IEEE P802.11
Wireless LANs

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| CC9 cluase 8.4.2.170k comment resolution |
| Date: 2013-09-15 |
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|  |  |  |  |  |

Abstract

This submission proposes comment resolutions of the following CIDs from TGah Draft 0.1 Comment Collection 9.

* 823, 818, 579, 494, 195, 192, 540, 849

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** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| --- | --- | --- | --- | --- | --- |
| 823 | 91.00 | 8.4.2.170k | Many S1G capabilities for operation modes already present in the baseline are missing. How are the relevant capabilities currently present in HT/VHT capability elements represented? | Define how S1G represents the capabilities for features like HTC, Control Wrapper, LDPC, Short GIA-MPDUSupported MCSs, BW, SM POWER , GI per BW, TX/RX STBC, Delayed BA, A-MSDU, FLA, +HTC, RD, MPDU lenTX/RX BF capabilities, STS. Sounding dimensions MU TX/RXTXOP PS, A-MPDU len, RX antenna pattern consistencyetc.. | Revised- TGah editor to make changes shown in 11-13-1085r0 under the heading for CID 823, 818, 579, 494, 195, 192, 540, 849 |
| 818 | 91.00 | 8.4.2.170k | There is no S1G Operation element | define an S1G operation element and include all the necessary information, such as operating BW,Basic MCS Set, etc... | Revised- TGah editor to make changes shown in 11-13-1085r0 under the heading for CID 823, 818, 579, 494, 195, 192, 540, 849 |
| 579 | 91.00 | 8.4.2.170k | As the S1G PHY is based on the VHT PHY, which in turn based on HT PHY, both a VHT capabilities element and an HT capabilities element are required to determine capabilities of an S1G STA. It has large overheads.The S1G Capabilities element shall include subset of the VHT capabilities element and the HT Capabilities element, and S1G PHY specific options such as:- Supported channel width set.- Travelling pilots capable. | 1) Extend the S1G Capabilities info field to add following subfields.- Supported channel width set, which specifies 2MHz, 4MHz, 8MHz and 16MHz bandwidth.- Travelling Pilots capable2) Add the VHT Capabilities info field which contains the subset of f the VHT capabilities element and the HT Capabilities element.Details are TBD. | Revised- TGah editor to make changes shown in 11-13-1085r0 under the heading for CID 823, 818, 579, 494, 195, 192, 540, 849 |
| 494 | 91.00 | 8.4.2.170k.1 | The S1G Capabilities Info element contains a TBD field. Define the TBD field. | Define the TBD field similar to the Supported VHT-MCS and NSS Set field define in Tgac D5.0 subclause 8.4.2.160.3 to convey the combination of VHT-MCSs and spatial streams that a STA support for reception and transmission. | Revised- TGah editor to make changes shown in 11-13-1085r0 under the heading for CID 823, 818, 579, 494, 195, 192, 540, 849 |
| 195 | 91.00 | 8.4.2.170k | Too many MAC features, would need a monster design to implement all of them, not possible to achieve our original goal for 11ah: "low power & low cost". | clearly specify mandatory and optional features for MAC features as described in clause 9, with a high bar for mandatory; reflect the optional feastures in the S1G capabilities fields. | Revised- TGah editor to make changes shown in 11-13-1085r0 under the heading for CID 823, 818, 579, 494, 195, 192, 540, 849 |
| 192 | 91.00 | 8.4.2.170k | PHY related S1G capabilities are missing | add PHY related capabilities based on descriptions in clause 24.1.1 | Revised- TGah editor to make changes shown in 11-13-1085r0 under the heading for CID 823, 818, 579, 494, 195, 192, 540, 849 |
| 540 | 92.00 | 8.4.2.170k.2 | From MIB naming convention, it is better to use "dot11TWTOptionActivated" than "dot11TWTOptionActive" in subclause 8.4.2.170k.2 and 9.32f.1. | Modify "dot11TWTOptionActive" to "dot11TWTOptionActivated". | Revised- TGah editor to make changes shown in 11-13-1085r0 under the heading for CID 823, 818, 579, 494, 195, 192, 540, 849 |
| 849 | 93.00 | 8.4.2.170k.2 S1G Capabilities info field | S1G capabilities says that : "If sent by a non-AP STA:Set to 0 if the STA is both Sensor" How the AP manages STA which is both.type and non-Sensor type STA." | Remove this option, STA should be either sensor or a non-sensor | Revised- TGah editor to make changes shown in 11-13-1085r0 under the heading for CID 823, 818, 579, 494, 195, 192, 540, 849 |

