IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LB 200 MAC Miscellaneous comments resolution part 1 | | | | |
| Date: 2014-4-8 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | Email |
| Zander Lei | I2R | 1 Fusionopolis Way #21-01 Connexis | +65 6408 2436 | leizd@i2r.a-star.edu.sg |
| Yongho Seok | LG |  |  |  |

Abstract

This submission proposes resolutions for miscellaneous comments with the following 16 CIDs:

2380, 2512, 2977, 2532, 2043, 2869, 2555, 2870, 1225, 2529, 2530, 1509, 1723, 1724, 2377, 2410

Rev1: Comments received during conference call and offline discussions for 8.4.1.50 (CIDs 2043, 2869)

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).***

***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.***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Page.Line** | **Clause** | **Comment** | **Propose Change** | **Resolution** |
| 2380 | 39.62 | 8.3.1.19 | "with "VHT" replaced by "S1G"" -- replaced where? Ditto in 9.31.5 | Clarify (and use sexed quotes) | Revised.  TGah editor to instruct TG editor to make changes as shown under heading CID2380 in 11-14-xxxxr0 |
| 1225 | 180 | 9.31.5 | "For S1G band, the same sounding protocol is applied, with "VHT" replaced by "S1G"."  I am not exactly sure what normative effect this is intended to have. However, I cannot believe that all the normative statements with VHT in them are correct if you replace VHT with S1G - for example, all the names of frames, MIB variables etc..  Rather than trying to be cute and avoid work, show the changes. | Remove this instruction and show a changed 9.31.5 allowing for both VHT and S1G operation | Agree with the commenter to the point that copying everything in common and renaming to S1G would cause less possible confusion. However, this will cause another problem. The text will be multiplied rapidly with lots of redundance as many PHY/MAC features are inherited and modified from 11ac. To strike a balance, this compromised approach is used.  The senstence quoted has been amended.  All MIB variables with “VHT” in the subclause have been duplicated, replaced with “S1G”, and included in Annex C (due to another comment and no further actions to Annex C needed).  Revised:  TGah editor to instruct TG editor to make changes as shown under heading CID1225 in 11-14-xxxxr0 |
| 2410 |  |  | Calling things VHT when they are in fact S1G is just confusing. Affects 8.2.4.6.3 (VHT variant HT Control ield), 8.3.1.19 (VHT NDP Announcement), 8.3.5.1.6/8.4.1.48.1 (VHT Compressed Beamforming), 8.4.1.47.1 (VHT MIMO Control), 8.4.2.170k.2 (VHT Link Adaptation), 8.4.2.170w (VHT-MCS), 9.9, 9.12.2 (VHT Single MPDU), 9.31.7, 24 | Come up with S1G-specific names | Agreed to the point that copying everything in common and renaming to S1G would cause less possible confusion. However, this will cause another problem. The text will be multiplied rapidly with lots of redundance. To strike a balance, this compromised approach is used.  Revised.  TGah editor to instruct TG editor to make changes as shown under heading CID2410 in 11-14-xxxxr0 |
| 2512 | 40.06 | 8.3.1.19 | AID13 field is not defined | Provide a definition for the AID13 field | Agree with the commenter.  Revised:  TGah editor to make changes shown under heading CID2512 in 11-14-xxxxr0 |
| 2977 | 40 | 8.3.1.21 | brief description or references to FC and Duration in Figure 8-29m should be provided. There are a few FC format and FC for TACK should be specified | The Frame Control filed is as defined in 8.2.4.1 and illustrated in Figure 8-3b. The Duration field is described in 8.2.5.7. | Agree with the commenter.  Revised:  TGah editor to make changes shown under heading CID2977 in 11-14-xxxxr0 |
| 2532 |  | 8.3.5 | Until now, there seems only 2MHz NDP packet for sounding. 1MHz NDP packets are only defined for specific MAC purpose (as a short frame). It may be needed to allow to re-use 1MHz NDP MAC packets also for sounding for 1MHz covering long range | Allow to re-use 1MHz NDP MAC packets also for sounding for 1MHz covering long range. | Reject.  In the sounding protocol, NDP sounding PPDU is transmitted after the NDP Announcement frame which is has more than 20 bytes payload and is not efficient to be transmitted with 1 MHz. |
| 2529 |  | 9.31.5 | It may be needed to newly define more energy-efficient sounding protocol for beamforming (SU/MU) because power saving is one of core values in 802.11ah | Define more energy-efficient sounding protocol for beamforming (SU/MU) with the use of RAW concept. | Reject.  The comment is general and the “problem” is not well articulated. The proposed resolution is not excutable.  The comments and resolution process is mainly for identifying something broken. |
| 2530 |  | 9.31.5 | It may be needed to define efficiency beamforming sounding method especially for SU\_MIMO sounding which can be applicable to multiple STAs at the same time to enhance power saving | Define efficiency beamforming sounding method especially for SU-MIMO sounding which can be applicable to multiple STAs at the same time to enhance power saving | Reject.  The proposed resolution is not excutable.  The comments and resolution process is mainly for identifying something broken. |
| 1509 | 180 | 9.31.7 | The line: "An S1G STA shall transmit an S1G NDP using the following TXVECTOR parameters" is not clear. Does it mean an S1G STA can not use any other sounding frame? Or it mean if it decide to transmit an NDP Sounding it shall use the following parameters? | clarify the sentence | Agree with the commenter  Revised.  TGah editor to make changes shown under heading CID1509 in 11-14-xxxxr0 |
