IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Draft 3.0 Typo Fix for SIG field LENGTH subfield definitions in Clause 24 sections | | | | |
| Date: 2015-01-06 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Eugene Baik | Qualcomm Inc. | 5775 Morehouse Dr, San Diego, CA 92109 |  | eugeneb@qca.qualcomm.com |

Abstract

This submission proposes fixes regarding typos defining the SIG field’s Length subfield definition in Clause 24 of TGah Draft 3.0, in the following Sections:

* Section 24.3.8.2.1.4 SIG definition
* Section 24.3.8.2.2.1.4 SIG-A definition
* Section 24.3.8.3.4 SIG definition

## Discussion:

From Draft 2.0 to Draft 3.0 of the TGah specification, a typo was introduced regarding the definition of the Length subfield of the SIG/SIG-A fields for the >=2MHz Short preamble, >=2MHz Long SU preamble, and 1MHz preambles.

In these 3 preamble types, the original design (and intention) was such that the LENGTH field be set to:

* The value of the PSDU\_LENGTH parameter (in bytes) in TXVECTOR when the Aggregation bit is set to 0
* N\_sym (number of symbols) when the Aggregation bit is set to 1.

However, from Draft 2.0 to Draft 3.0, the section was revised and a mistake was made in which the behavior for when the Aggregation bit = 0 and Aggregation bit = 1 were reversed.

The current text is inconsistent with the other defined behavior in Clause 24 and the opposite of the original intention and therefore should be corrected.

## Proposed Motion for Text Modification:

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

***Editing instructions formatted like this are intended to be copied into the TGah Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents). Changes are highlighted and indicated with revision marks.***

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

* SIG definition

The SIG field carries information required to interpret S1G format PPDUs sent with a short preamble. The structure of the SIG field for the fist symbol (SIG-1) is shown in Figure 24-7 (SIG-1 structure) and for the second symbol (SIG-2) is shown in Figure 24-8 (SIG-2 structure). The SIG field format of NDP CMAC(#3027) frames is described in Figure 24-21 (SIG field format for >= 2 MHz NDP CMAC frame).

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| B0 | B1 | B2 | B3 B4 | B5 B6 | B7 B15 | B16 | B17 B18 | B19 B22 | B23 |
| Reserved | STBC | Uplink  Indication | BW | Nsts | ID | SGI | Coding | MCS | Smoothing |
| * SIG-1 structure | | | | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| B0 | B1 B9 | B10 B11 | B12 | B13 | B14 B17 | B18 B23 |
| Aggregation | Length | Response  Indication | Doppler | NDP  Indication | CRC | Tail |
| * SIG-2 structure | | | | | | |

