IEEE P802.11  
 Wireless LANs

|  |
| --- |
| **Proposed TGbd draft specification**  **PHY receiver procedure** |
| **Date:** 2019-11-10 |
| **Author(s):** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Affiliation** | **Address** | **Phone** | **Email** |
| Yujin Noh | Newracom |  |  | yujin.noh at newracom.com |
| Si-Chan Noh | Newratek |  |  | sc.noh at newratek.com |
|  |  |  |  |  |

Abstract

This document contains a proposal for the TGbd draft amendment. It captures the feature requirements outlined in the TGbd specification framework document (11-19/0497) in detailed draft text.

# Next Generation V2X (NGV) PHY specification

## Intorduction

## NGV PPDU format

## Transmitter block diagram

## Overview of the PPDU encoding process

## NGV modulatin and coding schemes

## Timing related parameters

## Mathematical description of signals

## NGV Preamble

## Data field

## Transmit specification

## Receiver specification

## NGV transmit procedure

## NGV receive procedure

A typical PHY receive procedure is shown in Figure 33-x1 (PHY receive procedure for NGV transmission) for NGV format. A typical state machine implementation of the receive PHY is given in Figure 33-x2 (PHY receive state machine). This receive procedure and state machine do not describe the operation of optional features, such as TBD. If the detected format indicates a NON\_NGV PPDU, refer to the receive procedure and state machine in Clause 17 (Orthogonal frequency division multiplexing (OFDM) PHY specification). Further, through station management (via TBD) the PHY is set to the appropriate frequency, as specified in 33.xx (TBD). Receive parameters, such as RSSI and indicated DATARATE, may be accessed via the PHY SAP.

Upon receiving the transmitted PHY preamble in a greater than or equal to 10 MHz channel, the PHY measures a receive signal strength. This activity is indicated by the PHY to the MAC via a PHY-CCA.indication primitive. A PHY-CCA.indication(BUSY, channel-list) primitive is also issued as an initial indication of reception of a signal as specified in 33.xx (CCA sensitivity). The channel-list parameter of the PHY-CCA.indication primitive is absent when the operating channel width is 10 MHz. The channel-list parameter is present when the operating channel width is 20 MHz.

The PHY shall not issue a PHY-RXSTART.indication primitive in response to a PPDU that does not overlap the 10 MHz channel (TBD).



Figure 33-x1—PHY receive procedure for NGV transmission

The PHY includes the most recently measured RSSI value in the PHY-RXSTART.indication(RXVECTOR) primitive issued to the MAC.

After the PHY-CCA.indication(BUSY, channel-list) primitive is issued, the PHY entity shall begin receiving the training symbols and searching for the preambles for NON-NGV and NGV PPDUs, respectively. For detecting the NGV preamble, the PHY entity shall search for L-SIG and RL-SIG in order to set the maximum duration of the data stream. 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 3 Mb/s, a PHY-RXSTART.indication primitive is not issued, and instead the PHY shall issue the error condition PHY-RXEND.indication(FormatViolation) primitive. If a valid parity bit and the RATE with 3 Mb/s are indicated in L-SIG and RL-SIG and the LENGTH field value in L-SIG and RL-SIG meets the TBD condition, the NGV PHY shall maintain PHY-CCA.indication(BUSY, channel-list) primitive for the predicted duration of the transmitted PPDU, as defined by TBD, for all supported modes, and TBD. If NGV-SIG indicates TBD, the PHY shall issue a PHY-RXEND.indication(TBD).primitive.

After receiving a valid L-SIG, RL-SIG, NGV-SIG and RNGV-SIG indicating a supported mode, the PHY entity shall begin receiving the NGV training symbols.

The PHY optionally filters out the PPDU based on TBD.

If the PPDU is filtered out, the PHY shall issues a PHY-RXEND.indication(Filtered).primitive.

Following training fields, the Data field shall be received. The number of symbols in the Data field is determind by TBD.

If signal loss occurs during reception prior to completion of the PSDU reception, the error condition shall be reported to the MAC using a PHY-RXEND.indication(CarrierLost) primitive. After waiting for the intended end of the PSDU as determined by TBD, the PHY shall generate a PHY-CCA.indication(IDLE) primitive and return to RX IDLE state.

The received PSDU bits are assembled into octets, decoded, and presented to the MAC using a series of PHY-DATA.indication(DATA) primitive exchanges. Any final bits that cannot be assembled into a complete octet are considered pad bits and discarded. After the reception of the final bit of the last PSDU octet, and possible padding and tail bits(TBD), the receiver shall be returned to the RX IDLE state, as shown in Figure 33-xx (PHY receive state machine). A PHY-RXEND.indication(NoError) primitive shall be issued on entry to the RX IDLE state.

TBD

Figure 33-x2—PHY receive state machine

## Regulatory requirements