| 1723 | 163 | 9.9 | "A VHT variant HT Control field shall not be present in a frame addressed to a STA unless that STA declares support for +HTC-VHT Support subfield of its VHT Capabilities element" is out of scope of 11ah. | Restate this requirement only in terms of S1G STAs. | Rejected.  The underlined text quoted by the commenter is the original text in TGac, not added by 11ah. This misunderstanding is probably due to the reference document 11ac D5.0. |
| 1724 | 163 | 9.9 | The inverted order at the beginning of the statement "For a STA operating in the S1G band, if the value of dot11VHTControlFieldOptionImplemented is true, an S1G STA shall set the ..." confuses the meaning. | Replace the beginning of this statement with: "If the value of dot11VHTControlFieldOptionImpl emented is true, an S1G STA operating in the S1G band shall set the.... | Agreed to the commenter.  Revised.  TGah editor to make changes shown under heading CID1724 in 11-14-xxxxr0 |
| 2377 |  |  | There are lots of "NDP something frames", but the abbreviation "NDP" is not defined, and if it means "Null Data Packet" as in the baseline, then the usage is very confusing | Rename NDP to something else, and provide a definition of the new abbreviation | Rejected.  The commenter is correct that “NDP” refers to “Null Data Packet” as in the baseline. All the NDP frames used in 11ah are in fact “Null Data Packet” and should not cause confusions. It is not necessary to introduce a new term. |
|  |  |  |  |  |  |
| 2043 | 74 | 8.4.1.50 | Operating Mode Notification frame is useful to indicate that the transmitting STA is changing its operating channel width, the maximum number of spatial streams it can receive, etc but Operating Mode field has to be modified for S1G STAs | Make modification to Operating Mode Notification so that it can be used for S1G STAs | Agreed to the commenter.  Revised  TGah editor to make changes shown under heading CID2043 in 11-14-xxxxr0 |
| 2869 | 66 | 8.4.1.50 | A S1G BSS needs to support the Operating Mode Notification procedure. | Modify the Operating Mode field format for the S1G BSS. | Agreed to the commenter.  Revised  TGah editor to make changes shown under heading CID2869 in 11-14-xxxxr0 |
| 2555 |  | 9.16 | While an S1G STA supports 1MHz bandwidth, Short GI operation specified in IEEE P802.11ac D5.0 subclause 9.16 is not enough. It is necessary to specify Short GI operation for the S1G STA. | 1) Insert a new subclause 9.16a (Short GI operation for an S1G STA) as follows: ---  Insert the following text at the top of this subclause:  An S1G STA may transmit a frame with TXVECTOR parameters CH\_BANDWIDTH set to CBW1 and GI\_TYPE set to SHORT\_GI only if all of the following conditions are met:  - The TXVECTOR parameter FORMAT is equal to S1G.  - The RA of the frame corresponds to a STA for which the Short GI for 1 MHz subfield of the S1G Capabilities element contained a value of 1.  - dot11ShortGIOptionIn1MActivate d is present and is true.  An S1G STA may transmit a frame with TXVECTOR parameters CH\_BANDWIDTH set to CBW2 and GI\_TYPE set to SHORT\_GI only if all of the following conditions are met:  - The TXVECTOR parameter FORMAT is equal to S1G, S1G\_DUP\_1M.  - The RA of the frame corresponds to a STA for which the Short GI for 2 MHz subfield of the S1G Capabilities element contained a value of 1.  - dot11ShortGIOptionIn2MActivate d is present and is true.  An S1G STA may transmit a frame with TXVECTOR parameters CH\_BANDWIDTH set to CBW4 and GI\_TYPE set to SHORT\_GI only if all of the following conditions are met:  - The TXVECTOR parameter FORMAT is equal to S1G, S1G\_DUP\_1M or S1G\_DUP\_2M.  - The RA of the frame corresponds to a STA for which the Short GI for 4 MHz subfield of the S1G Capabilities element contained a value of 1.  - dot11ShortGIOptionIn4MActivate d is present and is true.  An S1G STA may transmit a frame with TXVECTOR parameters CH\_BANDWIDTH  set to CBW8 and GI\_TYPE set to SHORT\_GI only if all of the following conditions are met:  - The TXVECTOR parameter FORMAT is equal to S1G, S1G\_DUP\_1M or S1G\_DUP\_2M.  - The RA of the frame corresponds to a STA for which the Short GI for 8 MHz subfield of the S1G Capabilities element contained a value of 1.  - dot11ShortGIOptionIn8MActivate d is present and is true.  An S1G STA may transmit a frame with TXVECTOR parameters CH\_BANDWIDTH set to CBW16 and GI\_TYPE set to SHORT\_GI only if all of the following conditions are met:  - The TXVECTOR parameter FORMAT is equal to S1G, S1G\_DUP\_1M or S1G\_DUP\_2M.  - The RA of the frame corresponds to a STA for which the Short GI for 16 MHz subfield of the S1G Capabilities element contained a value of 1.  - dot11ShortGIOptionIn16MActivat ed is present and is true.  2) Change the title of 9.16 (for 11ac) to "Short GI operation for non-S1G STA". | Agreed to the commenter in general.  Revised  TGah editor to make changes shown under heading CID2555 in 11-14-xxxxr0 |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| 2870 | 165 | 9.16 | A S1G BSS needs to support the Short GI operation. | Modify the sub-clause 9.16 for supporting 1/2/4/8/16 MHz Short GI PPDU transmission. | Agreed to the commenter.  Revised  TGah editor to make changes shown under heading CID2870 in 11-14-xxxxr0 |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

