IEEE P802.11  
Wireless LANs

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | CC35 TXVECTOR, RXVECTOR | | | | | | Date: 2021-09-22 | | | | | | Author(s): | | | | | | Name | Affiliation | Address | Phone | email | | Youhan Kim | Qualcomm |  |  | [youhank@qti.qualcomm.com](mailto:youhank@qti.qualcomm.com) | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |

Abstract

This submission proposes resolutions for the following comments from comment collection on P802.11-REVme D0.0:

12

NOTE – Set the Track Changes Viewing Option in the MS Word to “All Markup” to clearly see the proposed text edits.

**Revision History:**

R0: Initial version.

R1: Editiorial changes.

* “TXVECTOR and RXVECTOR parameters … is defined” 🡪 “TXVECTOR and RXVECTOR parameters … are defined” 2x
* Added VHT to “TXVECTOR and RXVECTOR parameters for transmitting or receiving a DSSS, HR/DSSS, OFDM, ERP or HT PPDU” in 27.2.2

# CID 12

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| **CID** | **Clause** | **Page.Line** | **Comment** | **Proposed Change** |
| 12 | 21.2.2 | 3111.47 | In VHT and HE PHY, we defined TXVECTOR/RXVECTOR parameters table in a duplication way which includes parameters that will not be present in specific PHY. Such design will accumulate more and more redundant parameters of no no use but increasing the complexity of the table and spec pages. | Update table 21-1 and improve the TXVECTOR/RXVECTOR table for 11ax to remove redundant and meaningless parameters. Keep parameters that only make sense to the specific PHY layer. |

**Discussion**

TXVECTOR and RXVECTOR are used by PHY to exchange information w/ MAC on a per PPDU basis. Each generation of PHY requires different set to TX/RXVECTOR parameters, and the list is growing quite large as the PHYs are becoming more complex.

Note that many of the TX/RXVECTOR parameters listed in VHT and HE PHYs are not used for VHT or HE PPDUs, respectively. Rather, they just take up space in the VHT/HE PHY TX/RXVECTOR tables and just states that it is not used by VHT/HE PHY. For example, following is from the VHT TX/RXVECTOR Table 21-1:

REVme D0.1 P3301:

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The VHT TX/RXVECTOR table (Table 21-1) is 9 pages long and has 31 parameters, out of which 11 parameters are not used by VHT PPDUs.

The HE TX/RXVECTOR table (Table 27-1) is 17 pages long and has 66 parameters, out of which 11 parameters are not used by HE PPDUs.

The reason for the TX/RXVECTOR parameters having all the parameters of the previous generations is because there is only one PHY conceptually. E.g., while a VHT STA also supports OFDM and HT PPDUs, the VHT STA has only the VHT PHY. Hence, the MAC uses the VHT TX/RXVECTOR to transmit/receive OFDM and HT PPDUs as well. This document does not intend to change that behavior. However, that does not mean that the VHT TX/RXVECTOR “table” has to list all TX/RXVECTOR ‘parameters’ for all PPDU types (OFDM, HT and VHT). Rather, the VHT TX/RXVECTOR “table” could simply list the parameters required to transmit/receive VHT PPDUs, and refer to the OFDM or HT TX/RXVECTORs for transmitting/receiving OFDM or HT PPDUs, respectively. Remember that we need to refer to the OFDM and HT ‘clauses’ anyway to describe the OFDM and HT PPDU waveform generation anyway. Besides, all we are saying for the OFDM/HT parameters in the VHT TX/RXVECTOR table is to say that “this is not used for VHT”, which is not a useful information in practice.

For example, if a VHT STA’s is MAC trying to transmit an HT PPDU, the MAC currently sends a TXVECTOR including parameters defined by Table 19-1 (HT TXVECTOR). I.e., the TXVECTOR would not contain VHT specific parameters such as USER\_POSITION (used for DL MU-MIMO transmission which is not supported by HT PHY). All that the VHT PHY currently checks is the FORMAT parameter. If the FORMAT parameter is VHT, then it would expect the remaining TXVECTOR parameters to be as specified in Table 21-1 (VHT TXVECTOR). But if the FORMAT parameter indicated HT, then the PHY would stop looking at Table 21-1 further. Rather Table 19-1 (HT TXVECTOR) would be used instead. Hence, again, there is no need to list out HT specific TX/RXVECTOR parameters (and unused by VHT) in a VHT TX/RXVECTOR table. It is just a waste of paper or disk space.

