IEEE P802.11
Wireless LANs

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| TGah D0.1 MAC Comment Resolutions on Sectorization |
| Date: 2013-09-14 |
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This document provides MAC resolutions for the remaining CIDs on Sectorization.

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| **CID** | **Commenter** | **Clause Number** | **Page** | **Line** | **Comment** | **Proposed change** | **Resolution** |
| 133 | Anna Pantelidou | 9.32m.4.1 | 155 | 64 | In the Sector Training section a STA may choose the best sector based on instantaneous or averaged CSI. Is this sector unique? If not, is there any priority in how the STA will decide the best sector? Does a STA always return a single sector? | Please explanin. | REJECT.Refer to Doc. 13/1120r0. |
| <Discussion>The STA could be in more than one sector. A STA can choose the best sector based on a variety of factor such as CSI, SNR, or interference. The method in which a STA determines the quality of the AP signal is implementation specific and is out of the scope of this standard. The STA feedbacks using the Sector ID Feedback frame in which the STA reports the preferred Sector ID and the corresponding SNR and additionally, the STA also reports the sectors in which it can receive the AP signal to allow AP more flexibility.**TGah editor: No change** |
| 425 | Minho Cheong | 9.32m.4 | 155 | 64 | It is needed to define a very short efficienct packet to report the selected sector to AP when sectorized operation. It may be better if we can protect those packets in a RAW (report RAW). | as in the comment | ACCEPT.Refer to Doc. 13/1120r0. |
| 878 | Yongho Seok | 9.32m.4.3 | 158 | 3 | "A station may optionally use a VHT action frame (see 8.5.23.4a) for (solicited and unsolicited) Sector ID feedback."Is there any reason to use a VHT action frame for the Sector ID feedback?Sectorized beam operation is not related with the VHT. Don't use a VHT action frame. Instead, please use a S1G action frame. | Sector ID feedback frame should use a S1G Action frame. | ACCEPT. Refer to Doc. 13/1120r0. |
| <Discussion>It may be better to have short packet such as NDP type for fast sectory discovery. NDP PS-POLL canbe easily re-used using the currently defined format with Preferred Sector ID (3 bits) in the Preferred MCS (4bits).**TGah editor: modify the D0.2 text from P175L01, as follows****9.32m.4.3 Sector ID feedback**A station may optionally use an S1G action frame (see 8.5.23a) for (solicited and unsolicited) Sector IDfeedback .**9.32m.4.4 Fast Sector Discovery**When multiple STAs report their sector IDs using the Sector ID feedback frames to AP, Sector ID feedback frames may beprotected by Sector Report RAW indicated in the beacon to avoid contentions with others. Within a Sector Report RAW, Sector ID feedback may also be transmitted using NDP PS-POLL frames with preferred Sector ID specified in the 3 LSBs of the sub-field Preferred MCS. The Sector Report RAW may be assigned after the Sounding RAW for fast sector discovery of multipleSTAs.**TGah editor: modify the D0.2 text from P226L32, as follows***Change its clause number of re-place it under clause 8.5.23a (S1G Action Frames).*8.5.23a.10 S1G Sector ID Feedback frame formatThe Sector ID Feedback frame is an Action or Action No Ack frame of category S1G. The format of its Action field is defined in Table 8-281al (Sector ID Feedback frame Action field format).

|  |
| --- |
| * Sector ID Feedback frame Action field format
 |
| Order | Information |
| 1 | Category |
| 2 | S1G Action |
| 3 | Sector ID Index |

The Category field is set to the value for S1G, specified in Table 8-38 (Category values). The S1G action is set to TBD (3 or higher) and the Sector ID index is shown in Figure 8-401dz (Sector ID Index format).

|  |  |  |  |
| --- | --- | --- | --- |
|  | Preferred Sector ID | SNR | Receive Sector Bitmap |
| Bits: | 3 | 5 | 8 |
| * Sector ID Index format
 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | I0 | I1 | I2 | I3 | I4 | I5 | I6 | I7 |
| Bits: | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| * Receive Sector Bitmap format
 |

The Preferred Sector ID field is 3 bits in length and indicates the sector in which highest quality of AP signal is received by the STA. The method in which a STA determines the high quality AP signal is out of the scope of this standard. The SNR field is 5 bits in length and indicates the received SNR at the preferred Sector, 0 to 30 represents SNR values from -3 to 27 dB, respectively. If the SNR value is less than -3dB, set to 0. If the SNR value is greater than 27db, set to 30. 31 indicates no feedback.The Receive Sector Bitmap field is 8 bits in length. A bit position set to 0 within the bit map indicates that the STA does not receive the AP signal in the corresponding Sector ID. A bit position set to 1 within the bit map indicates that the STA does receive the AP signal in the corresponding Sector ID. The position of the bit map (0 to 7) corresponding to the sector ID. ***Insert the following new sub-clauses at the end of 8.5.23as the following:*****TGah editor: modify the D0.2 text from P117L40, as follows*** S1G Action frame details
* S1G Action field

