PPDU if...Can the STA transmit PPDU in any channel? Otherwise, please specify the channel like the bullet f. | As in comment. |

**Discussion:**

1. It is not clear what the commenter means by asking “Can the STA transmit PPDU in any channel?” For the channel bonding/aggregation scenarios, the channels that will be used to transmit PPDUs are already determined by the primary, secondary, secondary1 and secondary2 channels.

**Proposed resolution:** Rejected

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| CID | Clause | Comment | Proposed change |
| 3738 | 10.24.2.13 P187 L35 | "An EDMG STA that initiates a PPDU transmission to peer EDMG STA shall not set the TXVECTOR parameter CH\_BANDWIDTH of the PPDU to the channels in which the CCA were not idle according to Table 1"It is already covered by the bullets a-f. | Remove the cited wording. |

**Proposed resolution:** Rejected

1. Bullets a-f specify the “shall” behevior while this sentence specifies the “shall not” behaviour. While the comments is right in that the indicated sentence can be concluded by bullets a-f, it is still preferred to keep the sentence as an emphasis so that it is more explicit to understand that the behaviour described in the referred sentence is prohibited.

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| CID | Clause | Comment | Proposed change |
| 3739 | 10.24.2.13 P187 L6 | a) Transmit a 8.64 GHz mask PPDU if...b) Transmit a 4.32+4.32 GHz mask PPDU if...c) Transmit a 6.48 GHz mask PPDU if...d) Transmit a 4.32 GHz mask PPDU if...e) Transmit a 2.16+2.16 GHz mask PPDU if...The N GHz mask PPDUs are not defined. Please add the definitions in the clause 3.2. | As in comment. |

**Discussion:**

1. The correct way to resolve this CID is to replace all “x GHz mask PPDUs” with “x GHz PPDU”

**Proposed resolution:** Revised

*TGay editor to replace all “x GHz mask PPDUs” with “x GHz PPDU” related to this CID.*

**Straw Poll:**

* **Do you agree to accept comment resolutions as proposed in doc 11-18/1985r0?**