IEEE P802.11  
Wireless LANs

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| CR for 11be D4.0 TxRx Procedure and Miscs. | | | | |
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Abstract

This submission proposes text changes of TGbe Draft 4.0 for CIDs:

19015

19016

19089

19094

19110

19157

19158

19168

19371

19374

19399

19539

19540

19541

19542

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 TGbe Draft 4.0. This introduction is not part of the adopted material.

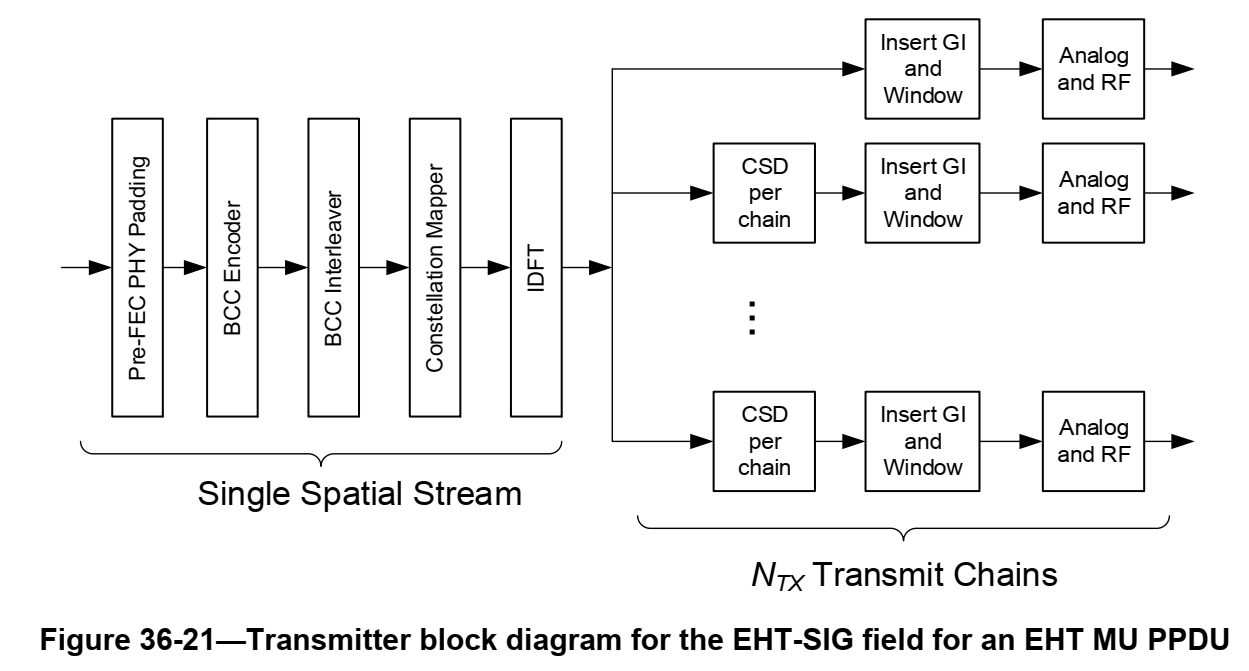
***Editing instructions formatted like this are intended to be copied into the TGbe Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