### [CIDs 2380, 1225, 2410, 2512]

**Instruction to TGah editor: Please modify the text before Figure 8-29k1 (STA Info field when used in S1G band) in subclause 8.3.1.19 (VHT NDP Announcement frame formats) of TGah D1.2 as follows:**

For an S1G STA~~band~~, the same NDP announcement frame is used for sounding exchange, with "VHT" replaced by

"S1G" across the whole subclause 8.3.1.19 (VHT NDP Announcement frame formats), ~~and~~ but with the following exception:

* In Table 8-18a(STA Info subfields), Nc index field shall not indicate a value that is more than 4. The “AID 12” Field shall be changed to “AID 13” with the following description: Contains the 13 least significant bits of the AID of a STA expected to process the following S1G NDP and prepare the sounding feedback. Equal to 0 if the STA is an AP

**Instruction to TGah editor: Please modify the text in subclause 9.31.5 (S1G sounding protocol) of TGah D1.2**

For an S1G STA ~~band~~, the same sounding protocol is applied, ~~with~~ except the term “VHT” is replaced by “S1G” for the whole subclause 9.31.5 (S1G sounding protocol).

### [CID 2977]

**Instruction to TGah editor: Please insert the following as the 2nd and 3rd paragraphs in 8.3.1.21 (TACK frame format):**

The FC field is defined as in 8.2.4.1 (Frame Control field) and illustrated as in Figure 8-3b.

The Duration field is described in 8.2.5.7 (Setting for control response frames)

### [CID 1509]

**Instruction to TGah editor: Please modify the 1st paragraph of subclause 9.31.7 (Transmission of an S1G NDP Sounding Frame) as follows:**

**9.31.7 Transmission of an S1G NDP Sounding Frame**

An S1G NDP Sounding frame shall use the 2 MHz short format as described in 24.1.4 (PPDU formats). An S1G STA ~~shall transmit~~ transmitting an S1G NDP Sounding frame ~~using~~ shall use the following TXVECTOR parameters:

### [CID 1723, 1724]

***Instruction to TG editor: Modify the following paragraph at the end of the subclause 9.9 (HT Control field operation) in Draft 1.2:***