The SIG field of S1G format PPDUs sent with a short preamble contains the fields listed in Figure 24-7 (SIG-1 structure) and Figure 24-8 (SIG-2 structure).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| * Fields in the SIG field of short preamble | | | | |
| Symbol | Bit | Field | Number of bits | Description |
| SIG-1 | B0 | Reserved | 1 | Reserved. Set to 1. |
| B1 | STBC | 1 | Set to 1 if all spatial streams have space time block coding and set to 0 if no spatial streams has space time block coding. |
| B2 | Uplink Indication | 1 | Set to the value of the TXVECTOR parameter UPLINK\_INDICATION. |
| B3-B4 | BW | 2 | Set to 0 for 2 MHz, 1 for 4 MHz, 2 for 8 MHz, 3 for 16 MHz |
| B5-B6 | Nsts | 2 | Set to 0 for 1 space time stream  Set to 1 for 2 space time streams  Set to 2 for 3 space time streams  Set to 3 for 4 space time streams |
| B7-B15 | ID | 9 | If Uplink Indication is not present or set to 1, set to the value of the TXVECTOR parameter PARTIAL\_AID. PARTIAL\_AID provides an abbreviated indication of the intended recipient(s) of the PSDU (see Table 9.20a (Group ID, partial AID, Uplink Indication and COLOR in S1G PPDUs))). If Uplink Indication is set to 0, B7-B9 are set to the value of the TXVECTOR parameter COLOR and B10-B15 are set to the value of the TXVECTOR parameter PARTIAL\_AID. |
| B16 | Short GI | 1 | Set to 0 if short guard interval is not used in the Data field.  Set to 1 if short guard interval is used in the Data field. |
| B17-B18 | Coding | 2 | B17 set to 0 for BCC and 1 for LDPC  If B17 is 1, B18 is set to 1 if the LDPC PPDU encoding process (of an SU PPDU), results in an extra  OFDM symbol (or symbols) as described in 22.3.10.5.4 (LDPC coding), otherwise set to 0.  If B17 is 0, B18 is reserved and set to 1. |
| B19-B22 | MCS | 4 | MCS Index |
| B23 | Smoothing | 1 | A value of 1 indicates that channel smoothing is recommended.  A value of 0 indicates that channel smoothing is not recommended. |
| SIG-2 | B0 | Aggregation | 1 | Set to 1 when aggregation is ON (as indicated by AGGREGATION parameter of TXVECTOR), and 0 otherwise.(#3071)  NOTE— S1G PPDUs are transmitted with aggregation ON when PSDU to be carried is greater than 511 octets, as defined in 9.13.5 (Transport of A-MPDU by the PHY data service)(#3072) |
| B1-B9 | Length | 9 | When the Aggregation bit is set to0, set to the value of the PSDU\_LENGTH parameter in TXVECTOR. When the Aggregation bit is set to 1, set to N\_sym, given in Section 24.4.3 (TXTIME and PSDU\_LENGTH calculation).(#3527) |
| B10-B11 | Response Indication | 2 | This field indicates the presence and type of frame a SIFS after the current frame transmission.  Set to 0 if No Response.  Set to 1 if NDP Response.  Set to 2 if Normal Response.  Set to 3 if Long Response. |
| B12 | Doppler | 1 | Set to 1 to indicate traveling pilots usage in packet. Otherwise 0 to indicate regular pilot tone locations. |
| B13 | NDP Indication | 1 | Used to indicate that frame is a Control NDP frame. If set to 1, then the SIG field format is as in Figure 24-21 (SIG field format for >= 2 MHz NDP CMAC frame) and the SIG field contents follow the description in 8.9 (NDP CMAC frames) |
| B14-B17 | CRC | 4 | CRC calculated as in 24.3.8.2.1.5 (CRC calculation for S1G SIGA fields). |
| B18-B23 | Tail | 6 | Used to terminate the trellis of the convolutional decoder.  Set to 0. |

* SIG-A definition

The SIG-A field of the long preamble carries information required to interpret S1G format PPDUs sent using the long preamble. The structure of the SIG-A field is different for SU PPDUs and MU PPDUs. The structure of the SIG-A field for SU PPDUs for the first symbol (SIG-A1) is shown in Table 24-11 (SIG-A-1 structure for SU PPDU) and for the second symbol (SIG-A2) is shown in Table 24-12 (SIG-A-2 structure for SU PPDU). The structure of the SIG-A field for MU PPDUs for the first symbol (SIG-A1) is shown in Table 24-13 (SIG-A-1 structure for MU PPDU)and for the second symbol (SIG-A2) is shown in Table 24-14 (SIG-A-2 structure for MU PPDU).

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| B0 | B1 | B2 | B3 B4 | B5 B6 | B7B 15 | B16 | B17 B18 | B19 B22 | B23 |
| MU/SU | STBC | Uplink  Indication | BW | Nsts | ID | SGI | Coding | MCS | Beam-  change/Smoothing  Indication |
| * SIG-A-1 structure for SU PPDU | | | | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| B0 | B1 B9 | B10 B11 | B12 | B13 | B14 B17 | B18 B23 |
| Aggregation | Length | Response  Indication | reserved | Doppler | CRC | Tail |
| * SIG-A-2 structure for SU PPDU | | | | | | |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| B0 | B1 | B2 | B3 |  |  | B10 | B11 B12 | B13 B18 | B19 | B20 B23 |
| MU/SU | STBC | reserved | Nsts | | | | BW | GID | SGI | Coding-I |
| MU[0]  Nsts | MU[1]  Nsts | MU[2]  Nsts | MU[3]  Nsts |
| * SIG-A-1 structure for MU PPDU | | | | | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| B0 | B1 | B2 B10 | B11 B12 | B13 | B14 B17 | B18 B23 |
| Coding-II | reserved | Length | Response  Indication | Doppler | CRC | Tail |
| * SIG-A-2 structure for MU PPDU | | | | | | |