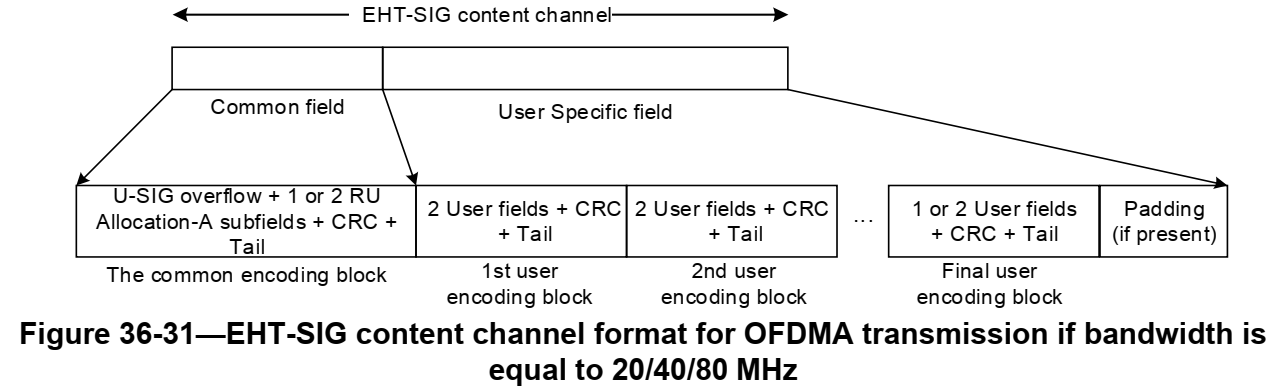
***TGbe Editor: Editing instructions preceded by “TGbe Editor” are instructions to the TGbe editor to modify existing material in the TGbe draft. As a result of adopting the changes, the TGbe editor will execute the instructions rather than copy them to the TGbe Draft.***