~~For a STA operating in the S1G band, i~~If the value of dot11VHTControlFieldOptionImplemented is true, an S1G STA shall set the +HTC-VHT Support subfield of the S1G Capabilities Info field of the S1G Capabilities element to 1 in S1G Capabilities elements that it transmits

### [CID 2043, 2869]

**Instruction to TGah editor: Please Modify Subclause 8.4.1.50 Operating Mode field(11ac) of REVmc D2.5 to the following:**

**8.4.1.50 Operating Mode field(11ac and 11ah)**

The Operating Mode field is present in the Operating Mode Notification frame (see 8.6.23.4 (VHT Operating Mode Notification frame format(11ac) for a VHT STA or 8.6.24.13 (S1G Operating Mode Notification frame format(11ah) for an S1G STA) and Operating Mode Notification element (see 8.4.2.165 (Operating Mode Notification element(11ac and 11ah)))

The Operating Mode field for a VHT STA is shown in Figure 8-114 (Operating Mode field(11ac)).

(Note to the editor: no change to the figure)

**Figure 8-114—Operating Mode field(11ac)**

The Operating Mode field for an S1G STA is shown in Figure 8-114a (Operating Mode field(11ah)).

(Note to the editor: Please copy Figure 8-114 here and replace “2” under “Channel Width” to “3”, “B1” above “Channel Width” to “B2”, “B2 B3” above “Reserved” to )

The Operating Mode field is shown in Figure 8-114 (Operating Mode field(11ac)).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | B0 B2 | B3 B4 | B5 B6 | B7 |
|  | Channel Width | Reserved | Rx NSS | Rx NSS Type |
| Bits: | 3 | 2 | 2 | 1 |

**Figure 8-114a—Operating Mode field(11ah)**

The STA transmitting this field indicates its current operating channel width and the number of spatial streams it can receive using the settings defined in Table 8-72 (Subfield values of the Operating Mode field(11ac and 11ah)).

**Table 8-72—Subfield values of the Operating Mode field(11ac** **and 11ah)**

|  |  |
| --- | --- |
| **Subfield** | **Description** |
| Channel Width | If the Rx NSS Type subfield is 0, indicates the supported channel width:  For a non-S1G STA:  Set to 0 for 20 MHz  Set to 1 for 40 MHz  Set to 2 for 80 MHz  Set to 3 for 160 MHz or 80+80 MHz  …  For a S1G STA:  Set to 0 for 1 MHz  Set to 1 for 2 MHz  Set to 2 for 4 MHz  Set to 3 for 8 MHz  Set to 4 for 16 MHz  Reserved for values 5-7  Reserved if the Rx NSS Type subfield is 1. |
| Rx NSS | If the Rx NSS Type subfield is 0, indicates the maximum number of spatial streams that the STA can receive.  If the Rx NSS Type subfield is 1, indicates the maximum number of spatial streams that the STA can receive as a beamformee in an SU PPDU using a beamforming steering matrix derived from a VHT Compressed Beamforming report with Feedback Type subfield indicating MU in the corresponding VHT Compressed Beamforming frame sent by the STA.  For a non-S1G STA:  Set to 0 for *NSS* =1  Set to 1 for *NSS* =2  …  Set to 7 for *NSS* =8  For a S1G STA:  Set to 0 for *NSS* =1  Set to 1 for *NSS* =2  Set to 2 for *NSS* =3  Set to 3 for *NSS* =4 |
| Rx NSS Type | Set to 0 to indicate that the Rx NSS subfield carries the maximum number of spatial streams that the STA can receive. Set to 1 to indicate that the Rx NSS subfield carries the maximum number of spatial streams that the STA can receive in an SU PPDU using a beamforming steering matrix derived from a VHT Compressed Beamforming report with the Feedback Type subfield indicating MU in the corresponding VHT Compressed Beamforming frame sent by the STA.  NOTE—An AP always sets this field to 0. |

**Instruction to TGah editor: Please modify Subclause 8.6.23.4 S1G Operating Mode Notification frame format in REVmc D2.5 as following:**

**8.6.23.4 S1G Operating Mode Notification frame format (11ac and 11ah)**

The Operating Mode Notification frame is an Action frame of category VHT for a VHT STA or an Action frame of category S1G for an S1G STA. It is used to notify STAs that the transmitting STA is changing its operating channel width, the maximum number of spatial streams it can receive, or both.