Several Action frame formats are defined to support S1G functionality. A S1G Action field, in the octet immediately after the Category field, differentiates the S1G Action frame formats. The S1G Action field values associated with each frame format within the S1G category are defined in Table 8-295am (S1G Action field values).

|  |
| --- |
| * S1G Action field values
 |
| Value | Meaning | Time Priority |
| 0 | AID Switch Request | No |
| 1 | AID Switch Response | No |
| 2 | Synch Control | No |
| 3 | STA Information Announcement | No |
| 4 | EDCA Parameters Set |  |
| 5 | Activity Specification |  |
| 6 | TWT Setup |  |
| 7 | Group ID List |  |
| 8 | Sector ID Feedback |  |
| 9 – 255  | Reserved |  |

 |
| 427 | Minho Cheong | 9.32m | 150 | 14 | It is unclear how we can separate Type 0 and Type 1, whether it is possible to Type 0 and Type 1 at the same time if there is any need | as in the comment | REVISE. Refer to Doc. 13/1120r0. |
| 684 | Ronald Murias | 9.32m.1.1 | 150 | 55 | What is "sectorization rotation cycle"?Searched entire 11ah/D0.1 doc, only one occurrence. Is it the same as "Period" in Figure 8-401cv? | define what is a sectorization rotation cycle. | Refer to Doc. 13/1120r0. |
| <Discussion>Regarding CID 427, this issue is already covered by resolution to CID 202. (Please refer to 11-13-1098-00-00ah-cc9-resolution-of-cid-201and-202)As CID 202 pointed out, merging the two types of sectorization operation simplifies the operation. In the resolution of CID 202, Type 0 is renamed group sectorization operation and Type 1 is renamed for TXOP-based sectorization operation. Most of the burden of the sectorization operation rests on the (Sectorized Beam-Capable) AP. Sectorized Beam-Capable APs can optionally operate one type of sectorization operation or both types while Sectorized Beam-Capable STAs support both types of sectorization operation. This would ensure Sectorized Beam-Capable STAs to interoperate with all Sectorized Beam-Capable APs.Please refer to the S1G Capabilities element modified by resolution to CID 202 as follows:

|  |  |  |
| --- | --- | --- |
| STA Sectorized Beam Capable | indicate whether the STA supports the sectorized operation | Set to 0 if not supported,Set to 1 if supportedWhen set to 1, a STA shall support both group sectorization and TXOP-based sectorization operation |
| AP Sectorized Beam-Capable | indicate which type of sectorization operation is supported by AP | Set to 0 if sectorization operation is not supported,Set to 1 if only TXOP-based sectorization operation is supported,Set to 2 if only group sectorization operation is supported,Set to 3 if both group sectorization and TXOP-based sectorization operations are supported, |

Regarding CID 684, because the period sub-field in the Sectorization element (if group sectorization) means the time interval expressed in time units equal to 10 milliseconds each until the next transmission of the same Sector ID, it may be better to change into “period for the current sector”.**TGah editor: modify the D0.2 text from P167L32, as follows**(FYI, red colored ones were resolution to CID 202)* Sector Capabilities Exchange

