IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Resolution to 11ay related CIDs | | | | |
| Date: 2017-09-12 | | | | |
| Author(s): | | | | |
| Name | Company | Address | Phone | email |
| Cheng Chen | Intel |  |  | cheng.chen@intel.com |

Abstract

This submission proposes a resolution to several CIDs submitted on the 11ay draft text. These CIDs include: 179, 266, 314, 355, 384, 455, 491, 494, and 541.

The discussion is in reference to Draft IEEE P802.11ay/D0.3.

|  |  |  |  |
| --- | --- | --- | --- |
| CID | Clause | Comment | Proposed change |
| 179 | 9.4.2.252 | The Receive Direction subfield is defined to contain information about the antennas that will be used for reception. Within the extended schedule there is already a bf control field with enough bits to define the sector id. It may free up space to allow e.g., link budget related parameters to be included with the allocation. | study if suggestion is applicable |

**Discussion**: The directional allocation which specifies the Receive Direction subfield can also be used for further beamforming training or refinement between the PCP/AP and the STA. As a result, the AP may need to use the BF Control field within the extended schedule element when it schedules a directional allocation. Considering there are only 4 or 6 reserved bits (depending on the format of the BF Control field), it is not possible to put the Receive Direction subfield in the BF control field.

**Proposed resolution**: Rejected

|  |  |  |  |
| --- | --- | --- | --- |
| CID | Clause | Comment | Proposed change |
| 266 | 9.4.2.132 | The Extended Schedule Element does not contain the channel (BW) allocation | Add the corresponding fields to Schedule element |

**Discussion:** The BW information is included in the BW subfield in the Channel Allocation field, as indicated in Figure 36 and Figure 39.

**Proposed resolution:** Rejected.

|  |  |  |  |
| --- | --- | --- | --- |
| CID | Clause | Comment | Proposed change |
| 314 | 9.4.2.53 | Inserting non-EDMG STA in front of the New Channel Number field, breaks the specification, as non-EDMG STA is defined as DMG that is not EDMG. But this clause and requirement is for all 802.11 STAs not just DMG. If the EDMG STA requirement for the new number to be the primary channel, it should be provided in Annex E or in the MAC sections where the use of New Channel Number for DMG and EDMG is described, there is no need to add a behavior requirement in clause 9. | Remove all changes to this paragraph. Write any behavior requirements elsewhere in the appropriate MAC section or annex. |

**Discussion**:

1. For an EDMG STA, it is possible that it switches to a bonded channel. As a result, it is necessary to describe the behavior that the New Channel Number field is set to the channel number of the primary channel.
2. However, currently the primary channel number along with the operating class is not able to uniquely identify a bonded channel. Therefore, we may also need to do some changes in Annex E.
3. This comment (CID 314) resolution is also related to the changes proposed in response to CID 455.

**Proposed resolution:** Revised.

|  |  |  |  |
| --- | --- | --- | --- |
| CID | Clause | Comment | Proposed change |
| 355 | 10.36.11.2 | Further clarification on the Channel Allocation field with the Scheduling Type subfield is required. | change the second paragraph in P56 to  "If an EDMG Extended Schedule element that has at least one Channel Allocation field with the Scheduling Type subfield equal to 0 present in a transmitted frame, an Extended Schedule element shall also be present in the same frame. The Allocation Key subfield of a Channel Allocation field with the Scheduling Type subfield equal to 0 shall have its contents matched to the tuple<Source AID, Destination AID, Allocation ID> of an Allocation field in the Extended Schedule element for the same allocation. A Channel Allocation field with the Scheduling Type subfield equal to 0 included in the EDMG Extended Schedule element shall be ignored if the contents of its Allocation Key subfield do not match to the tuple<Source AID, Destination AID, Allocation ID> of any Allocation field in the Extended Schedule element." |

**Proposed resolution:** Accepted

|  |  |  |  |
| --- | --- | --- | --- |
| CID | Clause | Comment | Proposed change |
| 384 | 10.36.11.3 | source AID is the STA initiates the frame exchange in a SP. Here AP is receiving so the STA is identified by the source AID | change Destination AID to source AID in L20, 22, 23 |

