IEEE P802.11
Wireless LANs

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| LB190 resolution for comments on 10.2.1.4a |
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Abstract

This document proposes a resolution for CIDs 7205 and 7206 (comments on P802.11ac/D4.0).

Editing instructions based on P802.11ac/D4.0.

## Comments

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| **CID** | **Page** | **Line** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 7206 | 174.38 | 38 | 10.2.1.4a | This section should describe when and how the VHT TXOP Power Save field in the VHT Capabilities element is set for both a STA and an AP. | Describe when and how the VHT TXOP Power Save field is set | REVISED. Editor to change the draft as shown in 12/1384r1 under Proposed Change |
| 7205 | 174.35 | 35 | 10.2.1.4a | This section deals specifically with VHT TXOP power save, not power management during VHT transmissions | Change the subclause title to "VHT TXOP power save". | REVISED. Change subclause title to “VHT TXOP power save” and make it the last subclause of 10.2.1 |

## Discussion

There is nothing on 10.2.1.4a that ties VHT TXOP power save operation to the setting of the VHT TXOP Power Save field in the VHT Capabilities element.

The title of the subclause is a little too broad since it deals specifically with VHT TXOP power save operation. Also, note the context within the baseline:

10.2.1 Power management in a non-DMG infrastructure network

10.2.1.1 General

10.2.1.2 STA Power Management modes

10.2.1.3 AP TIM transmissions

10.2.1.4 TIM types

10.2.1.4a Power management during VHT transmission

10.2.1.5 Power management with APSD

10.2.1.6 AP operation during the CP

10.2.1.7 AP operation during the CFP

10.2.1.8 Receive operation for STAs in PS mode during the CP

10.2.1.9 Receive operation for STAs in PS mode during the CFP

10.2.1.10 Receive operation using APSD

10.2.1.11 STAs operating in the Active mode

10.2.1.12 AP aging function

10.2.1.13 PSMP power management

10.2.1.14 TDLS Peer Power Save Mode

10.2.1.15 TDLS Peer U-APSD

10.2.1.16 FMS power management

10.2.1.17 TIM broadcast

10.2.1.18 WNM-Sleep

To improve contextual relationship with other power save options, this subclause should move to the end of 10.2.1.

## Proposed Change

10.2.1.19 VHT TXOP power save

A VHT AP supports the operation of non-AP VHT STAs in TXOP power save mode in a BSS when the dot11VHTTXOPPowerSaveOptionImplemented at the AP is true. Non-AP VHT STAs that are in Active mode (see Table 10-1 (Power Management modes)) and have dot11VHTTXOPPowerSaveOptionImplemented equal to true operate in TXOP power save mode. A STA that has dot11VHTTXOPPowerSaveOptionImplemented equal to true shall set the VHT TXOP Power Save field in the VHT Capabilities element to 1; otherwise the STA shall set the field to 0. A VHT AP may allow non-AP VHT STAs in TXOP power save mode to enter the Doze state during a TXOP. A VHT AP shall indicate this by transmitting a VHT PPDU with the TXVECTOR parameter TXOP\_PS\_NOT\_ALLOWED set to 0. The value of this parameter in the TXVECTOR of all VHT PPDUs  transmitted by the VHT AP may be changed from 1 to 0 during the TXOP to enable TXOP PS for the remainder of the TXOP. The value of this parameter in the TXVECTOR of all VHT PPDUs transmitted by VHT AP shall not be changed from 0 to 1 during the TXOP. If the dot11VHTTXOPPowerSaveOptionImplemented at VHT AP is false then the VHT AP shall set the TXOP\_PS\_NOT\_ALLOWED to 1 in the TXVECTOR of the frames with FORMAT VHT.

If the AP allows non-AP VHT STAs to enter Doze state during a TXOP, then a non-AP VHT STA that is in VHT TXOP power save mode may enter the Doze state till the end of that TXOP when one of the following conditions is met(#6805):

* On receipt of a VHT MU PPDU(#6329), the STA determines that it is not a member of the group indicated by the RXVECTOR parameter GROUP\_ID.
* On receipt of an SU PPDU, the STA determines that the RXVECTOR parameter PARTIAL\_AID is neither equal to 0 nor does it match the STA’s partial AID.
* The STA finds that the PARTIAL\_AID in the RXVECTOR matches its partial AID but the RA in the MAC header of the corresponding frame that is received correctly does not match the MAC address of the STA.
* The STA receives a frame with an RXVECTOR parameter NUM\_STS equal to 0, if it is a member of group indicated by RXVECTOR GROUP\_ID.
* In a received VHT NDP Announcement frame, the STA finds that the RXVECTOR parameter PARTIAL\_AID is 0 and the AID in the STA Info field is not its AID.
* The STA receives a frame intended for it with the More Data field equal to 0 and the Ack Policy subfield in the QoS Control field is equal to No Ack or sends an acknowledgement if Ack Policy subfield is not equal to No Ack.

The VHT AP shall include a NAV-set sequence (e.g., RTS/CTS) at the beginning of such a TXOP with the Duration/ID value set to the remainder of the TXOP duration. A VHT AP shall not transmit frames to a non-AP VHT STA that has been allowed to enter Doze state according to the conditions above for the remainder of the TXOP.

NOTE—A VHT AP does(#6775) not transmit VHT SU PPDUs in the current TXOP if the AP has already transmitted a VHT PPDU with the TXVECTOR parameter TXOP\_PS\_NOT\_ALLOWED set to 0 in the same TXOP and does not want the STAs that are in Awake state to enter the Doze state.

If a VHT AP truncates the TXOP in which it allowed STAs to enter Doze state, then the VHT AP shall not transmit frames to the STAs that were allowed to enter the Doze state until the NAV set at the start of the TXOP has expired.

If the AP does not receive an acknowledgment after transmitting an individually addressed frame containing all or part of an MSDU, A-MSDU or MMPDU sent with the More Data field equal to 0 to a non-AP VHT STA that is in VHT TXOP power save mode and the AP had set the TXVECTOR parameter TXOP\_PS\_NOT\_ALLOWED to 0, it shall retransmit that frame at least once within the same TXOP, subject to applicable retry or lifetime limit, TXOP limit and the rules on TXOP sharing (see 9.19.2.3a (Sharing an EDCA TXOP)). If an acknowledgment to the retransmission of this last frame in the same TXOP is not received, it may wait until the next TXOP to further retransmit that frame, subject to its applicable retry or lifetime limit.

NOTE—An AP that receives from a VHT STA in TXOP power save mode a BlockAck frame that is a response to an A-MPDU containing MPDUs with the More Data field equal to 0, cannot expect to receive a response to subsequent MPDUs retransmitted in the same TXOP because the VHT STA might be in the Doze state.(#6377)

A VHT STA that is in TXOP power save mode and has entered Doze state shall continue to operate its NAV timer during Doze state and shall transition into Awake state on expiry of the NAV timer.

NOTE—The STA can contend for access to the medium immediately on the expiry of the NAV timer.(#6197)