The SIG-A field of S1G format PPDUs sent with an S1G\_LONG preamble for SU contains the fields listed in Table 24-14 (Fields in the SIG-A field of S1G\_LONG preamble SU PPDU) and for MU with the fields listed in Table 24-15 (Fields in the SIG-A field of S1G\_LONG preamble MU PPDU).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| * Fields in the SIG-A field of S1G\_LONG preamble SU PPDU | | | | |
| Symbol | Bit | Field | Number of bits | Description |
| SIG-A-1 | B0 | MU/SU | 1 | Set to 0 for SU PPDUs. |
| B1 | STBC | 1 | Set to 1 if all spatial streams have space time block coding and set to 0 if no spatial streams has space time block coding.(#3563) |
| B2 | Uplink Indication | 1 | Set to the value of the TXVECTOR parameter UPLINK\_INDICATION. |
| B3-B4 | BW | 2 | Set to 0 for 2 MHz, 1 for 4 MHz, 2 for 8 MHz, 3 for 16 MHz |
| B5-B6 | Nsts | 2 | Set to 0 for 1 space time stream  Set to 1 for 2 space time streams  Set to 2 for 3 space time streams  Set to 3 for 4 space time streams |
| B7-B15 | ID | 9 | If Uplink Indication is not present or set to 1, set to the value of the TXVECTOR parameter PARTIAL\_AID. PARTIAL\_AID provides an abbreviated indication of the intended recipient(s) of the PSDU (see Table 9.17b (Group ID, partial AID, Uplink Indication and Color in S1G PPDUs))). If Uplink Indication is set to 0, B7-B9 are set to the value of the TXVECTOR parameter COLOR and B10-B15 are set to the value of the TXVECTOR parameter PARTIAL\_AID. |
| B16 | Short GI | 1 | Set to 0 if short guard interval is not used in the Data field.  Set to 1 if short guard interval is used in the Data field. |
| B17-B18 | Coding | 2 | B17 set to 0 for BCC and 1 for LDPC  If B17 is 1, B18 is set to 1 if the LDPC PPDU encoding process (of an SU PPDU), results in an extra  OFDM symbol (or symbols) as described in 22.3.10.5.4 (LDPC coding), otherwise set to 0.  If B17 is 0, B18 is reserved and set to 1. |
| B19-B22 | MCS | 4 | MCS Index |
| B23 | Beam Change/Smoothing Indication | 1 | If Nsts subfield indicates 1 space time stream. A value of 1 indicates that the Q matrix is changed from the Omni portion to the Data portion of the long preamble, in at least one of the non-zero sub-carriers of the Omni portion.  A value of 0 indicates that the Q matrix is un-changed in all the non-zero sub-carriers of the Omni portion.  If Nsts subfield indicates more than 1 space time stream. A value of 1 indicates that channel smoothing is recommended, a value of 0 indicates that channel smoothing is not recommended.  See Note-1.  See Note-2. |
| SIG-A-2 | B0 | Aggregation | 1 | Set to 1 when aggregation is ON (as indicated by AGGREGATION parameter of TXVECTOR), and 0 otherwise.(#3071)  NOTE— S1G PPDUs are transmitted with aggregation ON when PSDU to be carried is greater than 511 octets, as defined in 9.13.5 (Transport of A-MPDU by the PHY data service)(#3072) |
| B1-B9 | Length | 9 | When the Aggregation bit is set to 0, set to the value of the PSDU\_LENGTH parameter in TXVECTOR. When the Aggregation bit is set to 1, set to N\_sym, given in Section 24.4.3 (TXTIME and PSDU\_LENGTH calculation).(#3528) |
| B10-B11 | Response Indication | 2 | This field indicates the presence and type of frame a SIFS after the current frame transmission.  Set to 0 if No Response.  Set to 1 if NDP Response.  Set to 2 if Normal Response.  Set to 3 if Long Response. |
| B12 | Reserved | 1 | Reserved. Bit set to 1. |
| B13 | Doppler | 1 | Set to 1 to indicate traveling pilots usage in packet. Otherwise 0 to indicate regular pilot tone locations. |
| B14-B17 | CRC | 4 | CRC calculated as in 24.3.8.2.1.5 (CRC calculation for S1G SIGA fields). |
| B18-B23 | Tail | 6 | Used to terminate the trellis of the convolutional decoder.  Set to 0. |
| Note-1: When the Nsts subfield indicates 1 space time stream, if beam-change indication bit is set to 0, the receiver may do channel smoothing. Otherwise, smoothing is not recommended.  Note-2: The Q matrix for Omni portion is  as defined in 24.3.7 (Mathematical description of signals). | | | | |

