IEEE P802.11  
Wireless LANs

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | Steering Vector Sanctity Text | | | | | | Date: 2017-01-16 | | | | | | Author(s): | | | | | | Name | Affiliation | Address | Phone | email | | Matthew Fischer | Broadcom |  |  | [Matthew.fischer@broadcom.com](mailto:Matthew.fischer@broadcom.com) | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |

Abstract

This submission proposes a resolution to LB 225 CID 8100 which allows a beamformee to request that no changes be made by the beamformer to steering vector feedback information.

**REVISION NOTES:**

**R0**:

initial

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 TGax Draft. This introduction is not part of the adopted material.

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

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

**Proposed Changes**

***TGax editor: within TGax D1.0, add the following modifications within subclause 9.4.1.48 VHT MIMO Control field:***

**9.4.1.48 VHT MIMO Control field**

***Change Figure 9-117 as follows (change a reserved bit to Steering Vector Sanctity):***

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **B0 B2** | **B3 B5** | **B6 B7** | **B8 B9** | **B10** | **B11** | **B12 B14** | **B15** | **B16** | **~~B16~~ B17** | **B18 B23** |
|  | Nc Index | Nr Index | Channel Width | Grouping | Codebook Information | Feedback Type | Remaining Feedback Segments | First Feedback Segment | Steering Vector Sanctity | Reserved | Sounding Dialog Token Number |
| **Bits:** | 3 | 3 | 2 | 2 | 1 | 1 | 3 | 1 | 1 | ~~2~~1 | 6 |

**Figure 9-117 – VHT MIMO Control field**

***Change Table 9-66 as follows (add a new row):***

**Table 9-66 – Subfields of the VHT MIMO Control field**

|  |  |
| --- | --- |
| **Subfield** | **Description** |
| … | … |
| Steering Vector Sanctity | Indicates if the feedback steering vector is to be ualtered by the Beamformer for SU PPDU transmissions:  Set to 0 if the beamformer is not restricted to unaltered use of the feedback steering vector in SU PPDU transmissions to the STA corresponding to the TA of this feedback frame  Set to 1 if the beamformer is restricted to unaltered use of the feedback steering vector in SU PPDU transmissions to the STA corresponding to the TA of this feedback frame |
| … | … |

***TGax editor: within TGax D1.0, add the following modifications within subclause 9.4.1.628 HE MIMO Control field:***

**9.4.1.62 HE MIMO Control field**

***Change Figure 9-121a as follows (change a reserved bit to Steering Vector Sanctity):***

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **B0 B2** | **B3 B5** | **B6 B7** | **B8** | **B10** | **B11** | **B12 B14** | **B15** | **B16 B22** | **B23 B29** | **B30 B35** | **B36** | **~~B36~~B37 B39** |
|  | Nc Index | Nr Index | BW | Grouping | Codebook Information | Feedback Type | Remaining Feedback Segments | First Feedback Segment | RU Start Index | RU End Index | Sounding Dialog Token Number | Steering Vector Sanctity | Reserved |
| **Bits:** | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 7 | 7 | 6 | 1 | ~~4~~3 |

**Figure 9-121a – HE MIMO Control field**

***Change Table 9-76a as follows (add a new row):***

**Table 9-76a – HE MIMO Control field encoding**

|  |  |
| --- | --- |
| **Subfield** | **Description** |
| … | … |
| Steering Vector Sanctity | Defined in 9.1.4.48 (VHT MIMO Control field) |
| … | … |

**9.4.2.27 Extended Capabilities element**

***TGax editor: add a new row to Table 9-135 – Extended Capabilies field to TGax D1.0 as show, noting that the header row is shown only for convenience:***

|  |  |  |
| --- | --- | --- |
| **Bit** | **Information** | **Notes** |
| <ANA> | Steering Vector Sanctity Support | A STA sets the Steering Vector Sanctity Support field to 1 when dot11SteeringVectorSanctityActivated is true, and sets it to 0 otherwise. See 11.46a |

***TGax editor: modify subclause 10.34.5 “VH sounding protocol” in TGax D1.0 as shown:***

**10.34.5 VHT sounding protocol**

**10.34.5.1 General**

***TGax editor: insert the following text to appear immediately after the first paragraph of subclause 10.34.5.1 “General” in TGax D1.0:***