**CID 823, 818, 579, 494, 195, 192, 540, 849**

**Discussion:**

The S1G Capabilities element contains a TBD field. The S1G Capabilities element should include a subset of the HT capabilities element and the VHT Capabilities element, and S1G MAC/PHY optional features.

**Propose:**

Revised for CID 823, 818, 579, 494, 195, 192, 540, 849, per discussion and editing instructions in 11-13/1085r0.

***TGah editor: Modify the sub-clause 8.4.2.170k as the following:***

**8.4.2.170k S1G Capabilities element**

**8.4.2.170k.1 S1G Capabilities element structure**

A S1G STA declares that it is a S1G STA by transmitting the S1G Capabilities element.

The S1G Capabilities element contains a number of fields that are used to advertise S1G capabilities of a S1G STA. The S1G Capabilities element is defined in Figure 8-401df (S1G Capabilities element format).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| . |  |  |  |  |
|  | Element ID | Length | S1G Capabilities Info | ~~TBD~~ Supported S1GMCS and NSS Set |
| Octets: | 1 | 1 | ~~2(#482)~~ 6 | ~~m (TBD)~~ 5 |
| **Figure 8-401df—S1G Capabilities element format** |

The Element ID field is set to the value for S1G Capabilities element defined in Table 8-55 (Element IDs).

The Length field of the S1G Capabilities element is set to TBD.

**8.4.2.170k.2 S1G Capabilities info field**

The structure of the S1G Capabilities Info field is defined in Figure 8-401dg (S1G Capabilities Info field).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 | B1 | B2 | B3 | B4 | B5 | B6 B7 |
|  | Traveling Pilots | Short GI for 1 MHz | Short GI for 2 MHz | Short GI for 4 MHz | Short GI for 8 MHz | Short GI for 16 MHz | Supported Channel Width |
| Bits: | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
|  | B8 | B9 | B10 | B11 | B12 | B13 B15 |
|  | Rx LDPC | Tx STBC | Rx STBC | SU Beamformer Capable | SU Beamformee Capable | Beamformee STS Capability |
| Bits: | 1 | 1 | 1 | 1 | 1 | 3 |
|  | B16 B18 | B19 | B20 | B21 | B22 | B23 |
|  | Number Of Sounding Dimensions | MU Beamformer Capable | MU Beamformee Capable | +HTC-VHT Capable | VHT Link Adaptation Capable | 2 MHz Long Format |
| Bits: | 3 | 1 | 1 | 1 | 1 | 1 |
|  | ~~B0~~B24 | ~~B1~~B25 | ~~B2~~B26 | ~~B3~~B27 | ~~B4~~B28 | ~~B5~~B29 | ~~B6~~B30 ~~B7~~B31 |
|  | Uplink Synch Capable | DynamicAID | BATSupport | TIM ADESupport | Non-TIMSupport | TWTSupport | STA TypeSupport |
| Bits: | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
|  | ~~B8~~B32 | ~~B9~~B33 | ~~B10~~B34 | ~~B11~~B35 | ~~B12~~B36 | ~~B13~~B37 | ~~B14~~B38 | ~~B15~~B39 |
|  | CentralizedAuthenticationControl(#482) | DistributedAuthenticationControl(#482) | A-MSDUSupported(#10) | A-MPDUSupported(#10,321) | AsymmetricBlockAckSupported  | OBSS Mitigation Support | Fragment BA Support | RD Responder |
| Bits: | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
|  | B40 | B41 | B42 B43 | B44 B46 | B47 |
|  | HT-Delayed Block Ack | Maximum A-MSDU Length | Maximum A-MPDU Length Exponent | Minimum MPDU Start Spacing | Reserved |
| Bits: | 1 | 1 | 2 | 3 | 1 |
| **Figure 8-401dg—S1G Capabilities Info field** |