A sectorized beam-capable STA shall exchange its S1G~~ector~~ Capabilities element with an AP. After the STA associated with a sectorized beam-capable AP, the AP can transmit through its sectorized beam to a sectorized beam-capable STA.If dot11S1GSectorImplemented is true, an STA shall set the STA S~~s~~ectorized B~~b~~eam-C~~c~~apable field in the S1G~~ector~~ Capabilities element to 1 in the Association Request Frame. The sectorized beam-capable STA shall support both group sectorization and TXOP-based sectorization operations. If dot11S1GSectorImplemented is false, the STA shall set the STA S~~s~~ectorized B~~b~~eam-C~~c~~apable field in the S1G~~ector~~ Capabilities element to 0. If dot11S1GSectorImplemented is true, an AP shall set the AP S~~s~~ectorized B~~b~~eam-C~~c~~apable field in the S1G~~ector~~ Capabilities element ~~to 1 in the Association Response Frame. The AP also sets the Sectorization Type field~~ in accordance with whether it ~~is~~ supports group and/or TXOP-based sectorization operation in the Association Response Frame~~and indicates the total number of Sectors in the Sector Capabilities element~~. If dot11S1GSectorImplemented is false, the AP shall set the AP S~~s~~ectorized B~~b~~eam-C~~c~~apable field in the S1G~~ector~~ Capabilities element to 0. An AP is a sectorized beam-capable AP if it sets the AP S~~s~~ectorized B~~b~~eam-C~~c~~apable field to 1, 2, or 3.When the AP Sectorized Beam-Capable field is set to 3, group sectorization and TXOP-based sectorization may be optionally used at the same time if the AP intentds to apply TXOP-based sectorization during the omni-beacon interval or the sectorized beacon interval to STAs with the corresponding Sector ID. After the exchange of the S1G~~ector~~ Capabilities element during the Association, a sectorized beam-capable AP supporting group sectorization operation shall transmit Sector Operation element, with the Sectorization Type field sets to 0 to advertise the period for the current sector, , omni-directional indicator, current sector ID, and allowable group IDs, and the duration for the current sector ID in the Sector Operation element in a sectorized beacon to start a beacon interval. A sectorized beam-capable AP supporting of TXOP-based sectorization operation may transmit Sector Operation element with the Sectorization Type field sets to 1 to advertise if periodic sector training is on or off, its training period, and the remaining beacon interval to periodic training in the Sector Operation element in a beacon.A sectorized beam-capable AP may (re)assign a specific Sector ID to a sectorized beam-capable STA after the Association. A sectorized beam-capable STA may optionally send Sector ID feedback to its associated sectorized beam-capable AP. A sectorized beam-capable STA may optionally request Sector Training from its associated sectorized beam-capable AP. A sectorized beam-capable AP has at least two sectors. |
| 523 | Mitsuru Iwaoka | 6.3.7.2.2 | 11 | 5 | In MLME-ASSOCIATE.request, the "AID Request" parameter and the "Sector Capabilities" parameter are present only if dot11S1GOptionImplemented is true. | Add the following text at the end of Description of "AID Request" and "Sector Capabilities" accordingly.---The parameter is present if dot11S1GOptionImplemented is true; otherwise not present.The parameter is present if dot11S1GSectorImplemented is true; otherwise not present. | REVISE.Refer to Doc. 13/1120r0. |
| <Discussion>By resolution to CID 202 before, now Sector Capabilities is located in S1G Capabilites. So, MLME (clause 6) and management frame format (clause 8) need to be modified accordingly. **TGah editor: modify the D0.2 text from P010L24, as follows*** MLME-ASSOCIATE.request
* Semantics of the service primitive

***Modify the primitive parameters by inserting the following text*** ***:***The primitive parameters are as follows:MLME-ASSOCIATE.request(PeerSTAAddress,AssociateFailureTimeout,CapabilityInformation,ListenInterval,Supported Channels,RSN,QoSCapability,Content of FT Authentication elements,SupportedOperatingClasses,HT Capabilities,Extended Capabilities,20/40 BSS Coexistence, QoSTrafficCapability,TIMBroadcastRequest,EmergencyServices,AID Request,S1G Capabilities,TWT,(#395,396,524)VendorSpecificInfo)

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Valid range** | **Description** |
|  |  |  |  |
| AID Request | AID Request element | As defined in 8.4.2.170d (AID Request element) | Indicate the device characteristic of the non-AP STA requesting AID assignment. |
| S1G Capabilities | As defined in frame format | As defined in 8.4.2.170k (S1G Capabilities element) | Specifies the parameters in the S1G Capabilities element that are supported by the STA. The parameter is present if dot11S1GOptionImplemented is true and not present otherwise. |
| TWT(#395,396,524) | Target Wake Time element | As defined in 8.4.2.170j (Target Wake Time element) The TWT Request field is set to 1, and the TWT Command field has a value of Request TWT, Suggest TWT or Demand TWT. | Specifies the parameters in the Target Wake Time element.This parameter is optionally present if dot11TWTOptionActivate is true. |

* MLME-ASSOCIATE.confirm
* Semantics of the service primitive

***Modify the primitive parameters by inserting the following text*** ***:***The primitive parameters are as follows:MLME-ASSOCIATE.confirm(ResultCode,CapabilityInformation,AssociationID,ListenInterval,SupportedRates,EDCAParameterSet,RCPI.request,RSNI.request,RCPI.response,RSNI.response,RMEnabledCapabilities,Content of FT Authentication elements,SupportedOperatingClasses,HT Capabilities,Extended Capabilities,20/40 BSS Coexistence, TimeoutInterval,BSSMaxIdlePeriod,TIMBroadcastResponse,QosMapSet,QMFPolicy,(11ae)Sector Operation,S1G Capabilities,AID Response,TSF Timer Accuracy,(#401)TWT,(#395,396,524)VendorSpecificInfo)