**Discussion:**

1. A directional allocation is an allocation where the PCP or AP will use directional antenna configuration for receiving, where either the PCP/AP or the STA initiates the frame exchange. In other words, the PCP or AP can still initiate the frame exchange in a directional allocation where it will use a directional receiving configuration. The first sentence already covers this behaviour, there is no need to further divide this behaviour depending on the different values of Destination/Source AID.
2. The third paragraph already indicates the channel access rules for a directional allocation is the same as the SP or CBAP, depending on the type of the allocation.
3. This comment (CID 384) resolution also applies to CID 491 and CID 541.

**Proposed resolution:** Revised.

*Change the second paragraph in 10.36.11.3 as follows:*

The Sector ID and DMG Antenna ID subfields of a ~~direcitonal~~ directional allocation shall be set to the sector and DMG antenna, respectively, that the PCP or AP uses to receive frames during the entire allocation. ~~If the Destination AID field of the allocation is not the broadcast AID, the Sector ID and DMG Antenna ID subfields of the allocation shall be set to indicate the sector and DMG antenna that are to be used during the allocation for communication with the STA identified by the Destination AID field. Otherwise if the Destination AID field of the allocation is the broadcast AID, the PCP or AP may choose any antenna confiuration for communication during the allocation and shall indicate the configuration through the Sector ID and DMG Antenna ID subfields.~~ A non-PCP and non-AP EDMG STA receiving such allocation shall stay awake during the allocation if the value of the Sector ID and DMG Antenna ID subfields identified in the allocation correspond to a sector and DMG antenna reported by the STA to the PCP or AP in the last beamforming feedback to the PCP or AP, respectively.

|  |  |  |  |
| --- | --- | --- | --- |
| CID | Clause | Comment | Proposed change |
| 455 |  | Wrong definition: "If transmitted by an EDMG STA, the New Channel Number field is set to the channel number of the primary channel after the channel switch. The channel number is a channel from the STA's new operating class as defined in Annex E." In EDMG operating class does not identify the primary channel despite .11n there the same channel number applies to different operating classes and the operating class uniquely identifies the primary channel. In EDMG tables of Annex E, operating class defines channel width, channel number defines channel width and the channel central frequency. Actually operating class does not provide any addition to channel number. Thus the EDMG operating class does not provide information about primary channel. | Few options are relevant:  1. Add additional field of primary channel to the Extended Channel Switch Announcement element  2. Define operating class to indicate primary channel for each channel width. It actually means to have 1, 2, 3, and 4 operating classes respectively to channel width for each channel number.  May need submission to agree |

Discussion:

1. In 11n/11ac, for 40MHz channel, the operating class is defined in a way that the field of “Behavior limits set” will identify the primary channel. Specifically, if the field contains “PrimaryChannelLowerBehavior”, it means the primary channel is the lower 20MHz one. In contrast, if it contains “PrimaryChannelUpperBehavior”, it means the primary channel is the upper 20MHz one.
2. The easiest way to resolve this issue is to redefine the operating classes such that once the primary channel number is conveyed in the New Channel Number subfield, the bonded channel number can be uniquely determined in the associated operating class.
3. This comment (CID 455) resolution also applies to CID 314.

Proposed resolution: Revised

*Change Annex E as follows:*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 35 | 181 | 56.16 | 4320 | 9,11,13 | - | - |
| 36 | 182 | 56.16 | 4320 | 10,12 |  |  |
| 37 | 183 | 56.16 | 6480 | 17,20 | - | - |
| 38 | 184 | 56.16 | 6480 | 18 |  |  |
| 39 | 185 | 56.16 | 6480 | 19 |  |  |
| 40 | 186 | 56.16 | 8640 | 25 |  |  |
| 41 | 187 | 56.16 | 8640 | 26 |  |  |
| 42 | 188 | 56.16 | 8640 | 27 |  |  |
| ~~35~~43-127 | Reserved | Reserved | Reserved | Reserved | Reserved | Reserved |