The subfields of the S1G Capabilities Info field are defined in Table 8-191d (Subfields of the S1G Capabilities Info field).

|  |
| --- |
| **Table 8-191d—Subfields of the S1G Capabilities Info field** |
| Subfield | Definition | Encoding |
| Traveling Pilots | Indicates support for the reception of PPDUs with a traveling pilots.See 24.3.9.10 (Pilot subcarriers). | Set to 0 if not supported.Set to 1 if supported. |
| Short GI for 1 MHz | Indicates short GI support for the reception of packets transmitted with TXVECTOR parameters FORMAT equal to S1G and CH\_BANDWIDTH equal to CBW1. | Set to 0 if not supported.Set to 1 if supported. |
| Short GI for 2 MHz | Indicates short GI support for the reception of packets transmitted with TXVECTOR parameters FORMAT equal to S1G and CH\_BANDWIDTH equal to CBW2. | Set to 0 if not supported.Set to 1 if supported. |
| Short GI for 4 MHz | Indicates short GI support for the reception of packets transmitted with TXVECTOR parameters FORMAT equal to S1G and CH\_BANDWIDTH equal to CBW4. | Set to 0 if not supported.Set to 1 if supported. |
| Short GI for 8 MHz | Indicates short GI support for the reception of packets transmitted with TXVECTOR parameters FORMAT equal to S1G and CH\_BANDWIDTH equal to CBW8. | Set to 0 if not supported.Set to 1 if supported. |
| Short GI for 16 MHz | Indicates short GI support for the reception of packets transmitted with TXVECTOR parameters FORMAT equal to S1G and CH\_BANDWIDTH equal to CBW16. | Set to 0 if not supported.Set to 1 if supported. |
| Supported Channel Width | Indicates the channel widths supported by the STA. See 10.43a (S1G BSS operation). | Set to 0 if the STA supports 1 MHz and 2 MHz operation.Set to 1 if the STA supports 1 MHz, 2 MHz and 4 MHz operation.Set to 2 if the STA supports 1 MHz, 2 MHz, 4 MHz and 8 MHz operation.Set to 3 if the STA supports 1 MHz, 2 MHz, 4 MHz 8 MHz and 16 MHz operation. |
| Rx LDPC | Indicates support for receiving LDPC encoded packets. | Set to 0 if not supported.Set to 1 if supported. |
| Tx STBC | Indicates support for the transmission of at least 2x1 STBC. | Set to 0 if not supported.Set to 1 if supported. |
| Rx STBC | Indicates support for the reception of PPDUs using STBC. | Set to 0 if not supported.Set to 1 if supported. |
| SU Beamformer Capable | Indicates support for operation as an SU beamformer (see 9.31.5 (VHT sounding protocol)). | Set to 0 if not supported.Set to 1 if supported. |
| SU Beamformee Capable | Indicates support for operation as an SU beamformee (see 9.31.5 (VHT sounding protocol)). | Set to 0 if not supported.Set to 1 if supported. |
| Beamformee STS Capability | The maximum number of space-time streams that the STA can receive in a S1G NDP, the maximum value for N*STS,total* that can be sent to the STA in a S1G MU PPDU if the STA is MU beamformee capable and the maximum value of *Nr* that the STA transmits in a S1G Compressed Beamforming frame. | If SU beamformee capable, set to maximum number of space-time streams that the STA can receive in a S1G NDP minus 1.Otherwise reserved. |
| Number Of Sounding Dimensions | Beamformer’s capability indicating the maximum value of the TXVECTOR parameter NUM\_STS for a S1G NDP. | If SU beamformer capable, set to the maximum supported value of the TXVECTOR parameter NUM\_STS minus 1.Otherwise reserved. |
