IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Comment Resolutions for 11bd D0.3 PHY Service Interface Section | | | | |
| Date: 2020-05-18 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Bo Sun | ZTE | ZTE R&D center, #9 Wuxingduan, Xifeng Rd., Chang’an district, Xi’an, China | +86-29-68700944 | Sun.bo1@zte.com.cn |
| Zhiqiang Han | ZTE | ZTE R&D center, #9 Wuxingduan, Xifeng Rd., Chang’an district, Xi’an, China |  | [Han.zhiqiang1@zte.com.cn](mailto:Han.zhiqiang1@zte.com.cn) |
|  |  |  |  |  |

Abstract

This submission provisions with resolutions to the following 5 CIDs related to PHY Service Interface of IEEE P802.11bd D0.3 (unapproved), including suggested spec text modification to IEEE P802.11bd D0.30 to TGbd editor:

* CIDs: 247, 128, 254, 359, 360

Revisions:

* R0, comment resolutions initial draft.
* R1, update based on discussion in TC on Aug 14th, 2020

Interpretation of a Motion to Adopt

A motion or majority supported straw poll to approve this submission means that the editing instructions and any changed or added material are actioned in the TGbd Draft. When the baseline spec draft is an unapproved version, a majority supported straw poll to approve this submission means that the editing instructions and any changed or added material are actioned in the unapproved 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.***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Pg/Ln** | **Clause** | **Comment** | **Proposed Changed** | **Resolution** |
| 247 | 27.09 | 32.2.2 | NON\_HT\_MODULATION parameter should be defined in the Table 32-1. Figure 32-1 and Figure 32-2 should be updated with this modification. And coresponding subclause should be added. Subclause L-SIG includes the concept of a non-HT duplicate PPDU. | as in comment | **Revised**  **Discussion:**  Since NGV supports both 10 MHz and 20 MHz operation, a non-HT duplicate PPDU could be helpful in access control and protection, as Liwen suggested, “RTS/CTS exchange can improve the throughput by avoiding the collision of long data PPDU. We should keep the duplicate 10MHz 11p PPDUs for RTS/CTS. The responding Ack/BA solicited by 20MHz PPDU should also be in duplicate 10MHz 11p PPDUs to avoid EIFS recovery”. Therefore the author of this CR agrees with the commenter that 11bd should support duplicate Non-NGV PPDU operation.  **TGbd Editor:**  Please implement the proposed spec text modification as part of resolution to CID 247 as in document 11-20/0790r1. |
| 128 | 29.43 | 32.2.2 | The "APEP\_LENGTH" and "PSDU\_LENGTH" are missing in Table 32-1. | Add entires for "APEP\_LENGTH" and "PSDU\_LENGTH". | **Revised**  **Discussion:**  Agree on the comment. Refer to consensus in the 11bd spec framework document (11-19/0497r6):  “*11bd enables both A-MSDU and A-MPDU operation to work for unicast OCB and not to exceed the constraints on A-MSDU in A-MPDU as defined in 802.11ac.*  *[ [4] Motion #36*]”  PSDU\_LENGTH is used for MAC to calculate padding and APEP\_LENGTH is used by PHY to construct PPDU.  **TGbd Editor:**  Please implement the proposed spec text modification as part of resolution to CID 128 as in document 11-20/0790r1. |

*---------------------------****Proposed Spec Text Modifications for CID 247****----------------------------------*

***TGbd Editor: please implement following modification to sub-clause 17.2 (OFDM PHY specific service parameter list) in latest IEEE P802.11revmd as proposed below as part of resolution to CID 247.***

**17.2 OFDM PHY specific service parameter list**

……

17.2.2 TXVECTOR parameters

17.2.2.1 General

…

**Table 17-1 – TXVECTOR parameters**

|  |  |  |
| --- | --- | --- |
| Parameter | Associated primitive | Value |
| … | … | … |
| CH\_BANDWIDTH\_IN\_NON\_NGV | PHY-TXSTART.request(TXVECTOR) | If present, CBW10 or CBW20 |
| DYN\_BANDWIDTH\_IN\_NON\_NGV | PHY-TXSTART.request(TXVECTOR) | If present, Static or Dynamic |