If the group truly wishes to include all TX/RXVECTOR parameters of ‘previous’ PHYs (e.g. include all OFDM, HT and VHT TX/RXVECTOR parameters in HE TX/RXVECTOR table), then there are a lot of parameters missing currently. For example, the following HT TX/RXVECTOR parameters are missing from Table 27-1 (HE TX/RXVECTOR) on a quick glance:

1. LSIGINVALID
2. SERVICE
3. SMOOTHING
4. SOUNDING
5. AGGREGATION
6. NUM\_EXTEN\_SS
7. ANTENNA\_SET
8. EXPANSION\_MAT\_TYPE
9. CHAN\_MAT\_TYPE

As this was done at a quick glance, it is highly possible that I missed some. Also, there are VHT TX/RXVECTOR parameters missing from HE TX/RXVECTOR table. And as we progress to ‘future’ PHYs (e.g. 11be and beyond), the requirement to carry all previous PHY TX/RXVECTOR parameters will be too much overhead.

Hence, the proposal is to remove any TX/RXVECTOR parameters that are not used by ‘that’ PHY from the respective TX/RXVECTOR parameter table.

There is also opinion that the ‘names’ of the TX/RXVECTOR parameters of previous PHYs should still be listed at end of the TX/RXVECTOR table so that it is still ‘searchable’. For example, such proposal would look something like:

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| At the end of the ~17 pages long HE TX/RXVECTOR table, add a NOTE saying something like:  Following TX/RXVECTOR parameters are not used by an HE PPDU, but are need to transmit or receive OFDM, ERP, HT or VHT PPDUs:   * LSIGINVALID * SERVICE * SMOOTHING * SOUNDING * AGGREGATION * NUM\_EXTEN\_SS * ANTENNA\_SET * EXPANSION\_MAT\_TYPE * CHAN\_MAT\_TYPE * … |

However, I do not find such list useful because any reasonable reader should already understand that, for example, an HE STA supports transmiting DSSS, HR/DSSS, ERP, OFDM, HT and VHT PPDUs as well. And if the reader is interested in some TX/RXVECTOR parameter for, say, an HT PPDU, then the reader can simply look at the HT TX/RXVECTOR table. And such a list would still be quite long (without providing much information to the ‘current’ PHY), and that overhead will keep growing for each new generation of PHY developed in the future.

**Proposed Resolution: CID 12**

**Revised**.

**Note to Commenter:**

The proposed text update below removes TX/RXVECTOR parameters not used by the ‘current’ PHY.

**Instruction to Editor:**

Implement the proposed text updates for CID 12 in <https://mentor.ieee.org/802.11/dcn/21/11-21-1136-01-000m-cc35-txvector-rxvector.docx>

**Proposed Text Updates: CID 12**

21.2.2 TXVECTOR and RXVECTOR parameters

*Instruction to Editor: Update REVme D0.1 P3300L42 as shown below:*

The parameters in Table 21-1 are defined as part of the TXVECTOR parameter list in the PHY-TXSTART.request primitive and/or as part of the RXVECTOR parameter list in the PHY-RXSTART.indication primitive. TXVECTOR and RXVECTOR parameters for transmitting or receiving a DSSS, HR/DSSS, OFDM, ERP or HT PPDU are defined in:

* DSSS PPDU: Table 15-1 and Table 15-2
* HR/DSSS PPDU: Table 16-5
* OFDM PPDU: Table 17-1 and Table 17-2
* ERP PPDU: Table 18-1 and Table 18-3
* HT PPDU: Table 19-1

*Instruction to Editor: Delete the following rows from Table 21-1:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| * TXVECTOR and RXVECTOR parameters | | | | |
| Parameter | Condition | Value | TXVECTOR | RXVECTOR |
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27.2.2 TXVECTOR and RXVECTOR parameters

*Instruction to Editor: Update REVme D0.1 P3902L7 as shown below:*

The parameters in Table 27-1 (TXVECTOR and RXVECTOR parameters) are defined as part of the TXVECTOR parameter list in the PHY-TXSTART.request primitive and/or as part of the RXVECTOR parameter list in the PHY-RXSTART.indication primitive and PHY-RXEND.indication primitives. TXVECTOR and RXVECTOR parameters for transmitting or receiving a DSSS, HR/DSSS, OFDM, ERP, HT or VHT PPDU are defined in:

* DSSS PPDU: Table 15-1 and Table 15-2
* HR/DSSS PPDU: Table 16-5
* OFDM PPDU: Table 17-1 and Table 17-2
* ERP PPDU: Table 18-1 and Table 18-3
* HT PPDU: Table 19-1
* VHT PPDU: Table 21-1

*Instruction to Editor: Delete the following rows from Table 27-1:*

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| * TXVECTOR and RXVECTOR parameters(11ax) | | | | |
| Parameter | Condition | Value | TXVECTOR | RXVECTOR |
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