The Action field of the Operating Mode Notification frame contains the information shown in **Table 8-363la** (S1G Operating Mode Notification frame Action field format(11ac and 11ah)).

**Table 8-281ak S1G Operating Mode Notification frame Action field format**(11ac and 11ah)

|  |  |
| --- | --- |
| Order | Information |
| 1 | Category |
| 2 | VHT Action for a VHT STA or S1G Action for an S1G STA |
| 3 | Operating Mode (see 8.4.1.50 (Operating Mode field(11ac and 11ah))) |
| 4 | Multi-band (optional) |

The Category field is set to the value for VHT, specified in Table 8-46 (Category values(#2019)).

The VHT Action field is set to the value for Operating Mode Notification, specified in Table 8-387 (VHT Action field values(11ac)).

When present in an Operating Mode Notification frame, the Multi-band element indicates the frequency band, operating class, and channel number to which the Operating Mode Notification frame applies and contains band-specific information.



### [CID 2555, 2870]

**Instruction to TGah editor: Please Insert the following text in subclause 9.17 (Short GI operation) starting from the 5th paragraph as follows (Based on REVmc D2.5):**

**9.17 Short GI operation**

…

An S1G STA may transmit a frame with TXVECTOR parameters CH\_BANDWIDTH set to CBW1 and GI\_TYPE set to SHORT\_GI only if all of the following conditions are met:

* The RA of the frame corresponds to a STA for which the Short GI for 1 MHz subfield of the S1G Capabilities element contained a value of 1.
* dot11ShortGIOptionIn1MActivated is present and is true.

An S1G STA may transmit a frame with TXVECTOR parameters CH\_BANDWIDTH set to CBW2 and GI\_TYPE set to SHORT\_GI only if all of the following conditions are met:

* The RA of the frame corresponds to a STA for which the Short GI for 2MHz subfield of the S1G Capabilities element contained a value of 1.
* dot11ShortGIOptionIn2MActivated is present and is true.

An S1G STA may transmit a frame with TXVECTOR parameters CH\_BANDWIDTH set to CBW4 and GI\_TYPE set to SHORT\_GI only if all of the following conditions are met:

* The RA of the frame corresponds to a STA for which the Short GI for 4MHz subfield of the S1G Capabilities element contained a value of 1.
* dot11ShortGIOptionIn4MActivated is present and is true.

An S1G STA may transmit a frame with TXVECTOR parameters CH\_BANDWIDTH set to CBW8 and GI\_TYPE set to SHORT\_GI only if all of the following conditions are met:

* The RA of the frame corresponds to a STA for which the Short GI for 8MHz subfield of the S1G Capabilities element contained a value of 1.
* dot11ShortGIOptionIn8MActivated is present and is true.

An S1G STA may transmit a frame with TXVECTOR parameters CH\_BANDWIDTH set to CBW16 and GI\_TYPE set to SHORT\_GI only if all of the following conditions are met:

* The RA of the frame corresponds to a STA for which the Short GI for 16MHz subfield of the S1G Capabilities element contained a value of 1.
* dot11ShortGIOptionIn16MActivated is present and is true.

An S1G STA may transmit a frame with TXVECTOR parameters NUM\_USERS set to greater than 1, and GI\_TYPE set to SHORT\_GI only if all of the following conditions are met:

* The RAs of all MPDUs in the S1G MU PPDU correspond to STAs for which the Short GI subfield of the following conditions are satisfied:
  + If the TXVECTOR parameter CH\_BANDWIDTH is set to CBW2, the Short GI for 2MHz subfields of the S1G Capabilities element contained a value of 1, and dot11ShortGIOptionIn1MActivated is present and is true.
  + If the TXVECTOR parameter CH\_BANDWIDTH is set to CBW4, the Short GI for 4MHz subfields of the S1G Capabilities element contained a value of 1, and dot11ShortGIOptionIn4MActivated is present and is true.
  + If the TXVECTOR parameter CH\_BANDWIDTH is set to CBW8, the Short GI for 8MHz subfields of the S1G Capabilities element contained a value of 1, and dot11ShortGIOptionIn8MActivated is present and is true.
  + If the TXVECTOR parameter CH\_BANDWIDTH is set to CBW16, the Short GI for 16MHz subfields of the S1G Capabilities element contained a value of 1, and dot11ShortGIOptionIn16MActivated is present and is true.