……

17.2.2.9 TXVECTOR CH\_BANDWIDTH\_IN\_NON\_NGV

If present, the allowed values for CH\_BANDWIDTH\_IN\_NON\_HT are CBW10 and CBW20. If present, this parameter is used to modify the first 7 bits of the scrambling sequence to indicate the bandwidth of the non-NGV duplicate PPDU.

NOTE—The CH\_BANDWIDTH\_IN\_NON\_NGV parameter is not present when the frame is transmitted by a non-NGV STA. The CH\_BANDWIDTH\_IN\_NON\_NGV parameter is not present when the frame is transmitted by a NGV STA to a non-NGV STA. See 10.6.12 (Channel Width in non-HT and non-HT duplicate PPDUs).

17.2.2.10 TXVECTOR DYN\_BANDWIDTH\_IN\_NON\_NGV

If present, the allowed values for DYN\_BANDWIDTH\_IN\_NON\_NGV are Static and Dynamic. If present, this parameter is used to modify the first 7 bits of the scrambling sequence to indicate if the transmitter is capable of Static or Dynamic bandwidth operation. If DYN\_BANDWIDTH\_IN\_NON\_NGV is present, then CH\_BANDWIDTH\_IN\_NON\_NGV is also present.

NOTE—The DYN\_BANDWIDTH\_IN\_NON\_NGV parameter is not present when the frame is transmitted by a non-NGV STA. The DYN\_BANDWIDTH\_IN\_NON\_NGV parameter is not present when the frame is transmitted by an NGV STA to a non-NGV STA. See 10.6.12 (Channel Width in non-HT and non-HT duplicate PPDUs).

17.2.3 RXVECTOR parameters

17.2.3.1 General

…

**Table 17-2 – RXVECTOR parameters**

|  |  |  |
| --- | --- | --- |
| Parameter | Associated primitive | Value |
| … | … | … |
| CH\_BANDWIDTH\_IN\_NON\_NGV | PHY-RXSTART.request(RXVECTOR) | If present, CBW10 or CBW20 |
| DYN\_BANDWIDTH\_IN\_NON\_NGV | PHY-RXSTART.request(RXVECTOR) | If present, Static or Dynamic |

……

17.2.3.9 RXVECTOR CH\_BANDWIDTH\_IN\_NON\_NGV

If present, the allowed values for CH\_BANDWIDTH\_IN\_NON\_HT are CBW10 and CBW20. If present and valid, this parameter indicates the bandwidth of the non-NGV duplicate PPDU. This parameter is used by the MAC only when valid (see 10.3.2.9 (CTS and DMG CTS procedure) and 10.6.6.6 (Channel Width selection for Control frames)).

NOTE—The CH\_BANDWIDTH\_IN\_NON\_NGV parameter is not present when the frame is received by a non-NGV STA (see 10.6.12 (Channel Width in non-HT and non-HT duplicate PPDUs)).

17.2.2.10 RXVECTOR DYN\_BANDWIDTH\_IN\_NON\_NGV

If present, the allowed values for DYN\_BANDWIDTH\_IN\_NON\_NGV are Static and Dynamic. If present and valid, this parameter indicates whether the transmitter is capable of Static or Dynamic bandwidth operation. This parameter is used by the MAC only when valid (see 10.3.2.9 (CTS and DMG CTS procedure) and 10.6.6.6 (Channel Width selection for Control frames)). If DYN\_BANDWIDTH\_IN\_NON\_NGV is present, then CH\_BANDWIDTH\_IN\_NON\_NGV is also present.