*Change Table E-1 as follows*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 19 | 181 | 56.16 | 4320 | 9, 11 | - | - |
| 20 | 182 | 56.16 | 4320 | 10 |  |  |
| 21 | 183 | 56.16 | 6480 | 17 | - | - |
| 22 | 184 | 56.16 | 6480 | 18 | - | - |
| 23 | 185 | 56.16 | 8640 | 25 |  |  |
| ~~19~~24-127 | Reserved | Reserved | Reserved | Reserved | Reserved | Reserved |

*Change Table E-2 as follows*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 60 | 181 | 56.16 | 4320 | 9, 11 | - | - |
| 61 | 182 | 56.16 | 4320 | 10 | - | - |
| 62 | 183 | 56.16 | 6480 | 17 | - | - |
| 63 | 184 | 56.16 | 6480 | 18 | - | - |
| 64 | 185 | 56.16 | 8640 | 25 |  |  |
| ~~60~~65-127 | Reserved | Reserved | Reserved | Reserved | Reserved | Reserved |

*Change Table E-3 as follows*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 181 | E-1-35,  E-2-19,  E-3-60 | 56.16 | 4320 | 9, 11, 13 | - | - |
| 182 | E-1-36,  E-2-20,  E-3-61 | 56.16 | 4320 | 10, 12 | - | - |
| 183 | E-1-37,  E-2-21,  E-3-62 | 56.16 | 6480 | 17, 20 | - | - |
| 184 | E-1-38,  E-2-21,  E-3-63 | 56.16 | 6480 | 18 | - | - |
| 185 | E-1-39,  E-2-22,  E-3-64 | 56.16 | 6480 | 19 | - | - |
| 186 | E-1-40,  E-2-23,  E-3-65 | 56.16 | 8640 | 25 |  |  |
| 187 | E-1-41,  E-2-24,  E-3-66 | 56.16 | 8640 | 26 |  |  |
| 188 | E-1-42,  E-2-25,  E-3-67 | 56.16 | 8640 | 27 |  |  |
| ~~181~~189-191 | Reserved | Reserved | Reserved | Reserved | Reserved | Reserved |

|  |  |  |  |
| --- | --- | --- | --- |
| CID | Clause | Comment | Proposed change |
| 491 | 10.36.11.3 | It is not clear how/where the configuration of sector ID and DMG antenna ID is done when destination is equal to broadcast AID. It might be that several sector Ids and DMG antenna Ids need to be signaled. It might even be that sector Ids are unknown at the point of allocation announcement | Please clarify "... Shall indicate the configuration through Sector ID and DMG Antenna ID subfields". Which subfields? |

**Discussion:** This comment (CID 491) resolution is resolved with the changes proposed in response to CID 384.

**Proposed resolution:** Revised

|  |  |  |  |
| --- | --- | --- | --- |
| CID | Clause | Comment | Proposed change |
| 494 | 10.36.11.3 | Signaling for directional allocation is incomplete | Extended schedule element supports directional allocation only in "asymmetric beamforming training" mode |

**Discussion:** Directional allocation is not restricted to be used in asymmetric beamforming training only. In fact, it can be used in any transaction (such as data transmission) in DTI, as long as the AP or PCP will use a directional receiving mode in the allocation.

**Proposed resolution:** Rejected

|  |  |  |  |
| --- | --- | --- | --- |
| CID | Clause | Comment | Proposed change |
| 541 | 10.36.11.3 | This sentence only describes the scenario where the Destination AID is not the broadcast AID but a non-AP STA AID. The scenario where the Destination AID field is not the broadcast AID but an AP AID is not given | Suggest to change "communication with the STA identified by the Destination AID field" to " "communication with the non-PCP/non-AP STA" |

**Discussion**: This comment (CID 541) resolution is resolved with the changes proposed in response to CID 384.

**Proposed resolution**: Revised

**Straw Poll:**

* **Do you agree to accept comment resolutions as proposed in doc 11-17/1314r0?**