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Valid range** | **Description** |
| AssociationID | Integer | 1-2007 inclusive | If the association request result was SUCCESS, then AssociationID specifies the association ID value assigned by the PCP/AP.This parameter is not present if dot11S1GOptionImpemented is true.(#525) |
| Listen Interval | Integer | ≥ 0 | Specifies the value of listen interval different from that in Association Request frame based on AP's buffer management consideration. |
| Sector Operation | Sector Operation element | As defined in 8.4.2.170f (Sector Operation element) | Specifies the sectorization sheme, period, subperiod sector intervals, and sector training. |
|  |  |  |  |
| S1G Capabilities | As defined in frame format | As defined in 8.4.2.170k (S1G Capabilities element) | Specifies the parameters in the S1G Capabilities element that are supported by the AP. The parameter is present if dot11S1GOptionImplemented is true and the S1G Capabilities element is present in the Association Response frame received from the AP, and not present otherwise. |
| AID Response | AID Response element | As defined in 8.4.2.170e (AID Response element) | Parameters describing an AID assignment.This parameter is present if dot11S1GOptionImpemented is true; otherwise not present.(#624) |
| TSF Timer Accuracy(#401) | TSF Timer Accuracy element | As defined in 8.4.2.170o (TSF Timer Accuracy element) | Indicate the information about the TSF Timer Accuracy. |
| TWT(#395,396,524) | Target Wake Time element | As defined in 8.4.2.170j (Target Wake Time element) The TWT Request field is set to 1, and the TWT Command field has a value of Request TWT, Suggest TWT or Demand TWT. | Specifies the parameters in the Target Wake Time element.This parameter is optionally present if dot11TWTOptionActivate is true. |

* MLME-ASSOCIATE.indication
* Semantics of the service primitive

***Modify the primitive parameters by inserting the following text*** ***:***The primitive parameters are as follows:MLME-ASSOCIATE.indication(PeerSTAAddress,CapabilityInformation,ListenInterval,SSID,SupportedRates,RSN,QoSCapability,RCPI,RSNI,RMEnabledCapabilities,Content of FT Authentication elements,SupportedOperatingClasses,DSERegisteredLocation,HT Capabilities,Extended Capabilities,20/40 BSS Coexistence,QoSTrafficCapability,TIMBroadcastRequest,EmergencyServices,AID Request,S1G Capabilities,TWT,(#395,396,524)VendorSpecificInfo)

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Valid range** | **Description** |
|  |  |  |  |
| AID Request | AID Request element | As defined in 8.4.2.170d (AID Request element) | Indicate the device characteristic of the non-AP STA requesting AID assignment. |
| S1G Capabilities | As defined in frame format | As defined in 8.4.2.170k (S1G Capabilities element) | Specifies the parameters in the S1G Capabilities element that are supported by the STA. The parameter is present ifdot11S1GOptionImplemented is true and the S1G Capabilities element is present in the Association Request frame received from the STA, and not present otherwise. |
| TWT(#395,396,524) | Target Wake Time element | As defined in 8.4.2.170j (Target Wake Time element) The TWT Request field is set to 1, and the TWT Command field has a value of Request TWT, Suggest TWT or Demand TWT. | Specifies the parameters in the Target Wake Time element.This parameter is optionally present if dot11TWTOptionActivate is true. |

* MLME-ASSOCIATE.response
* Semantics of the service primitive

***Modify the primitive parameters by inserting the following text*** ***:***The primitive parameters are as follows:MLME-ASSOCIATE.response(PeerSTAAddress,ResultCode,CapabilityInformation,AssociationID,ListenInterval,EDCAParameterSet,RCPI,RSNI,RMEnabledCapabilities,Content of FT Authentication elements,SupportedOperatingClasses,DSERegisteredLocation,HTCapabilities,Extended Capabilities,20/40 BSS Coexistence, TimeoutInterval,BSSMaxIdlePeriod,TIMBroadcastResponse,QoSMapSet,QMFPolicy,(11ae)Sector Operation,S1G Capabilities,AID Response,TSF Timer Accuracy,(#401)TWT,(#395,396,524)VendorSpecificInfo)

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Valid range** | **Description** |
| AssociationID | Integer | 1-2007 inclusive | If the association request result was SUCCESS, then AssociationID specifies the association ID value assigned by the PCP/AP.This parameter is not present if dot11S1GOptionImpemented is true.(#525) |
| Listen Interval | Integer | ≥ 0 | Specifies the value of listen interval different from that in Association Request frame based on AP's buffer management consideration. |
| Sector Operation | Sector Operation element | As defined in 8.4.2.170f (Sector Operation element) | Specifies the sectorization scheme, period, subperiod sector intervals, sector training. |
|  |  |  |  |
| S1G Capabilities | As defined in frame format | As defined in 8.4.2.170k (S1G Capabilities element) | Specifies the parameters in the S1G Capabilities element that are supported by the STA. The parameter is present if dot11S1GOptionImplemented is true and not present otherwise. |
| AID Response | AID Response element | As defined in 8.4.2.170e (AID Response element) | Parameters describing an AID assignment.This parameter is present if dot11S1GOptionImpemented is true; otherwise not present.(#624) |
| TSF Timer Accuracy(#401) | TSF Timer Accuracy element | As defined in 8.4.2.170o (TSF Timer Accuracy element) | Indicate the information about the TSF Timer Accuracy. |
| TWT(#395,396,524) | Target Wake Time element | As defined in 8.4.2.170j (Target Wake Time element) The TWT Request field is set to 1, and the TWT Command field has a value of Request TWT, Suggest TWT or Demand TWT. | Specifies the parameters in the Target Wake Time element.This parameter is optionally present if dot11TWTOptionActivate is true. |