NOTE—The DYN\_BANDWIDTH\_IN\_NON\_NGV parameter is not present when the frame is received by a non-NGV STA (see 10.6.12 (Channel Width in non-HT and non-HT duplicate PPDUs)).

17.3 OFDM PHY

……

17.3.2 PPDU format

……

17.3.2.2 Overview of the PPDU encoding process

……

e) If the TXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT ~~is~~ and CH\_BANDWIDTH\_IN\_NON\_NGV are not present, initiate the scrambler with a pseudorandom nonzero seed and generate a scrambling sequence. If the TXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT or CH\_BANDWIDTH\_IN\_NON\_NGV is present, construct the first 7 bits of the scrambling sequence from CH\_BANDWIDTH\_IN\_NON\_HT or CH\_BANDWIDTH\_IN\_NON\_NGV, DYN\_BANDWIDTH\_IN\_NON\_HT (if present) or DYN\_BANDWIDTH\_IN\_NON\_NGV, and a pseudorandom integer constrained such that the first 7 bits of the scrambling sequence are not all 0s; then set the scrambler state to these 7 bits and generate the remainder of the scrambling sequence. XOR the scrambling sequence with the extended string of data bits. Refer to 17.3.5.5 (PHY DATA scrambler and descrambler) for details.

……

17.3.5 DATA field

……

17.3.5.5 PHY DATA scrambler and descrambler

……

TGbd Editor: please update Figure 17-7 by replacing “During bits 0-6 of Scrambling Sequence when CH\_BANDWIDTH\_IN\_NON\_HT is present” with “During bits 0-6 of Scrambling Sequence when CH\_BANDWIDTH\_IN\_NON\_HT or CH\_BANDWIDTH\_IN\_NON\_NGV is present”

……

The same scrambler is used to scramble transmit data and to descramble receive data. If the TXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT is and CH\_BANDWIDTH\_IN\_NON\_NGV are not present, when transmitting, the initial state of the scrambler shall be set to a pseudorandom nonzero state. If the TXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT or CH\_BANDWIDTH\_IN\_NON\_NGV is present,

— The first 7 bits of the scrambling sequence shall be set as shown in Table 17-7 (Contents of the first 7 bits of the scrambling sequence) (with field values defined in Table 17-8 (TXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT values) , Table 17-8a (TXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_NGV values), ~~and~~ Table 17-10 (DYN\_BANDWIDTH\_IN\_NON\_HT values) and Table 17-10a (DYN\_BANDWIDTH\_IN\_NON\_NGV values) and shall be also used to initialize the state of the scrambler

— The scrambler with this initialization shall generate the remainder (i.e., after the first 7 bits) of the scrambling sequence as shown in Figure 17-7 (Data scrambler)

— CH\_BANDWIDTH\_IN\_NON\_HT ~~is~~ and CH\_BANDWIDTH\_IN\_NON\_NGV are transmitted LSB first. For example, if CBW80 has a value of 2, which is 10 in binary representation, then B5=0 and B6=1

(#4027)If the TXVECTOR parameter SCRAMBLER\_RESET is set to RESET\_SCRAMBLER and dot11MACPrivacyActivated is true, the initial state of the scrambler shall be set to a nonzero random value not based on the scrambler value at the end of the last transmitted PPDU, before changes based on CH\_BANDWIDTH\_IN\_NON\_HT or CH\_BANDWIDTH\_IN\_NON\_NGV defined above are applied.

