IEEE P802.11  
Wireless LANs

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | Punctured NDP Comment Resolution | | | | | | Date: 2018-07-12 | | | | | | Author(s): | | | | | | Name | Affiliation | Address | Phone | email | | Ron Porat | Broadcom |  |  | [Ron.porat@broadcom.com](mailto:Ron.porat@broadcom.com) | | Lochan Verma | Qualcomm |  |  |  | | Jianhan Liu | Mediatek |  |  |  | | Hongyuan Zhang | Marvell |  |  |  | | Youhan Kim | Qualcomm |  |  |  | | Matt Fischer | Broadcom |  |  |  | | Zhou Lan | Broadcom |  |  |  | |  |  |  |  |  | |

Abstract

This submission proposes partial resolution (items 2 and 4) for comment 16723

From the letter ballot of TGax D3.0.

Changes relative to D3.0

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGax Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGax Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGax Editor: Editing instructions preceded by “TGax Editor” are instructions to the TGax editor to modify existing material in the TGax draft. As a result of adopting the changes, the TGax editor will execute the instructions rather than copy them to the TGax Draft.***

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| **CID** | **Commenter** | **Clause** | **Page/Line** | **Comment** | **Proposed Change** | **Resolution** |
| 16723 | Ron Porat | 28.3.16 | 547.53 | preamble puncturing as currently defined in D3.0 is lacking several features needed to make it useful especially in Radar channels when some subchannels are blocked for very long durations | Please consider adding the following enhancements: 1. Broadcast message to declare punctured subchannels 2. Punctured NDP to enable BF and DL MU-MIMO 3. NDPA signaling of punctured subbands in the NDP 4. Punctured Non-HT Dup to carry NDPA 5. New PHY modes to enable single user transmission across the entire available punctured BW with at least 60MHz support and one mode for >80MHz (e.g. 120MHz) | Revised  Editor: Please make the changes shown in document 11-18-1258r0 |

Discussion

The proposed changes in this document are based on proposals in document 18/0477 for defining a punctured NDP and punctured Non-HT duplicate mode.

Editor: Changes are as follows:

Change 1: Please add the following section ‘28.3.16.1 Punctured NDP’ on page 547 line 53 with the following text:

The HE NDP PPDU as defined in section 28.3.16 may be punctured in tones whose indices correspond to 242-tone RUs. The definition of those 242 RU tone location is as defined for HE MU PPDUs of the same BW.

The ACTIVE\_SUBCHANNELS parameter of the TXVECTOR of the HE NDP PPDU shall be set to indicate the active subchannels.

The punctured tones in the 242 RU signalled in the TXVECTOR parameter ACTIVE\_SUBCHANNELS exactly match the location as defined in Table 28-8.

The preamble tones overlapping those 242 RU are punctured as well.

If an HE NDP PPDU is punctured then the preceding NDPA shall signal the location of the punctured 242 RU.

The center 26 RU is punctured if either one of the inner 242 RU on tones [-258:-17] or [17:258] is punctured.

Change 2: Please add the following section to 27.6.3 on page 309 line 22 with the following text:

If the NDP is punctured the HE Compressed beamforming report field in section 9.4.1.63 shall not be transmitted over 242RUs that were punctured in the preceding HE NDPA.

In non-TB Sounding: HE compressed beamforming and CQI frame transmitted over the largest contiguous BW including primary 20MHz channel and excluding any punctured 242RU.

In TB Sounding: HE compressed beamforming and CQI frame transmitted over RU assignment signaled in Trigger frame

Change 3: Please add the following section to 9.4.1.63 on page 122 line 7 with the following text:

If the NDP is punctured the calculation of the average SNRs in Table 9-76b shall not include tones that fall within the punctured 242 RUs as signalled in the preceding HE NDPA

Change 4: Please add to table 28-1 TXVECTOR and RXVECTOR:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Parameter | Condition | Value | TXVECTOR | RXVECTOR |
| ACTIVE\_SUBCHANNELS | FORMAT is HE\_SU, HE\_MU or NON\_HT\_MODULATION is NON\_HT\_DUP\_OFDM | An 8-bit bitmap indicating which subchannels are used by the PPDU, with the LSbit corresponding to the subchannel with the lowest frequency within the CH\_BANDWIDTH of the PPDU  The 8-bit bitmap can’t enable subchannels disallowed in CH\_BANDWIDTH | Y | Y |
|  | Otherwise | Not Present | N | N |

Change 5: Please add the following section ‘28.3.13.1 Punctured Non-HT duplicate transmission’ on page 543 line 28 with the following text:

For 80 MHz and 160 MHz punctured non-HT duplicate transmissions as indicated by the value of NON\_HT\_DUP\_OFDM in the NON\_HT\_MODULATION parameter of the TXVECTOR with a CH\_BANDWIDTH value of CBW80, CBW160, the Data field shall be as described in section **21.3.10.12 Non-HT duplicate transmission** with the exception that 20MHz subbands that correspond to bits with zeros in the TXVECTOR field ACTIVE\_SUBCHANNELS are omitted from the transmission

In a noncontiguous 80+80 MHz non-HT punctured duplicate transmission as indicated by the value of NON\_HT\_DUP\_OFDM in the NON\_HT\_MODULATION parameter of the TXVECTOR with a CH\_BANDWIDTH value of CBW80+80, data transmission in each frequency segment shall be as defined for an 80 MHz punctured non-HT duplicate transmission.

Change 6: Please add the following PHY capabilities B79 ‘Punctured HE Sounding Support’ in **Figure 9-589cl** and in **Table 9-262aa** with the following descriptions

|  |  |  |
| --- | --- | --- |
| Subfield | Definition | Encoding |
| Punctured HE Sounding Support | For an AP, indicates support of transmission of punctured NDP.  For a non-AP STA, indicates support for the reception of punctured NDP and for the reception of an NDPA that includes information for puncturing | Set to 1 if supported  Set to 0 if not supported |

Change 7: Please make the following change in blue in section 9.3.1.20

The TA field is set to the address of the STA transmitting the VHT/HE NDP Announcement frame or the bandwidth signaling TA of the STA transmitting the VHT/HE NDP Announcement frame. In a VHT/HE NDP Announcement frame transmitted by a VHT or HE STA in a non-HT or non-HT duplicate format and where the scrambling sequence carries the TXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT, the TA field is set to a bandwidth signaling TA. In a HE NDP Announcement frame transmitted by a HE STA in a punctured non-HT duplicated format, the scrambling sequence carries the TXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT and shall be set to the same value as CH\_BANDWIDTH.

Change 8: Please add the following line in section 28.3.16 page 547 line 41

The HE NDP PPDU has the following properties:

— Uses the HE SU PPDU format but without the Data field

Note: The definition of a punctured NDP in section 28.3.16.1 is limited to the NDP PPDU and HE SU PPDU shall not be punctured .

— Has a Packet Extension field that is 4 us in duration

Change 9: Please add the following lines in section 28.1:

Page 380 line 13: Punctured HE Sounding Support

Page 381 line 66: Punctured HE Sounding Support