| MU Beamformer Capable | Indicates support for operation as an MU beamformer (see 9.31.5 (VHT sounding protocol)). | Set to 0 if not supported or if SU Beamformer Capable is set to 0 or if sent by a non-AP STA.Set to 1 if supported and SU Beamformer Capable is set to 1. |
| MU Beamformee Capable | Indicates support for operationas an MU beamformee (see9.31.5 (VHT sounding protocol)). | Set to 0 if not supported or if SU Beamformee Capable is set to 0 or if sent by an AP.Set to 1 if supported and SU Beamformee Capable is set to 1. |
| +HTC-VHT Capable | Indicates whether or not the STA supports receiving a VHT variant HT Control field. | Set to 0 if not supported.Set to 1 if supported. |
| VHT Link Adaptation Capable | Indicates whether or not the STA supports link adaptation using VHT variant HT Control field. | If +HTC-VHT Capable is 1:Set to 0 (No Feedback) if the STA does not provide VHT MFB.Set to 2 (Unsolicited) if the STA provides only unsolicited VHT MFB.Set to 3 (Both) if the STA can provide VHT MFB in response to VHT MRQ and if the STA provides unsolicited VHT MFB.The value 1 is reserved.Reserved if +HTC-VHT Capable is 0. |
| 2 MHz Long Format  | Indicates support for the reception of PPDUs with 2MHz Long Format.See 24.3.2 (S1G PPDU formats). | Set to 0 if not supported.Set to 1 if supported. |
| Uplink Synch Capable | If sent by an AP STA, this subfield indicates support for synch frame transmission for uplink.If sent by a non-AP STA, this subfield indicates request for synch frame transmission for uplink.(see 9.32h.1 (Synch frame transmission procedure for uplink traffic) | If sent by an AP STA: Set to 0 if not supported.Set to 1 if supported.If sent by a non-AP STA:Set to 0 if not requested.Set to 1 if requested.  |
| Dynamic AID | The STA sets the Dynamic AID field to 1 when dot11DynamicAIDActivated is true, and sets it to 0 otherwise. See 10.43b (Dynamic AID assignment operation). | Set to 1 if dot11DynamicAIDActivated is true.Set to 0 otherwise. |
| BAT Support | The BAT Support subfield indicates support for the use of the BAT frame in Block Agreements. When dot11BATImplemented is true, this field is set to 1 to indicate support for BAT frames as both originator and recipient. | Set to 1 if dot11BATImplemented is true.Set to 0 otherwise. |
| TIM ADE Support | This bit indicates support of the ADE mode of TIM bitmap encoding as described in 8.4.2.7.1.4 (ADE mode). | Set to 1 if a STA supports the ADE mode of TIM bitmap encoding as described in 8.4.2.7.1.4 (ADE mode).Set to 0 otherwise. |
| Non-TIM Support | This bit indicates support of Non-TIM mode. | For a non-AP STA:Set to 0: the non-AP STA does not support Non-TIM mode, it needs TIM entry as in legacy PS modeSet to 1: the non-AP STA supports Non-TIM mode and it does not need TIM entry when in Non-TIM modeFor an AP STA:Set to 0: the AP STA does not support STA's Non-TIM modeSet to 1: the AP STA supports STA's Non-TIM mode |
| TWT Support | This bit indicates support of TWT described in 9.32f (Target Wake Time). | Set to 1 if dot11TWTOption~~Active~~Activated is true.Set to 0 otherwise. |