**Table 17-7 –Contents of the first 7 bits of the scrambling sequence**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **First 7 bits of scrambling sequence** | | |
| **B0 B3** | **B4**  **Transmit Order** | **B5 B6** |
| TXVECTOR | CH\_BANDWIDTH\_IN\_NON\_HT is present and DYN\_BANDWIDTH\_IN\_NOT\_HT is not present in TXVECTOR; or CH\_BANDWIDTH\_IN\_NON\_NGV is present and DYN\_BANDWIDTH\_IN\_NOT\_NGV is not present in TXVECTOR | 5-bit pseudorandom nonzero integer if CH\_BANDWIDTH\_IN\_NON\_HT (if present) equals CBW20 or CH\_BANDWIDTH\_IN\_NON\_NGV (if present) equals CBW10; and a 5-bit pseudorandom integer otherwise | | CH\_BANDWIDTH\_IN\_NON\_HT (if present) or CH\_BANDWIDTH\_IN\_NON\_NGV (if present) |
| TXVECTOR | CH\_BANDWIDTH\_IN\_NON\_HT is present and DYN\_BANDWIDTH\_IN\_NOT\_HT is present in TXVECTOR; or CH\_BANDWIDTH\_IN\_NON\_NGV is present and DYN\_BANDWIDTH\_IN\_NON\_NGV is present in TXVECTOR | 4-bit pseudorandom nonzero integer if CH\_BANDWIDTH\_IN\_NON\_HT (if present) equals CBW20 and DYN\_BANDWIDTH\_IN\_NON\_HT (if present) equals Static, or CH\_BANDWIDTH\_IN\_NON\_NGV (if present) equals CBW10 and DYN\_BANDWIDTH\_IN\_NON\_NGV (if present) equals Static; and a 4-bit pseudorandom integer otherwise | DYN\_BANDWIDTH\_IN\_NON\_HT (if present) or DYN\_BANDWIDTH\_IN\_NON\_NGV (if present) |
| RXVECTOR | CH\_BANDWIDTH\_IN\_NON\_HT and DYN\_BANDWIDTH\_IN\_NOT\_HT are present in RXVECTOR, or CH\_BANDWIDTH\_IN\_NON\_NGV and DYN\_BANDWIDTH\_IN\_NON\_NGV are present in RXVECTOR | - | DYN\_BANDWIDTH\_IN\_NON\_HT (if present), or DYN\_BANDWIDTH\_IN\_NON\_NGV (if present). | CH\_BANDWIDTH\_IN\_NON\_HT\_INDICATOR or CH\_BANDWIDTH\_IN\_NON\_NGV\_INDICATOR (see Table 17-9 (RXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT and CH\_BANDWIDTH\_IN\_NON\_NGV values)). |

……

Table 17-8a—TXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_NGV values

|  |  |
| --- | --- |
| Enumerated value | Value |
| CBW10 | 0 |
| CBW20 | 1 |

During reception by a VHT STA, RXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT shall be determined from selected bits in the scrambling sequence as shown in Table 17-7 (Contents of the first 7 bits of the scrambling sequence) and Table 17-9 (RXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT values). During reception by a VHT STA, the RXVECTOR parameter DYN\_BANDWIDTH\_IN\_NON\_HT shall be set to selected bits in the scrambling sequence as shown in Table 17-7 (Contents of the first 7 bits of the scrambling sequence). The fields shall be interpreted as being sent LSB-first.

During reception by a NGV STA, RXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_NGV shall be determined from selected bits in the scrambling sequence as shown in Table 17-7 (Contents of the first 7 bits of the scrambling sequence) and Table 17-9a (RXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_NGV values). During reception by a NGV STA, the RXVECTOR parameter DYN\_BANDWIDTH\_IN\_NON\_NGV shall be set to selected bits in the scrambling sequence as shown in Table 17-7 (Contents of the first 7 bits of the scrambling sequence). The fields shall be interpreted as being sent LSB-first.

