IEEE P802.11
Wireless LANs

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|  Spec Text for 20 MHz channel access |
| Date: 2020-03-20 |
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Abstract

This submission proposes spec texts for 20 MHz channel access based on motions passed in 19/497.

Revisions:

* Rev 0: Initial version of the document.

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 TGbd Draft. This introduction is not part of the adopted material.

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

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

**Discussion:**

The following motions about 20 MHz channel access in 802.11bd have been passed in 19/497

An 11bd 20 MHz channel includes two contiguous 10 MHz channels.

20 MHz channel access shall use sensing and backoff procedure for both of 10 MHz channels.

20 MHz channel access shall use only one backoff counter.

The two contiguous 10 MHz channels shall use the same receive sensitivity level.

[ [4] Motion #43]

20 MHz channel access performs a backoff procedure based on the channel states of two contiguous 10 MHz channels.

• The backoff counter decreases when the two contiguous 10 MHz channels are idle

• Idle states are checked by TBD sensing methods (e.g., Packet detection, GI detection, energy detection)

• More details are TBD.

[ [4] Motion #44]

When channel busy is indicated in the secondary channel and the duration of channel use is not known (e.g., NAV, packet detection), channel state shall be determined to be idle for a TBD IFS (e.g., AIFS, EIFS) sensing period before it resumes the backoff procedure.”

[ [4] Motion #45]

Within a 20 MHz channel, one 10 MHz channel is OCB primary 10 MHz channel, another 10 MHz channel is OCB secondary 10 MHz channel.

The OCB primary 10 MHz channel is decided by upper layer.

[ [6] Motion #88]

20 MHz channel consists of two contiguous 10 MHz channel:

• In one 10 MHz channel (denoted as OCB primary channel), the channel sensing with PD and ED with NAV setting method shall be applied.

• When the OCB primary channel is sensed as channel busy, the backoff procedure on the OCB primary channel shall be same as the backoff procedure of 10 MHz transmission

[ [6] Motion #71]

When OCB secondary channel is sensed busy and the duration of channel busy is not known, after the channel state transitions from busy to idle, EIFS interval shall be used to detect if the channel remains idle before resuming the backoff procedure.

When OCB secondary channel is sensed busy and the duration of channel busy is known, after the channel state transitions from busy to idle, AIFS interval shall be used to detect if the channel remains idle before resuming the backoff procedure.

Note: STA is not required to decode the duration of channel busy on the OCB secondary channel.

[ [6] Motion #72]

The decision of whether the STA is allowed to use 10 MHz fallback mechanism, as specified in the baseline 802.11 specification, is indicated by the upper layer.

[ [6] Motion #73]

For 20 MHz operation, the minimum CCA sensitivity on the secondary 10 MHz channel shall be -85 dBm for NGV and legacy 802.11p PPDUs, and shall be -65 dBm for any other signal.

[ [6] Motion #74]

The spec text for these motions is proposed.

**Propose:**

**TGbd Editor: *add the following subclause 3.2 (Definitions specific to IEEE Std 802.11)*** *in page 12 of D0.2*

**3.2 Definitions specific to IEEE Std 802.11**

***Insert the following definitions maintaining alphabetical order:***

**outside the context of a basic service set (BSS) (OCB) primary channel:** A 10 MHz channel, which is designated by MLME primitives and/or MIB access, in which both a physical carrier sense (CS) and a virtual carrier sense (CS) are applied to determine the current state of use of the 10 MHz wireless medium (WM) for the transmission of 20 MHz next generation v2x (NGV) physical layer (PHY) protocol data unit (PPDU).

**outside the context of a basic service set (BSS) (OCB) secondary channel:** The 10 MHz channel adjacent to a outside the context of a basic service set(BSS) (OCB) primary channel that together form the 20 MHz channel for the transmission of 20 MHz next generation v2x (NGV) physical layer (PHY) protocol data unit (PPDU).

**TGbd Editor: *add the following subclause in clause 31.2 (Operation in 5.9 GHz band)***

**31.2.x Channel scanning and transmission methods for 20 MHz OCB transmission**

An NGV 20 MHz channel consists of two contiguous 10 MHz channels: OCB primary channel and OCB secondary channel.

An NGV STA transmitting a 20 MHz NGV PPDU shall decide the OCB primary channel which is designated by the upper layer in TBD primitives.

An NGV STA transmitting a 20 MHz NGV PPDU shall contend for the medium using EDCAF as defined in 10.2.3.2 (HCF contention based channel access (EDCA)) and 10.3 (DCF) based on the medium sensing results of two contiguous 10 MHz channels, OCB primary channel and OCB secondary channel in an NGV 20 MHz channel. An NGV STA performing 20 MHz channel access determines that the 20 MHz medium is idle only if both of OCB primary channel and OCB secondary channel are sensed as idle.

If the medium of the OCB primary channel is determined to be busy, an NGV STA shall perform the random backoff procedure as described in 10.3.4.3 (Backoff procedure for DCF) after the medium of the OCB primary channel remains idle for a period for AIFS from the end of the immediately preceding medium-busy event. If the medium is determined to be busy in the OCB secondary channel and the duration of channel busy is not known, an NGV STA performs the backoff procedure described in 10.3.4.3 (Backoff procedure for DCF) after the medium remains idle for a period of EIFS (10.3.2.3.7 (EIFS)) from the end of the immediately preceding medium-busy event. If the medium is determined to be busy in the OCB secondary channel and the duration of channel busy is known, an NGV STA performs the random backoff procedure described in 10.3.4.3 (Backoff procedure for DCF) after the medium remains idle for a period of AIFS from the end of the immediately preceding medium-busy event.

When an NGV STA transmitting a 20 MHz NGV PPDU performs the random backoff procedure, shall decrement a backoff counter once per interval of aSlotTime (a backoff slot) while the medium sensing results of the two contiguous 10 MHz channels are determined to be idle. If the medium status of either OCB primary channel or OCB secondary channel is determined to be busy at any time during a backoff slot, then the backoff counter shall not be decremented for that slot. If the medium of the OCB primary channel is determined to be busy, the backoff counter is next decremented after the medium has been determined to be idle for the duration of an AIFS plus aSlotTime. If the medium is determined to be busy in the OCB secondary channel and the duration of channel busy is not known, the backoff counter is next decremented after the medium has been determined to be idle for the duration of an EIFS plus aSlotTime. If the medium is determined to be busy in the OCB secondary channel and the duration of channel busy is known, the backoff counter is next decremented after the medium has been determined to be idle for the duration of an AIFS plus aSlotTime.

If an NGV STA is unable to transmit a 20 MHz NGV PPDU because the OCB secondary channel is sensed busy and upper layer allows the transmission of 10 MHz PPDU by TBD MLME promitives and/or MIB access during the medium access procedure for 20 MHz NGV PPDU transmission, it may transition to the medium access procdure to transmit a 10 MHz PPDU on the OCB primary channel.

**TGbd Editor: *add the following subclause in clause 32.3 (NGV PHY)***

**32.3.10.x CCA sensitivity**

**32.3.10.x.y CCA sensitivity in 20 MHz**

When the OCB primary channel is idle, an NGV STA shall indicate a {secondary} channel busy condition for any valid NGV signal or OFDM transmissions at a receive level greater than or equal to the minimum modulation and coding rate sensitivity of –85 dBm in the OCB secondary channel. The receiver indicates a {secondary} channel busy condition for any signal at or above –65 dBm in the OCB secondary channel.