* Reassociate
* MLME-REASSOCIATE.request
* Semantics of the service primitive

The primitive parameters are as follows:MLME-REASSOCIATE.request(NewAPAddress,ReassociateFailureTimeout,CapabilityInformation,ListenInterval,Supported ChannelsRSN,QoSCapability,Content of FT Authentication elements,SupportedOperatingClasses,HT Capabilities,Extended Capabilities,20/40 BSS Coexistence, QoSTrafficCapability,TIMBroadcastRequest,FMSRequest,DMSRequest,EmergencyServices,AID Request,S1G Capabilities,TWT,(#399,400)VendorSpecificInfo)

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Valid range** | **Description** |
|  |  |  |  |
| AID Request | AID Request element | As defined in 8.4.2.170d (AID Request element) | Indicate the device characteristic of the non-AP STA requesting AID assignment. |
| S1G Capabilities | As defined in frame format | As defined in 8.4.2.170k (S1G Capabilities element) | Specifies the parameters in the S1G Capabilities element that are supported by the STA. The parameter is present if dot11S1GOptionImplemented is true and not present otherwise. |
| TWT(#399,400,524) | Target Wake Time element | As defined in 8.4.2.170j (Target Wake Time element) The TWT Request field is set to 1, and the TWT Command field has a value of Request TWT, Suggest TWT or Demand TWT. | Specifies the parameters in the Target Wake Time element.This parameter is optionally present if dot11TWTOptionActivate is true. |

* MLME-REASSOCIATE.confirm
* Semantics of the service primitive

***Modify the primitive parameters by inserting the following text*** ***:***The primitive parameters are as follows:MLME-REASSOCIATE.confirm(ResultCode,CapabilityInformation,AssociationID,ListenInterval,SupportedRates,EDCAParameterSet,RCPI.request,RSNI.request,RCPI.response,RSNI.response,RMEnabledCapabilities,Content of FT Authentication elements,SupportedOperatingClasses,HT Capabilities,Extended Capabilities,20/40 BSS Coexistence, TimeoutInterval,BSSMaxIdlePeriod,TIMBroadcastResponse,FMSRespone,DMSResponse,QoSMapSet,QMFPolicy,(11ae)Sector Operation,S1G Capabilities,AID Response,TSF Timer Accuracy,(#401)TWT,(#399,400,524)VendorSpecificInfo)

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Valid range** | **Description** |
| AssociationID | Integer | 1-2007 inclusive | If the association request result was SUCCESS, then AssociationID specifies the association ID value assigned by the PCP/AP.This parameter is not present if dot11S1GOptionImpemented is true.(#525) |
| Listen Interval | Integer | ≥ 0 | Specifies the value of listen interval different from that in Association Request frame based on AP's buffer management consideration. |
| Sector Operation | Sector Operation element | As defined in 8.4.2.170f (Sector Operation element) | Specifies the sectorization scheme, period, subperiod sector intervals, sector training. |
|  |  |  |  |
| S1G Capabilities | As defined in frame format | As defined in 8.4.2.170k (S1G Capabilities element) | Specifies the parameters in the S1G Capabilities element that are supported by the AP. The parameter is present if dot11S1GOptionImplemented is true and the S1G Capabilities element is present in the Reassociation Response frame received from the AP, and not present otherwise. |
| AID Response | AID Response element | As defined in 8.4.2.170e (AID Response element) | Parameters describing an AID assignment.This parameter is present if dot11S1GOptionImpemented is true; otherwise not present.(#624) |
| TSF Timer Accuracy(#401) | TSF Timer Accuracy element | As defined in 8.4.2.170o (TSF Timer Accuracy element) | Indicate the information about the TSF Timer Accuracy. |
| TWT(#399,400,524) | Target Wake Time element | As defined in 8.4.2.170j (Target Wake Time element) The TWT Request field is set to 1, and the TWT Command field has a value of Request TWT, Suggest TWT or Demand TWT. | Specifies the parameters in the Target Wake Time element.This parameter is optionally present if dot11TWTOptionActivate is true. |

* MLME-REASSOCIATE.indication
* Semantics of the service primitive

***Modify the primitive parameters by inserting the following text*** ***:***The primitive parameters are as follows:MLME-REASSOCIATE.indication(PeerSTAAddress,CurrentAPAddress,CapabilityInformation,ListenInterval,SSID,SupportedRates,RSN,QoSCapability,RCPI,RSNI,RMEnabledCapabilities,Content of FT Authentication elements,SupportedOperatingClasses,DSERegisteredLocation,HT Capabilities,Extended Capabilities,20/40 BSS Coexistence, QoSTrafficCapability,TIMBroadcastRequest,FMSRequest,DMSRequest,EmergencyServices,AID Request,S1G Capabilities,TWT,(#399,400,524)VendorSpecificInfo)