……

**Table 17-9a—RXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_NGV values**

|  |  |
| --- | --- |
| **CH\_BANDWIDTH\_IN\_NON\_NGV\_INDICATOR field of first 7 bits of scrambling sequence** | **RXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT** |
| 0 | CBW10 |
| 1 | CBW20 |

……

**Table 17-10a—DYN\_BANDWIDTH\_IN\_NON\_NGV values**

|  |  |
| --- | --- |
| **Enumerated value** | **Value** |
| Static | 0 |
| Dynamic | 1 |

NOTE 1—The receiving PHY cannot determine whether the CH\_BANDWIDTH\_IN\_NON\_HT, ~~and~~ DYN\_BANDWIDTH\_IN\_NON\_HT, CH\_BANDWIDTH\_IN\_NON\_NGV and DYN\_BANDWIDTH\_IN\_NON\_NGV parameters were present in the TXVECTOR of the transmitting PHY; therefore, the receiving PHY in a VHT STA always includes values for the CH\_BANDWIDTH\_IN\_NON\_HT and DYN\_BANDWIDTH\_IN\_NON\_HT parameters in the RXVECTOR if the (#1355)PPDU is a non-HT PPDU; the receiving PHY in an NGV STA always includes values for the CH\_BANDWIDTH\_IN\_NON\_NGV and DYN\_BANDWIDTH\_IN\_NON\_NGV parameters in the RXVECTOR if the PPDU is a non-NGV PPDU. It is the responsibility of the MAC to determine the validity of the RXVECTOR parameters CH\_BANDWIDTH\_IN\_NON\_HT, ~~and~~ DYN\_BANDWIDTH\_IN\_NON\_HT, CH\_BANDWIDTH\_IN\_NON\_NGV and DYN\_BANDWIDTH\_IN\_NON\_NGV.

NOTE 2—The receiving PHY cannot determine whether the TXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT or CH\_BANDWIDTH\_IN\_NON\_NGV was present, but it does not matter since descrambling the DATA field is the same either way. The seven LSBs of the SERVICE field shall be set to all 0s prior to scrambling to enable estimation of the initial state of the scrambler in the receiver. An example of the scrambler output is illustrated in I.1.5.2 (Scrambling the BCC example) with CH\_BANDWIDTH\_IN\_NON\_HT not present.

*---------------------------****Proposed Spec Text Modifications for CID 247/128****---------------------------------*

***TGbd Editor: please implement following modification to Table 32-1 (TXVECTOR and RXVECTOR parameters) in sub-clause 32.2.2 (TXVECTOR and RXVECTOR) in IEEE P802.11bd D0.3 as proposed below as part of resolution to CID 247/128.***

**Table 32-1 -- TXVECTOR and RXVECTOR parameters**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Condition** | **Value** | **TXVECTOR** | **RXVECTOR** |
| FORMAT |  | Determines the format of the PPDU.  Enumerated type:  NON\_NGV\_10 indicates Clause 17 PPDU format for 10 MHz channel spacing or Non-NGV duplicate PPDU format. *[CID# 247]*  NGV indicates NGV PPDU format as defined in Clause 32.d |  |  |
| NON\_NGV\_MODULATION | FORMAT is NON\_NGV\_10 | In TXVECTOR, indicates the format of the transmitted Non-NGV PPDU.  In RXVECTOR, indicates the estimated format of the received Non-NGV PPDU.  Enumerated type:  OFDM indicates Clause 17 (Orthogonal frequency division multiplexing (OFDM) PHY specification) format;  NON\_NGV\_10\_DUP\_OFDM indicates Non-NGV duplicate PPDU format. | Y | Y |
| Otherwise | Not present *[CID# 247]* | N | N |
| ... | ... | ... | ... |  |
| APEP\_LENGTH | FORMAT is NGV | Indicates the number of octets in the range 0 to 1 048 575 in the A-MPDU pre-EOF padding (see 10.13.2 (A-MPDU length limit rules)) carried in the PSDU. | Y | N |
| Otherwise | Not present *[CID# 128]* | N | N |
| PSDU\_LENGTH | FORMAT is NGV | Indicates the number of octets in the range 0 to aPSDUMaxLength octets (see Table 32-xx (NGV PHY characteristics)) in the NGV PSDU. | N | Y |
| Otherwise | Not present*[CID# 128]* | N | N |
|  | …… |  |  |  |
| DYN\_BANDWIDTH\_IN\_NON\_NGV | FORMAT is NON\_NGV\_10 | In TXVECTOR, if present, indicates whether the transmitter is capable of Static or Dynamic bandwidth operation.  In RXVECTOR, if valid, indicates whether the transmitter is capable of Static or Dynamic bandwidth operation.  Enumerated type:  Static if the transmitter is capable of Static bandwidth operation  Dynamic if the transmitter is capable of Dynamic bandwidth operation  NOTE—In the RXVECTOR, the validity of this parameter is determined by the MAC based on the contents of the received MPDU. | O | Y |
| Otherwise | Not present*[CID# 247]* | N | N |
| CH\_BANDWIDTH\_IN\_NON\_NGV | FORMAT is NON\_NGV\_10 | In TXVECTOR, if present, indicates the channel width of the transmitted PPDU, which is signaled via the scrambling sequence.  In RXVECTOR, if valid, indicates the channel width of the received PPDU, which is signaled via the scrambling sequence.  Enumerated type:  CBW10, CBW20  NOTE—In the RXVECTOR, the validity of this parameter is determined by the MAC based on the contents of the currently received MPDU (e.g., RTS) or the previous MPDU in an exchange (e.g., the RTS preceding a CTS). | O | Y |
| Otherwise | Not present*[CID# 247]* | N | N |
|  | …… |  |  |  |
| NOTE 1—In the “TXVECTOR” and “RXVECTOR” columns, the following apply:  Y = Present;  N = Not present;  O = Optional; | | | | |