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| --- | --- | --- | --- | --- | --- |
| **CID** | **Clause** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 19015 | 36.3.13.3.6 | 801.25 | n' is not defined | remove the ' | Rejected  The commenter misread the comma as prime. |
| 19016 | 36.3.13.3.6 | 800.01 | "Padding bits are appended immediately after the tail bits corresponding to the final user encoding block in each EHT-SIG content channel to round up to the next multiple of number of data bits per EHT-SIG OFDM symbol. The padding bits may be set to any value. Further padding bits are appended to each EHT-SIG content channel so that the number of OFDM symbols after encoding and modulation in different 20 MHz subchannels is the same and equal to the number of EHT-SIG symbols signaled in the Number Of EHT-SIG Symbol subfield in U-SIG field. For the common encoding block and each user encoding block, the information bits, tail bits and padding bits (if present) are BCC encoded at rate using the encoder described in 17.3.5.6 (Convolutional encoder)" sounds like there are preFEC and postFEC padding. | if the intention is to do both prefec and postfec, it's better to explicitly describe. However, it's not necessary IMO. | Revised.  11be editor please make changes under CID 19016 in DCN 23/1491r3 |
| 19089 | 36.3.6 | 725.45 | The pre-FEC phy padding doesn't match the descriptions on padding in EHT-SIG subclause | Clarify on either side and align both | Revised.  11be editor please make changes under CID 19089 in DCN 23/1491r3 |
| 19094 | 36.3.23 | 896.11 | there are two dots. 'The PHY entity shall not process the Disregard field..' | remove one dot. | Accepted |
| 19110 | 36.3.23 | 896.11 | Periods are duplicated at the end of this sentence. | Please delete one of them. | Accepted |
| 19157 | 36.3.21.6.3 | 888.31 | Wrong reference "aCCATime (see 21.4.4 (VHT PHY))" | Point to the correct subclause | Revised.  Note to commenter - Please note that 36.4.4 points back to Table 19-25 which defines aCCATime.  11be editor please change the reference in the concerned sentence from 21.4.4(VHT PHY) to  36.4.4 (EHT PHY). |
| 19158 | 36.3.21.6.4 | 889.14 | OBSS\_PD is only present in the per20MHz CCA. However, in the SR subclause "The value of the OBSS\_PDlevel is applicable to the start of a 20 MHz PPDU received on the primary 20 MHz channel." OBSSPD is applicable to P20 but no matched text in CCA. In addition, start of PPDU is usually refered as PD but "The received signal strength level, which is measured from the L-STF or L-LTF fields of the PPDU or the PHY SYNC field, shortSYNC field or Long PHY SYNC field, whichever exists and which is used to determine PHY-CCA.indication, is below the SRG OBSS PD level." This is energy detection. Thirdly, why an energy detection needs aCCAMid time instead of aCCATime? | There are a few mismatch between CCA and OBSS\_PD based SR. Let's discuss how to fix it... | Rejected  “The CCA signal shall be held busy (not issue a PHY-CCA.indication primitive with the STATUS parameter set to IDLE) for the duration of the PPDU, unless it receives a CCARESET.request primitive before the end of the PPDU for instance during spatial reuse operation as described in 35.10 (EHT Spatial reuse operation).” This sentence should address the concern. |
| 19168 |  | 862.39 | there seems to be an extra 'hows' in the following sentence: "Figure 36-63 (Example transmit spectral mask for a 320 MHz mask PPDU) shows hows an example of the resulting overall spectral mask when the -40 dBr spectrum level is above -39 dBm/MHz" | remove 'hows' between 'shows' and 'an example' as follows:  "Figure 36-63 (Example transmit spectral mask for a 320 MHz mask PPDU) shows an example of the resulting overall spectral mask when the -40 dBr spectrum level is above -39 dBm/MHz" | Accepted |
| 19371 | 36.3.23 | 896.59 | "may" undermines the entire RX procedure. While there continues to be a valid PPDU that could be intended for the receiver, the receiver \*shall\* continue to receive it. Otherwise the receiver could use this exception to selectively ignore any frame in an EHT MU PPDU that the receiver doesn't like by pointing to this gaping exception. This is a repeat of CID 17625 which was rejected for the reason "The current specification has clarified the behaviour of receiving UL PPDU." which is non-responsive to this "may" issue. | Append something along the lines of "If the STA-ID field is checked and equals the intended STA-ID or if the STA\_ID field is not checked, the receiver shall continue receiving the EHT-STF right after the EHT-SIG" | Revised.  11be editor please make changes under CID 19371 in DCN 23/1491r4 |
| 19374 | 36.3.23 | 899.25 | A very short non-HT/HT/VHT/etc PPDU cannot be an 11be PPDU because the 11be preamble is just too long. SIG rotations (e.g., Q-BPSK) and repetitions (e.g., RLSIG) are probabistic determinations which are usually conducted by comparing a statistic to a threshold, and such determinations have some non-zero probability of performing a false detection. This is an update to CID 17632 which was rejected with a rich explanation (many thanks) which however included some flaws: - "(1) Once Rx evaluates LENGTH, the parity and RATE check are passed. The RL-SIG is detected, and the received signal can only be HE or EHT. Non-HT is impossible." is untrue with additive noise etc. There is always a non-zero false detection rate. Shall's should not be included to preclude better implementations: e.g. one that entertains multiple PPDU format hypotheses and eliminates a hypothesis only when it becomes impossible to proceed. - "(2) A long-enough LENGTH and a short-enough LENGTH can't be used to distinguish between 11a and 11be. Because in addition to 11a, other PPDU format may have ultra short length which is shorter than the shortest EHT PPDU. E.g. 11n may have 5 symbols (SIG(2 sym)+STF/LTF/Data(3sym)) after L-SIG, which is shorter than shortest EHT (RL-SIG+U-SIG(2sym)+EHT-SIG(1sym)+STF/LTF). Similar for 11ac." - true. Accordingly this comment is updated. And actually the rejeciton reason underlines the value and importance of considering length to constrain the PPDU format determination. - 3) " Implementation is free to implement such algorithm but including in spec is not necessary." - so we agree that the spec language should not preclude such an implementation (which is what I see at L42-46) | During PPDU format determination, add LSIG LENGTH as an (optional) consideration for excluding a PPDU format from the set of remaining candidate PPDU formats; and thence allowing hte RX procedure to jump to the associated 11a/HT/VHT/etc RX procedure when the candidate set has been reduced to the PPDU format(s) defined in a single PHY clause. | Revised.  11be editor please make changes under CID 19374 in DCN 23/1491r4 |
| 19399 | 36.3.6 | 730.13 | This figure 36-26 is related to the RU or MRU size larger than a 996-tone RU. Thus, there should exist two, three or four 80 MHz subblocks. However, only 2 subblocks are shown here. Three or four output branches could be added to the output of the segment parser. | As in comment. Can add "..." to the output of the segment parser. | Rejected.  There are dots in the graph. The squares overlaying each other will take care the case of more than two segments. |
| 19539 | 36.3.20.1.2 | 864.04 | "Case 1" is not descriptive as a header. | Replace with "Case 1: "preamble puncturing at the edge of the EHT PPDU bandwidth" | Accepted |
| 19540 | 36.3.20.1.2 | 865.35 | "Case 2" is not descriptive as a header. | Replace with "Case 2: "preamble puncturing of two or more contiguous 20 MHz subchannels not at the edge of the EHT PPDU bandwidth" | Accepted |
| 19541 | 36.3.20.1.2 | 864.04 | "Case 3" is not descriptive as a header. | Replace with "Case 3: "preamble puncturing of single 20 MHz subchannel not at the edge of the EHT PPDU bandwidth" | Accepted |
| 19542 | 36.3.20.1.2 | 871.01 | "The rules of constructing (...) is the same as the rules defined in 36.3.20.1.2 (...)". Verb should be plural. | Change to "The rules of constructing (...) are the same as the rules defined in 36.3.20.1.2 (...)" | Accepted |