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Valid range** | **Description** |
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| AID Request | AID Request element | As defined in 8.4.2.170d (AID Request element) | Indicate the device characteristic of the non-AP STA requesting AID assignment. |
| S1G Capabilities | As defined in frame format | As defined in 8.4.2.170k (S1G Capabilities element) | Specifies the parameters in the S1G Capabilities element that are supported by the STA. The parameter is present ifdot11S1GOptionImplemented is true and the S1G Capabilities element is present in the Reassociation Request frame received from the STA, and not present otherwise. |
| TWT(#399,400,524) | Target Wake Time element | As defined in 8.4.2.170j (Target Wake Time element) The TWT Request field is set to 1, and the TWT Command field has a value of Request TWT, Suggest TWT or Demand TWT. | Specifies the parameters in the Target Wake Time element.This parameter is optionally present if dot11TWTOptionActivate is true. |

* MLME-REASSOCIATE.response
* Semantics of the service primitive

***Modify the primitive parameters by inserting the following text*** ***:***The primitive parameters are as follows:MLME-REASSOCIATE.response( PeerSTAAddress,ResultCode,CapabilityInformation,AssociationID,ListenInterval,EDCAParameterSet,RCPI,RSNI,RMEnabledCapabilities,Content of FT Authentication elements,SupportedOperatingClasses,DSERegisteredLocation,HT Capabilities,Extended Capabilities,20/40 BSS Coexistence, TimeoutInterval,BSSMaxIdlePeriod,TIMBroadcastResponse,FMSResponse,DMSResponse,QoSMapSet,Sector Operation,S1G Capabilities,AID Response,TSF Timer Accuracy,(#401)TWT,(#399,400,524)VendorSpecificInfo)

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Type** | **Valid range** | **Description** |
| AssociationID | Integer | 1-2007 inclusive | If the association request result was SUCCESS, then AssociationID specifies the association ID value assigned by the PCP/AP.This parameter is not present if dot11S1GOptionImpemented is true.(#525) |
| Listen Interval | Integer | ≥ 0 | Specifies the value of listen interval different from that in Association Request frame based on AP's buffer management consideration. |
| Sector Operation | Sector Operation element | As defined in 8.4.2.170f (Sector Operation element) | Specifies the sectorization scheme, period, subperiod sector intervals, and sector training. |
|  |  |  |  |
| S1G Capabilities | As defined in frame format | As defined in 8.4.2.170k (S1G Capabilities element) | Specifies the parameters in the S1G Capabilities element that are supported by the STA. The parameter is present if dot11S1GOptionImplemented is true and not present otherwise. |
| AID Response | AID Response element | As defined in 8.4.2.170e (AID Response element) | Parameters describing an AID assignment.This parameter is present if dot11S1GOptionImpemented is true; otherwise not present.(#624) |
| TSF Timer Accuracy(#401) | TSF Timer Accuracy element | As defined in 8.4.2.170o (TSF Timer Accuracy element) | Indicate the information about the TSF Timer Accuracy. |
| TWT(#399,400,524) | Target Wake Time element | As defined in 8.4.2.170j (Target Wake Time element) The TWT Request field is set to 1, and the TWT Command field has a value of Request TWT, Suggest TWT or Demand TWT. | Specifies the parameters in the Target Wake Time element.This parameter is optionally present if dot11TWTOptionActivate is true. |

**TGah editor: modify the D0.2 text from P040L45, as follows*** Association Request frame format
* Changes based on 802.11REVmc D1.1

***Modify Table 8-26 in Clause 8.3.3.5 by inserting the following rows******:***

|  |
| --- |
| * Association Request frame body
 |
| **Order** | **Information** | **Notes**  |
| TBD | TWT | The Target Wake Time element is optionally present if dot11TargetWakeTimeOptionImplemented is true. |
|  |  |  |
| TBD | AID Request | The AID Request element is optionally present if dot11S1GOptionImplemented is true.  |
| TBD | S1G Capabilities | S1G Capabilities element is optionally present if dot11S1GOptionImplemented is true. |

* Association Response frame format
* Changes based on 802.11REVmc D1.1

***Change the row of Order 3 and Order 13 in Table 8-27 Association Response frame body as the following:***

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| 3 | AID | This field is not present when the dot11S1GOptionImpemented is true. |
| 13 | Timeout Interval (Association Comeback time) | A Timeout Interval element (TIE) containing the Association Comeback time is present when dot11RSNAActivated is true, dot11RSNAProtectedManagementFramesActivated is true, and either the association request is rejected with a status code 30 or the association request is accepted with a status code 0. |