……

***TGbd Editor: please implement the modification to sub-clause 32.3.4 (Effects of CH\_BANDWIDTH parameter on PPDU format) and Table 32-2 in IEEE P802.11bd D0.3 as proposed below as part of resolution to CID 247.***

**32.2.4 Effects of CH\_BANDWIDTH parameter on PPDU format**

Table 32-2 (Interpretation of FORMAT, NON\_NGV\_MODULATION and CH\_BANDWIDTH parameters) shows the valid combinations of the FORMAT, NON\_NGV\_MODULATION and CH\_BANDWIDTH parameters and the corresponding PPDU format.

**Table 32-2— Interpretation of FORMAT, NON\_NGV\_MODULATION and CH\_BANDWIDTH parameters**

|  |  |  |  |
| --- | --- | --- | --- |
| **FORMAT** | **NON\_NGV\_MODULATION** | **CH\_BANDWIDTH** | **PPDU format** |
| NGV | N/A | CBW10 | The STA transmits an NGV PPDU(when FORMAT is NGV) of 10MHz bandwidth. |
| NGV | N/A | CBW20 | The STA transmits an NGV PPDU of 20 MHz bandwidth. |
| NON\_NGV\_10 | OFDM | CBW10 | The STA transmits a non-NGV PPDU of 10 MHz bandwidth. |
| NON\_NGV\_10 | NON\_NGV\_10\_DUP\_OFDM | CBW20 | The STA transmits a NON\_NGV\_10 PPDU with NON\_NGV\_MODULATION set to NON\_NGV\_10\_DUP\_OFDM using two adjacent 10 MHz channels as defined in 32.3.8.11 (Non-NGV duplicate transmission). The one 10 MHz channel higher in frequency is rotated +90º relative to the 10 MHz channel lowest in frequency as defined in Equation (32-5). |

***TGbd Editor: please replace Figure 32-1 and Figure 32-2 in IEEE P802.11bd D0.3 with following alternatives. as part of resolution to CID 247.***

32.2.5 Support for NON\_NGV format

…

C:\Users\10193214\Desktop\Figures1.emf

**Figure 32-1—PHY interaction on transmit for various PPDU formats**

C:\Users\10193214\Desktop\Figures2.emf

**Figure 32-2—PHY interaction on receive for various PPDU formats**

*[CID# 247]*

……

***TGbd Editor: please add sub-clause 32.3.8.11 (Non-NGV duplicate transmission) into IEEE P802.11bd D0.3 as proposed below as part of resolution to CID 247.***