| STA Type Support | If sent by an AP STA, this subfield indicates STA types that are supported by the AP STA.If sent by a non-AP STA, this subfield indicates STA types of the non-AP STA. | If sent by an AP STA:Set to 0 if the AP STA supports both a Sensor type and a non-Sensor type STA.Set to 1 if the AP STA supports only a Sensor type STA.Set to 2 if the AP STA supports only a non-Sensor type STA.3 is reserved.If sent by a non-AP STA:Set to 0 if the STA is both Sensor type and non-Sensor type STA.Set to 1 if the STA is a Sensor type STA.Set to 2 if the STA is a non-Sensor type STA.3 is reserved. |
| Centralized Authentication Control(#482) | This field indicates support of the centralized authentication control defined in 10.3.7.1. | Set to 1 if dot11S1GCentralizedAuthenticationControlActivated is true. Set to 0 otherwise. |
| Distributed Authentication Control(#482) | This field indicates support of the distributed authentication control defined in 10.3.7.2. | Set to 1 if dot11S1GDistributedAuthenticationControlActivated is true. Set to 0 otherwise. |
| A-MSDU Supported(#10) | This bit indicates support of Aggregated MSDU | Set to 1 if dot11AMSDUSupport is true.Set to 0 otherwise. |
| A-MPDU Supported(#10,321) | This bit indicates support of Aggregated MPDU | Set to 1 if dot11AMPDUSupport is true.Set to 0 otherwise. |
| Asymmetric Block Ack Supported(#814) | This bit indicates support of Asymmetric Block Ack | Set to 1 if dot11AsymmetricBlockAckSupport is true.Set to 0 otherwise. |
| OBSS Mitigation Support(#883,75,247) | The OBSS Mitigation Support subfield indicates whether the STA supports a usable channel indication mechanism for OBSS Mitigation. See 9.32r (OBSS Mitigation Procedure). | The field is set to 1 to indicate that the STA supports a usable channel indication mechanism and set to 0 to indicate that the STA does not support a usable channel indication mechanism. |
| Fragment BA Support | This bit indicates support of Fragment BA procedure. | Set to 1 if dot11FragmentBAOptionImplemented is true.Set to 0 otherwise. |
| RD Responder | Indicates support for acting as a reverse direction responder, i.e., the STA may use an offered RDG to transmit data to an RD initiator using the reverse direction protocol described in 9.26 (Reverse direction protocol). | Set to 0 if not supportedSet to 1 if supported |
| HT-Delayed Block Ack | Indicates support for HTdelayed Block Ack operation. See 9.22.8 (HT-delayed Block Ack extensions). | Set to 0 if not supported.Set to 1 if supported.Support indicates that the STA is able to accept an ADDBA request for HT-delayed Block Ack. |
| Maximum A-MSDU Length | Indicates maximum AMSDU length.See 9.11 (A-MSDU operation). | Set to 0 for 3839 octets.Set to 1 for 7935 octets. |
| Maximum A-MPDU Length Exponent | Indicates the maximum length of A-MPDU that the STA can receive. EOF padding is not included in this limit. | This field is an integer in the range 0 to 3.The length defined by this field is equal to $2^{\left(13+Maximum A-MPDU Length Exponent\right)}-1$ octets. |
| Minimum MPDU Start Spacing | Determines the minimum time between the start of adjacent MPDUs within an A-MPDU that the STA can receive, measured at the PHY-SAP.See 9.12.3 (Minimum MPDU Start Spacing field). | Set to 0 for no restriction.Set to 1 for 1/4 μs.Set to 2 for 1/2 μs.Set to 3 for 1 μs.Set to 4 for 2 μs.Set to 5 for 4 μs.Set to 6 for 8 μs.Set to 7 for 16 μs. |