***Modify Table 8-27 in Clause 8.3.3.6 by inserting the following rows******:***

|  |
| --- |
| * Association Response frame body
 |
| **Order** | **Information** | **Notes**  |
| TBD | Sector Operation | The AP provides via this element the information related to the sector duration and sector periodicity or Sector Training when dot11S1GSectorizationActivated is true.  |
| TBD | TWT | The Target Wake Time element is present if dot11TargetWakeTimeOptionImplemented is true and the Target Wake Time element is present in the Association Request frame that elicited this Association Response frame. |
|  |  |  |
| TBD | TSF Timer Accuracy | The TSF Timer Accuracy element is optionally present when the dot11TSFTimerAccuracyImpemented is true.  |
| TBD | S1G Capabilities | S1G Capabilities element is optionally present if dot11S1GOptionImplemented is true. |
| TBD | AID Response | The AID Response element is present when the dot11S1GOptionImpemented is true.  |
| TBD | Group ID List | A Group ID List is added when the dot11S1GSectorizationActivated is true and indicates new membership groups for a receiving STA |

* Reassociation Request frame format
* Changes based on 802.11REVmc D1.1

***Change the row of Order 15 in Table 8-28 Association Response frame body as the following:***

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| 15 | Timeout Interval (Association Comeback time) | A TIE containing the Association Comeback time is present when dot11RSNAActivated is true, dot11RSNAProtectedManagementFramesActivated is true, and either the reassociation is rejected with status code 30 or the reassociation request is accepted with a status code 0. |

***Modify Table 8-28 in Clause 8.3.3.7 by inserting the following rows******:***

|  |
| --- |
| * Reassociation Request frame body
 |
| **Order** | **Information** | **Notes**  |
| TBD | TWT | The Target Wake Time element is optionally present if dot11TargetWakeTimeOptionImplemented is true. |
|  |  |  |
| TBD | AID Request | The AID Request element is present when the dot11S1GOptionImpemented is true.  |
| TBD | S1G Capabilities | S1G Capabilities element is optionally present if dot11S1GOptionImplemented is true. |

* Reassociation Response frame format
* Changes based on 802.11REVmc D1.1

***Change the row of Order 3 in Table 8-29 Reassociation Response frame body as the following:***

|  |  |  |
| --- | --- | --- |
| **Order** | **Information** | **Notes** |
| 3 | AID | This field is not present when the dot11S1GOptionImpemented is true. |

***Modify Table 8-29 in Clause 8.3.3.8 by inserting the following rows******:***

|  |
| --- |
| * Reassociation Response frame body
 |
| **Order** | **Information** | **Notes**  |
| TBD | Sector Operation | The AP provides via this element the information related to the sector duration and sector periodicity or sector Training when dot11S1GSectorizationActivated is true.  |
| TBD | TWT | The Target Wake Time element is present if dot11TargetWakeTimeOptionImplemented is true and the Target Wake Time element is present in the Reassociation Request frame that elicited this Reassociation Response frame. |
|  |  |  |
| TBD | TSF Timer Accuracy | The TSF Timer Accuracy element is optionally present when the dot11TSFTimerAccuracyImpemented is true.  |
| TBD | S1G Capabilities | The S1G Capabilities element is optionally present if dot11S1GOptionImplemented is true. |
| TBD | AID Response | The AID Response element is present when the dot11S1GOptionImpemented is true.  |

* Probe Request frame format

***Modify Table 8-30 in Clause 8.3.3.9 by inserting the following rows******:***

|  |
| --- |
| * Probe Request frame body
 |
| **Order** | **Information** | **Notes**  |
| TBD | Change Sequence | The Change Sequence is optionally present if dot11ShortBeaconOptionImplemented is true. |
| TBD | Relay Discovery | The Relay Discovery is optionally present if TBD is true. |
| TBD | ProbeResponseOption | The ProbeResponseOption is optionally present if dot11S1GOptionImplemented is true.  |
| TBD | S1G Capabilities | S1G Capabilities element is optionally present if dot11S1GOptionImplemented is true. |

* Probe Response frame format

***Modify Table 8-31 in Clause 8.3.3.10 by inserting the following rows******:***

|  |
| --- |
| * Probe Response frame body
 |
| **Order** | **Information** | **Notes** |
| TBD | RPS | The RPS element is present only within Probe Response frames generated by APs for medium access of STAs. |
| TBD | Segment Count | The Segment Count element is used for indication of TIM and page segments present in DTIM intervals. |
| TBD | ProbeResponseOption | The ProbeResponseOption element is optionally present if dot11S1GOptionImplemented is true.  |
| TBD | Change Sequence | The Change Sequence is optionally present if dot11ShortBeaconOptionImplemented is true. |
| TBD | TSF Timer Accuracy | The TSF Timer Accuracy element is optionally present when the dot11TSFTimerAccuracyImpemented is true.  |
| TBD | Relay Discovery | The Relay Discovery is optionally present if TBD is true. |
| TBD | Relay | The Relay element is optionally present if dot11RelayCapable is true. |
| TBD | S1G Capabilities | S1G Capabilities element is optionally present if dot11S1GOptionImplemented is true. |
| TBD | S1G Operation(#863,866) | The S1G Operation element is optionally present when the dot11S1GOptionImpemented is true. |