32.3.8.11 Non-NGV duplicate transmission

When the TXVECTOR parameter FORMAT is NON\_NGV\_10 and the TXVECTOR parameter NON\_NGV\_MODULATION is NON\_NGV\_10\_DUP\_OFDM, the transmitted PPDU is a non-NGV duplicate. Non-NGV duplicate transmission is used to transmit to STAs that support non-NGV OFDM and may be present in a part of a 20 MHz channel (see Table 32-2 (Interpretation of FORMAT, NON\_NGV\_MODULATION, CH\_BANDWIDTH, and CH\_OFFSET parameters)). The RL-SIG, NGV-SIG, RNGV-SIG, NGV-STF and NGV-LTF fields are not transmitted. The L-STF, L-LTF, and L-SIG fields shall be transmitted in the same way as in the NGV transmission, with the exceptions for the Rate and Length fields which shall follow 17.3.4 (SIGNAL field).

*[CID# 247]*

***TGbd Editor: please add sub-clause 32.4.4 (NGV PHY) into IEEE P802.11bd D0.3 as proposed below as part of resolution to CID 128.***

**32.4.4 NGV PHY***[CID# 128]*

The static NGV PHY characteristics, provided through the PLME-CHARACTERISTICS service primitive, shall be as shown in Table 17-21 (OFDM PHY characteristics) with 10 MHz channel spacing unless otherwise listed in Table 32-xx (NGV PHY characteristics). The definitions for these characteristics are given in 6.5.4 (PLME-CHARACTERISTICS.confirm).

Table 32-xx -- NGV PHY characteristics

|  |  |
| --- | --- |
| Characteristics | Value |
| aSlotTime | If dot11OperatingClassesRequired is false, 13 µs  If dot11OperatingClassesRequired is true, 13 µs plus any coverage-class-dependent aAirPropagationTime (see Table 9-97 (Coverage Class field parameters)) |
| aCCAMidTime | 45 µs |
| aPPDUMaxTime | 5.484 ms |
| aPSDUMaxLength | 121 320 octets (see NOTE 1) |
| aRxPHYStartDelay | 64 µs (see NOTE 2) |
| NOTE 1—This is the maximum length in octets for a NGV PPDU with a bandwidth of 20 MHz, NGV-MCS 9, and 2 spatial streams, and limited by 674 possible data symbols in aPPDUMaxTime. This is the maximum PSDU length an NGV PHY could support assuming no restrictions in MAC. See 10.3.2 (Procedures common to the DCF and EDCAF) and 9.2.4.7.1 (General) for additional restrictions on the maximum number of octets the MAC could support.  NOTE 2—This value arises from the time to the end of RNGV-SIG (see Figure 32-4 (NGV PPDU format)). | |

-------------------- ***End of proposed changes for resolution to CID 247/128*** *--------------------------*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Pg/Ln** | **Clause** | **Comment** | **Proposed Changed** | **Resolution** |
| 359 | 66.54 | 32.4.1 | fill TBD | as in comment | **Revised**  **Discussion:**  Agree in principle.  **TGbd Editor:**  Please implement the proposed spec text modification as part of resolution to CID 359 as in document 11-20/0790r0. |

*---------------------------****Proposed Spec Text Modifications for CID 359****----------------------------------*

***TGbd Editor: please update sub-clause 32.4.1 (PLME-SAP) in IEEE P802.11bd D0.3 as proposed below as part of resolution to CID 359.***

**32.4.1 PLME-SAP**

~~<TBD>~~

Table 32-xx (NGV PHY MIB attributes) lists the MIB attributes that may be accessed by the PHY entities and

the intralayer of higher level LMEs. These attributes are accessed via the PLME-GET, PLME-SET, PLME-

RESET, and PLME-CHARACTERISTICS primitives defined in 6.5 (PLME SAP interface).