**Discussions on CID 19016, CID 19089:**

"Padding bits are appended immediately after the tail bits corresponding to the final user encoding block in  
each EHT-SIG content channel to round up to the next multiple of number of data bits per EHT-SIG OFDM  
symbol.  
The padding bits may be set to any value. Further padding bits are appended to each EHT-SIG content  
channel so that the number of OFDM symbols after encoding and modulation in different 20 MHz  
subchannels is the same and equal to the number of EHT-SIG symbols signaled in the Number Of EHT-SIG Symbol subfield in U-SIG field. For the common encoding block and each user encoding block, the  
information bits, tail bits and padding bits (if present) are BCC encoded at rate using the encoder  
described in 17.3.5.6 (Convolutional encoder)"





Discussions: The current text describe EHT-SIG padding as two portion of padding but it’s not clearly saying pre-FEC or post-FEC. The two portions reads like include both pre-FEC and post FEC. The current block diagram of EHT-SIG only mentioned pre-FEC. EHT-SIG coding graph only say “padding (if present)”. Although there is no performance difference for BCC regardless of pre or post FEC padding is conducted, it may cause confusion in different understanding and leads to different implementations and consequence could be calibration error. **The suggestion is to clearly saying those padding are pre-FEC padding.**

**Proposed changes for CID 19016, CID 19089:**

*11be editor please make the following changes in P.L. 800.1 (36.3.12.8.6 Encoding and modulation).*

Pre-FEC padding bits are appended immediately after the tail bits corresponding to the final user encoding block in each EHT-SIG content channel to round up to the next multiple of number of data bits per EHT-SIG OFDM symbol.

The padding bits may be set to any value. Further Pre-FEC padding bits are appended to each EHT-SIG content channel so that the number of OFDM symbols after encoding and modulation in different 20 MHz  
subchannels is the same and equal to the number of EHT-SIG symbols signaled in the Number Of EHT-SIG Symbol subfield in U-SIG field. For the common encoding block and each user encoding block, the  
information bits, tail bits and padding bits (if present) are BCC encoded at rate using the encoder  
described in 17.3.5.6 (Convolutional encoder)

**Proposed changes for CID 19371**

***11be editor, please replace the paragraph of P.L. 896.56 highlighted as red with the following paragraph marked as brown***

~~If the UL/DL subfield of the U-SIG field is set to 1 and the CRC protecting the common encoding block of the EHT-SIG is valid and an unsupported mode or a Validate EHT-SIG indication is not indicated, the PHY entity may continue receiving the EHT-STF after the EHT-SIG without checking the STA-ID subfield.~~

If the receiving PHY entity is contained in an AP, the UL/DL subfield of the U-SIG field is set to 1, the value of the BSS Color subfield matches a value in the PHYCONFIG VECTOR parameter BSS\_COLOR\_LIST, the CRC protecting the common encoding block of the EHT-SIG is valid and an unsupported mode or a Validate EHT-SIG indication is not indicated, the PHY entity may check the STA-ID in the User field.