 |
| 791 | Shusaku Shimada | 8.4.2.170l | 94 | 13 | SST combinatory usage with Type 0 sectorization has to be defined. | SST combination has to be introduced and appended. | REJECT.Refer to Doc. 13/1120r0. |
| <Discussion>SST operation and group sectorization (formerly names as Type 0 sectorization) operation are quite orthogonal to each other. SST operation performes the frequency-domain reuse with the use of SST element while group sectoration performs the spatial-domain reuse with the use of sectorization element. So, there seems no need to explicitly mention its combo-use in the draft. **TGah editor: No change** |
| 793 | Shusaku Shimada | 9.32m.4.4 | 158 | 11 | Non TIM STA may not be aware of Sector Report RAW but fast sector discovery may be needed by non TIM STAs. | Other means than real sector discovery but to assign Group ID to non TIM STAs in locaton based may be desirable. | REJECT. Refer to Doc. 13/1120r0. |
| <Discussion>Sectorization operation element is included in the beacon, which is crucial for sector operation. So, it’s unlikely that an STA performes sectorization without decoding of RPS I.E in any beacon. If a non-TIM STA wants to operate in sectorization, it needs to check the RPS by short probe response or delayed check on short beacon by which it also can get to know about Sector Report RAW (and Sector Sounding RAW) scheduled. In addition, fast sector discovery is a useful feature whenever there are multiple (TIM) STAs which want to know its best sector fastly at the same time. **TGah editor: No change** |
| 652 | Ronald Murias | 8.4.2.170l | 93 | 62 | "else" needs to be clarified. | In line 62 page 93, change "else" to the following text:if neither Type 0 Sectorization nor Type 1 Sectorization is supported. | REVISE. Refer to Doc. 13/1120r0. |
| 850 | Timo Koskela | 8.4.2.170l Sector Capabilities element | 93 | 62 | reads "else" as a fourth option | should be "reserved" | Refer to Doc. 13/1120r0. |
| 653 | Ronald Murias | 8.4.2.170l | 93 | 48 | The length field of the Sector Capabilities element shall be specified. | Make the following changes:1). Add the following text in "Definition" column of the "Length" row in Table 8-191e:"indicates the number of octets in the Information fields after the Lenght field"2). add the following text in "Encoding" column of the "Length" row in Table 8-191e:"set to 1."3)Delete the last row in Table 8-191e, i.e., the Reserved row in line 13 page 94. | REVISE. Refer to Doc. 13/1120r0. |
| 654 | Ronald Murias | 8.4.2.170l | 93 | 41 | The convention of 802.11 element specification is in the format of a figure, not in a table. In order to keep consistent, the Sector Capabilityies element should be also specified in Figure. | Change Table 8-191e into a figure format. | REVISE. Refer to Doc. 13/1120r0. |
| <Discussion>As I mentioned in the above, the Sector Capabilites element is now merged into the S1G Capabilities element by resolution to CID 202. FYI, element ID sub-field and length sub-field of the S1G Capabilites element are already well-defined in the figure and table as well. (Please refer to “11-13-1098-00-00ah-cc9-resolution-of-cid-201and-202”)**TGah editor: resolution to CID 202 already covers resolution to these CIDs.** |
| 683 | Ronald Murias | 9.32m.1.1 | 150 | 53 | What's a Type 0 Sectorization Scheme element? What's a Type 1 Sectorization Scheme element?Searched entire 11ah/D0.1 doc, they only occur in the paragarph in line 52 page 150. | Propose three options:Option-1: Define Type 0 Sectorization Scheme element and Type 1 Sectorization Scheme element.Option-2: Delete the paragraph in line 52 on page 150.Option-3:-- replace "Type 0 Sectorization Scheme element" by "Sector Operation element with Sectorization Type 0"; and-- replace "Type 1 Sectorization Scheme element" by "Sector Operation element with Sectorization Type 1". | REVISE. Refer to Doc. 13/1120r0. |
| <Discussion>I agree with what the commenter pointed out. As I mentioned in the above, this also is resolved by resolution to CID 202 which describes the Sector Operation Element if sectorization type is group sectorzation and the Sector operation Element if sectorization type is TXOP-based sectorization. It is almost same as what the commenter suggested as option 3. (Please refer to “11-13-1098-00-00ah-cc9-resolution-of-cid-201and-202”)**TGah editor: resolution to CID 202 already covers resolution to this CID.** |