Table 32-xx—NGV PHY MIB attributes

|  |  |  |
| --- | --- | --- |
| Managed object | Default  value/range | Operational  semantics |
| dot11PHYOperationTable | | |
| dot11PHYType | ngv | Static |
| dot11PHYTxPowerTable | | |
| dot11NumberSupportedPowerLevelsImplemented | Implementation  dependent | Static |
| dot11TxPowerLevel1 | Implementation  dependent | Static |
| dot11TxPowerLevel2 | Implementation  dependent | Static |
| dot11TxPowerLevel3 | Implementation  dependent | Static |
| dot11TxPowerLevel4 | Implementation  dependent | Static |
| dot11TxPowerLevel5 | Implementation  dependent | Static |
| dot11TxPowerLevel6 | Implementation  dependent | Static |
| dot11TxPowerLevel7 | Implementation  dependent | Static |
| dot11TxPowerLevel8 | Implementation  dependent | Static |
| dot11CurrentTxPowerLevel | Implementation  dependent | Static |
| dot11TxPowerLevelExtended | Implementation  dependent | Static |
| dot11CurrentTxPowerLevelExtended | Implementation  dependent | Static |
| dot11PHYNGVTable | | |
| dot11CurrentChannelWidth | Implementation  dependent | Dynamic |
| dot11CurrentPrimaryChannel | Implementation  dependent | Dynamic |
| dot11CurrentSecondaryChannel | Implementation  dependent | Dynamic |
| dot11NGVDCMImplemented | Implementation  dependent | Static |
| dot11NGVMidambleRxMaxNSS | Implementation  dependent | Static |
| dot11NGVDYN20MAllowed | Implementation  dependent | Static |

……

……

-------------------- ***End of proposed changes for resolution to CID 359*** *---------------------*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Pg/Ln** | **Clause** | **Comment** | **Proposed Changed** | **Resolution** |
| 254 | 29.60 | 32.2.3 | dot11CurrentChannelWidth should be defined in 32.3 (PHY MIB) with NGV PHY MIB attributes | make a table called NGV PHY MIB attributes and define it | **Revised**  **Discussion:**  Agree in principle.  **TGbd Editor:**  Please implement the proposed spec text modification as part of resolution to CID 254 as in document 11-20/0790r0. |
| 360 | 66.59 | 32.4.2 | fill TBD | as in comment | **Revised**  **Discussion:**  Agree in principle.  **TGbd Editor:**  Please implement the proposed spec text modification as part of resolution to CID 360 as in document 11-20/0790r0. |

*---------------------------****Proposed Spec Text Modifications for CID 254/360****---------------------------------*

***TGbd Editor: please update sub-clause 32.4.2 (PHY MIB) in IEEE P802.11bd D0.3 as proposed below as part of resolution to CID 254/360 respectively.***

**32.4.2 PHY MIB**

~~<TBD>~~

NGV PHY MIB attributes are defined in Annex C with specific values defined in Table 32-xx (NGV PHY MIB attributes). The “Operational semantics” column in Table 32-xx (NGV PHY MIB attributes) contains two types: static and dynamic.

— Static MIB attributes are fixed and cannot be modified for a given PHY implementation.

— Dynamic MIB attributes are interpreted according to the MAX-ACCESS field of the MIB attribute.

When MAX-ACCESS is read-only, the MIB attribute value may be updated by the PLME and read from the MIB attribute by management entities. When MAX-ACCESS is read-write, the MIB attribute may be read and written by management entities but shall not be updated by the PLME.

-------------------- ***End of proposed changes for resolution to CID 254/360*** *---------------------*

**References:**

1. **IEEE P802.11bd/D0.3, Apr 2020.**