A VHT STA is Steering Vector Sanctity capable if it transmits an Extended Capability element with the Steering Vector Sanctity Support subfield with a value of 1. A VHT Beamformee shall set the Steering Vector Sanctity subfield to 0 in frames transmitted to a STA that is not Steering Vector Sanctity capable. If the Steering Vector Sanctity subfield of a received PPDU containing a VHT Compressed Beamforming Report field is equal to 1, then the VHT beamformer shall not alter the steering vector provided in the PPDU for beamformed SU PPDU transmissions to the STA that transmitted the PPDU, except to account for the difference in the transfer functions of the transmit filters used for the sounding exchange and the beamformed PPDU transmission and corrections to balance transmit power per antenna.

A Beamformer that is Steering Vector Sanctity capable shall use linear interpolation when creating the SU PPDU steering vector from the compressed steering vector information that is returned in a VHT Compressed Beamforming frame with the Steering Vector Sanctity subfield equal to 1.

***TGax editor: insert a paragraph as shown within subclause 10.34.5.2 “Rules for VHT sounding protocol sequences” in TGax D1.0:***

**10.34.5.2 Rules for VHT sounding protocol sequences**

A VHT beamformee that transmits VHT Compressed Beamforming feedback shall include neither the VHT Compressed Beamforming Report information and nor the MU Exclusive Beamforming Report information if the transmission duration of the PPDU carrying the VHT Compressed Beamforming Report information and any MU Exclusive Beamforming Report information would exceed the maximum PPDU duration.

A VHT beamformee that has transmitted a frame with the Steering Vector Sanctity subfield set to 1 to a Beamformer may transmit a feedback frame to the Beamformer that contains no VHT Compressed Beamforming Report field or MU Exclusive Beamforming Report field, for the purpose of communicating a Steering Vector Sanctity subfield value.

The value of the Sounding Dialog Token Number subfield in the VHT MIMO Control field shall be set to the same value as the Sounding Dialog Token Number subfield in the Sounding Dialog Token field in the corresponding VHT NDP Announcement frame.

***TGax editor: insert the following text at the end of 27.6.2 “Rules for HE sounding protocol sequences” in TGax D1.0:***

**27.6.2 Rules for HE sounding protocol sequences**

An HE STA is Steering Vector Sanctity capable if it transmits an Extended Capability element with the Steering Vector Sanctity Support subfield with a value of 1. An HE Beamformee shall set the Steering Vector Sanctity subfield to 0 in frames transmitted to a STA that is not Steering Vector Sanctity capable. If the Steering Vector Sanctity subfield of a received PPDU containing an HE Compressed Beamforming Report field is equal to 1, then the HE beamformer shall not alter the steering vector provided in the PPDU for beamformed SU PPDU transmissions to the STA that transmitted the PPDU, except to account for the difference in the transfer functions of the transmit filters used for the sounding exchange and the beamformed PPDU transmission and corrections to balance transmit power per antenna.

A Beamformer that is Steering Vector Sanctity capable shall use linear interpolation when creating the SU PPDU steering vector from the compressed steering vector information that is returned in an HE Compressed Beamforming frame with the Steering Vector Sanctity subfield equal to 1.

An HE beamformee that has transmitted a frame with the Steering Vector Sanctity subfield set to 1 to a Beamformer may transmit a feedback frame to the Beamformer that contains no HE Compressed Beamforming Report field or MU Exclusive Beamforming Report field, for the purpose of communicating a Steering Vector Sanctity subfield value.

**TGax Editor: *Add a new MIB variable in C.3 MIB Detail within the dot11StationConfigEntry group as shown:***

**C.3 MIB Detail**

dot11SteeringVectorSanctityActivated OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a capability variable. Its value is determined by device capabilities.

This attribute, when true, indicates that the STA implementation, when acting in the role of a transmit Beamformer, accepts requests to use an umodified feedback steering vector from a transmit Beamformee. The capability is disabled, otherwise"

DEFVAL { false }

::= { dot11StationConfigEntry <XX>}

**End of proposed changes.**