**8.4.2.170k.3 Supported S1G-MCS and NSS Set field**

The Supported S1G-MCS and NSS Set field is used to convey the combinations of S1G-MCSs and spatial streams that a STA supports for reception and the combinations that it supports for transmission. The structure of the field is shown in Figure 8-4-2-170k-3-1.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | B0 B7 | B8 B16 | B17 B24 | B25 B33 | B34 B39 |
|  | Rx S1G-MCS Map | Rx Highest Supported Long GI Data Rate | Tx S1G-MCS Map | Tx Highest Supported Long GI Data Rate | Reserved  |
| Bits: | 8 | 9 | 8 | 9 | 6 |

The Supported S1G-MCS and NSS Set subfields are defined in Table 8-4-2-170k-3-2 (Supported S1G-MCS and NSS Set subfields).

|  |
| --- |
| Table 8-4-2-170k-3-2—Supported S1G-MCS and NSS Set subfields |
| Subfield | Definition | Encoding |
| Rx S1G-MCS Map | Indicates the maximum value of the RXVECTOR parameter MCS of a PPDU that can be received at all channel widths supported by this STA for each number of spatial streams. | The format and encoding of this subfield are defined in Figure 8-4-2-170k-3-3 and the associated description. |
| Rx Highest Supported Long GI Data Rate | Indicates the highest long GI S1G data rate that the STA is able to receive. | The largest integer value less than or equal to the highest long GI S1G PPDU data rate in Mb/s the STA is able to receive (see 9.7.11a.1 (Rx Supported S1G-MCS and NSS Set)).The value 0 indicates that this subfield does not specify the highest long GI S1G PPDU data rate that the STA is able to receive. |
| Tx S1G-MCS Map | Indicates the maximum value of the TXVECTOR parameter MCS of a PPDU that can be transmitted at all channel widths supported by this STA for each number of spatial streams. | The format and encoding of this subfield are defined in Figure 8-4-2-170k-3-3 and the associated description. |
| Tx Highest Supported Long GI Data Rate | Indicates the highest long GI S1G PPDU data rate that the STA is able to transmit at. | The largest integer value less than or equal to the highest long GI S1G PPDU data rate in Mb/s that the STA is able to transmit (see 9.7.11a.2 (Tx Supported S1G-MCS and NSS Set)).The value 0 indicates that this subfield does not specify the highest long GI S1G PPDU data rate that the STA is able to transmit. |

The Rx S1G-MCS Map subfield and the Tx S1G-MCS Map subfield have the structure shown in Figure 8-4-2-170k-3-3.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | B0 B1 | B2 B3 | B4 B5 | B6 B7 |
|  | Max S1G-MCS For 1 SS | Max S1G-MCS For 2 SS | Max S1G-MCS For 3 SS | Max S1G-MCS For 4 SS |
| Bits: | 2 | 2 | 2 | 2 |

Figure 8-4-2-170k-3-2—Rx S1G-MCS Map, Tx S1G-MCS Map and Basic S1G-MCS and NSS Set

 The Max VHT-MCS For *n* SS subfield (where *n*=1,...,8) is encoded as follows:

* 0 indicates support for VHT-MCS TBD for *n* spatial streams
* 1 indicates support for VHT-MCS TBD for *n* spatial streams
* 2 indicates support for VHT-MCS TBD for *n* spatial streams
* 3 indicates that *n* spatial streams is not supported

NOTE—A S1G-MCS indicated as supported in the S1G-MCS Map fields for a particular number of spatial streams might not be valid at all bandwidths (see 24.5 (Parameters for S1G-MCSs)) and might be limited by the declaration of Tx Highest Supported Long GI Data Rates and Rx Highest Supported Long GI Data Rates and might be affected by 9.7.11a.3 (Additional rate selection constraints for S1G PPDUs).

***TGah editor: Replace “dot11TWTOptionActive” with “dot11TWTOptionActivated”at P154 L62 and P155 L14.***

***TGah editor: Replace “dot11TWTOptionActivate” with “dot11TWTOptionActivated”at P11 L30, P16 L42, P20 L34, and P25 L42.***