* SIG definition

The SIG field carries information required to interpret S1G\_1M PPDUs. The structure of the 6 symbol SIG field (which carries 6 information bits per symbol) is shown in Figure 24-16 (Structure of the 6 symbol SIG field of S1G\_1M PPDU). Note that unlike other SIG field structures the indexing of the bits incorporates all the SIG field symbols. i.e., B0-B5 denote the first symbol, B6-B11 the second, and so on. The SIG field format of NDP CMAC(#3027) frames is described in Figure 24-20 (SIG field format for 1 MHz NDP CMAC frame).

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| B0 B1 | B2 | B3B4 | B5 | B6 | B7 B10 | B11 | B12 B20 | B21 B22 | B23 | B24 | B25 | B26 B29 | B30 B35 |
| Nsts | SGI | Coding | STBC | reserved | MCS | Aggregation | Length | Response  Indication | Smoothing | Doppler | NDP Indication | CRC | Tail |
| * Structure of the 6 symbol SIG field of S1G\_1M PPDU | | | | | | | | | | | | | |

The SIG field of S1G\_1M PPDU contains the fields listed in Table 24-18 (Fields in the SIG field of S1G\_1M PPDU).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| * Fields in the SIG field of S1G\_1M PPDU | | | | |
| Symbol | Bit | Field | Number of bits | Description |
| SIG-1 | B0-B1 | NSTS | 2 | Set to 0 for 1 space time stream  Set to 1 for 2 space time streams  Set to 2 for 3 space time streams  Set to 3 for 4 space time streams |
| B2 | Short GI | 1 | Set to 0 if short guard interval is not used in the Data field.  Set to 1 if short guard interval is used in the Data field. |
| B3-B4 | Coding | 2 | B3 set to 0 for BCC and 1 for LDPC  If B3 is 1, B4 is set to 1 if the LDPC PPDU encoding process (of an SU PPDU), results in an extra  OFDM symbol (or symbols) as described in 22.3.10.5.4 (LDPC coding), otherwise set to 0.  If B3 is 0, B4 is reserved and set to 1. |
| B5 | STBC | 1 | Set to 1 if all spatial streams have  space time block coding and set to 0 if no spatial streams has space time block coding. |
| SIG-2 | B6 | Reserved | 1 | Reserved. Set to 1. |
| B7-B10 | MCS | 4 | MCS Index |
| B11 | Aggregation | 1 | Set to 1 when aggregation is ON (as indicated by AGGREGATION parameter of TXVECTOR), and 0 otherwise.(#3071)  NOTE— S1G PPDUs are transmitted with aggregation ON when PSDU to be carried is greater than 511 octets, as defined in 9.13.5 (Transport of A-MPDU by the PHY data service).(#3072) |
| SIG-3 and SIG-4 | B12-B20 | Length | 9 | When the Aggregation bit is set to 0, set to the value of the PSDU\_LENGTH parameter in TXVECTOR. When the Aggregation bit is set to 1, set to N\_sym, given in Section 24.4.3 (TXTIME and PSDU\_LENGTH calculation).(#3530) |
| B21-22 | Response Indication | 2 | This field indicates the presence and type of frame a SIFS after the current frame transmission.  Set to 0 if No Response.  Set to 1 if NDP Response.  Set to 2 if Normal Response.  Set to 3 if Long Response. |
| B23 | Smoothing | 1 | A value of 1 indicates that channel smoothing is recommended.  A value of 0 indicates that channel smoothing is not recommended. |
| SIG-5 | B24 | Doppler | 1 | Set to 1 to indicate traveling pilots usage in packet. Otherwise 0 to indicate regular pilot tone locations. |
| B25 | NDP Indication | 1 | Used to indicate that frame is a Control NDP frame. If set to 1, then the SIG field format is as in Figure 24-20 (SIG field format for 1 MHz NDP CMAC frame) and the SIG field contents follow the description in 8.9 (NDP CMAC frames) |
| B26-B29 | CRC | 4 | CRC calculated as in 24.3.8.2.1.5 (CRC calculation for S1G SIGA fields). |
| SIG-6 | B30-B35 | Tail | 6 | Used to terminate the trellis of the convolutional decoder.  Set to 0. |