IEEE P802.11  
Wireless LANs

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | Proposed Draft Text Overview of the PPDU encoding process | | | | | | Date: 2020-08-25 | | | | | | Author(s): | | | | | | Name | Affiliation | Address | Phone | email | | Youhan Kim | Qualcomm |  |  | youhank@qti.qualcomm.com | |

Abstract

This document contains proposed draft text for overview of the PPDU encoding process.

**Revision History:**

R0: Initial version.

R1: Changed clause 33 to 34.

34.X1.Y1 Overview of the PPDU encoding process

34.X1.Y1.1 General

This subclause provides an overview of the EHT PPDU encoding process.

34.X1.Y1.2 Construction of L-STF

Construct the L-STF field as defined in 34.X2 (L-STF) with the following highlights:

* Determine the channel bandwidth from the TXVECTOR parameter CH\_BANDWIDTH.
* Sequence generation: Generate the L-STF sequence over the channel bandwidth as described in 34.X2 (L-STF).
* Phase rotation: Apply appropriate phase rotation for each 20 MHz subchannel as described in 34.X3 (Mathematical description of signals) and 34.X4 (Definition of tone rotation).
* IDFT: Compute the inverse discrete Fourier transform.
* CSD per chain: Apply CSD per chain for each transmit chain and frequency segment as described in 34.X5 (Cyclic shift for pre-EHT modulated fields).
* Insert GI and apply windowing: Prepend a GI (*TGI,*Pre-EHT) and apply windowing as described in 34.X3 (Mathematical description of signals).
* Analog and RF: Upconvert the resulting complex baseband waveform associated with each transmit chain to an RF signal according to the center frequency of the desired channel and transmit. Refer to 34.X3 (Mathematical description of signals) and 34.X6 (EHT preamble) for details.

34.X1.Y1.3 Construction of L-LTF

Construct the L-LTF field as defined in 34.X7 (L-LTF) with the following highlights:

* Determine the channel bandwidth from the TXVECTOR parameter CH\_BANDWIDTH.
* Sequence generation: Generate the L-LTF sequence over the channel bandwidth as described in 34.X7 (L-LTF).
* Phase rotation: Apply appropriate phase rotation for each 20 MHz subchannel as described in 34.X3 (Mathematical description of signals) and 34.X4 (Definition of tone rotation).
* IDFT: Compute the inverse discrete Fourier transform.
* CSD per chain: Apply CSD per chain for each transmit chain and frequency segment as described 34.X5 (Cyclic shift for pre-EHT modulated fields).
* Insert GI and apply windowing: Prepend a GI (*TGI*,L-LTF) and apply windowing as described in 34.X3 (Mathematical description of signals).
* Analog and RF: Upconvert the resulting complex baseband waveform associated with each transmit chain to an RF signal according to the carrier frequency of the desired channel and transmit. Refer to 34.X3 (Mathematical description of signals) and 34.X6 (EHT preamble) for details.

34.X1.Y1.4 Construction of L-SIG

Construct the L-SIG field as the SIGNAL field defined in 34.X8 (L-SIG) with the following highlights:

* Set the RATE subfield in the SIGNAL field to 6 Mb/s. Set the LENGTH, Parity, and Tail fields in the SIGNAL field as described in 34.X8 (L-SIG).
* BCC encoder: Encode the SIGNAL field by a convolutional encoder at the rate of *R* = 1/2 as described in 34.X9 (BCC coding and puncturing).
* BCC interleaver: Interleave as described in 17.3.5.7 (BCC interleavers).
* Constellation Mapper: BPSK modulate as described in 34.X10 (Constellation mapping).
* Pilot insertion: Insert pilots as described in 34.X8 (L-SIG).
* Extra subcarrier insertion: Four extra subcarriers are inserted at  for channel estimation purpose and the values on these four extra subcarriers are {–1, –1, –1, 1}, respectively.
* Duplication and phase rotation: Duplicate the L-SIG field over each occupied 20 MHz subchannel of the channel bandwidth. Apply appropriate phase rotation for each occupied 20 MHz subchannel as described in 34.X3 (Mathematical description of signals) and 34.X4 (Definition of tone rotation).
* IDFT: Compute the inverse discrete Fourier transform.
* CSD per chain: Apply CSD per chain for each transmit chain and frequency segment as described in 34.X5 (Cyclic shift for pre-EHT modulated fields).
* Insert GI and apply windowing: Prepend a GI (*TGI*,Pre-EHT) and apply windowing as described in 34.X3 (Mathematical description of signals).
* Analog and RF: Upconvert the resulting complex baseband waveform associated with each transmit chain. Refer to 34.X3 (Mathematical description of signals) and 34.X6 (EHT preamble) for details.

34.X1.Y1.5 Construction of RL-SIG

Construct the RL-SIG field as the repeat SIGNAL field defined in 34.X11 (RL-SIG) with the following highlights:

* Set the RATE subfield in the repeat SIGNAL field to 6 Mb/s. Set the LENGTH Parity, and Tail fields in the repeat SIGNAL field as described in 34.X11 (RL-SIG).
* BCC encoder: Encode the repeat SIGNAL field by a convolutional encoder at the rate of *R* = 1/2 as described in 34.X9 (BCC coding and puncturing).
* BCC interleaver: Interleave as described in 17.3.5.7 (BCC interleavers).
* Constellation Mapper: BPSK modulate as described in 34.X10 (Constellation mapping).
* Pilot insertion: Insert pilots as described in 34.X11 (RL-SIG).
* Extra subcarrier insertion: Four extra subcarriers are inserted at  for channel estimation purpose and the values on these four extra subcarriers are {–1, –1, –1, 1}, respectively.
* Duplication and phase rotation: Duplicate the RL-SIG field over each occupied 20 MHz subchannel of the channel bandwidth. Apply appropriate phase rotation for each occupied 20 MHz subchannel as described in 34.X3 (Mathematical description of signals) and 34.X4 (Definition of tone rotation).
* IDFT: Compute the inverse discrete Fourier transform.
* CSD per chain: Apply CSD per chain for each transmit chain and frequency segment as described in 34.X5 (Cyclic shift for pre-EHT modulated fields).
* Insert GI and apply windowing: Prepend a GI (*TGI*,Pre-EHT) and apply windowing as described in 34.X3 (Mathematical description of signals).
* Analog and RF: Upconvert the resulting complex baseband waveform associated with each transmit chain. Refer to 34.X3 (Mathematical description of signals) and 34.X6 (EHT preamble) for details.

34.X1.Y1.6 Construction of U-SIG

TBD

34.X1.Y1.7 Construction of EHT-SIG

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34.X1.Y1.8 Construction of EHT-STF

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34.X1.Y1.9 Construction of EHT-LTF

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34.X1.Y1.10 Construction of the Data field in an EHT PPDU

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