— If the PHY entity checks the STA-ID in the User field and the STA-ID value matches the 11 LSBs of the AID of a STA in the AP’s BSS, then the PHY shall continue receiving the EHT-STF after the EHT-SIG.

— If the PHY entity does not check the STA-ID in the User field, then the PHY shall continue receiving the EHT-STF after the EHT-SIG.

**Proposed changes for CID 19374**

***11be editor, please change P.L. 894.55 as following***

If the detected format indicates a non-HT PPDU, refer to the receive procedure and state machine in Clause 15 (DSSS PHY specification for the 2.4 GHz band designated for ISM applications), Clause 16 (High rate direct sequence spread spectrum (HR/DSSS) PHY specification), Clause 17 (Orthogonal frequency division multiplexing (OFDM) PHY specification), and Clause 18 (Extended Rate PHY (ERP) specification). If the detected format indicates an HT PPDU format, refer to the receive procedure and state

machine in Clause 19 (High Throughput (HT) PHY specification). If the detected format indicates a VHT PPDU format, refer to the receive procedure and state machine in Clause 21 (Very High Throughput (VHT) PHY specification). If the detected format indicates an HE PPDU format, refer to the receive procedure and state machine in Clause 27 (High Efficiency (HE) PHY specification). Furthermore, while a particular format has not been excluded, the corresponding receive procedure may operate such that multiple receive procedures operate in parallel until a single format is indicated and a single receive procedure is operating. Through station management (via the PLME), the PHY is set to the appropriate frequency as specified in 36.4 (EHT PLME). The PHY has also …

***11be editor, please change P.L. 895.24 as following***

After the PHY-CCA.indication(BUSY, channel-list) primitive is issued, the PHY entity shall begin receiving the training symbols and searching for L-SIG in order to set the maximum duration of the data stream. Then the PHY will search for the preambles for non-HT, HT-MF, VHT, HE, and EHT PPDUs~~, respectively~~. If the constellation used in the first symbol after the first long training field is QBPSK, the PHY entity shall continue to detect the received signal using the receive procedure for HT-GF depicted in Clause 19 (High

Throughput (HT) PHY specification). For detecting the EHT preamble, the PHY entity shall search for RL-SIG and evaluate the LENGTH field. If RL-SIG is detected, the PHY entity should check the parity bit and RATE fields in L-SIG and RL-SIG. If either the check of the parity bit is invalid or the RATE field is not set to 6 Mb/s, neither a PHY-RXEARLYSIG.indication nor a PHY-RXSTART.indication primitive is issued.

If the check of the parity bit is valid and the RATE field indicates 6 Mb/s but the LENGTH field value in L-SIG is a not a multiple of three, neither a PHY-RXEARLYSIG.indication nor a PHY-RXSTART.indication primitive is issued. A PHY entity may determine from L-SIG that EHT PPDU format is excluded via other means, in which case neither a PHY-RXEARLYSIG.indication nor a PHY-RXSTART.indication primitive is issued.

If the EHT preamble is not detected, the PHY should continue to detect the received signal using non-HT, HT, VHT, and HE receive procedure in Clause 17 (Orthogonal frequency division multiplexing (OFDM) PHY specification), Clause 19 (High Throughput (HT) PHY specification), Clause 21 (Very High Throughput (VHT) PHY specification), and Clause 27 (High Efficiency (HE) PHY specification), respectively.