IEEE P802.11
Wireless LANs

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| (LB203) TGah D2.0 MAC Comment Resolutions on Group Sectorization  |
| Date: 2014-09-03 |
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This document provides resolutions for MAC CIDs on Group Sectorization.

CID 3372, 3576, 3622, 3625, 3626, 3647, 3722, 3723, 3724, 3733

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| **CID** | **Commenter** | **Clause Number(C)** | **Page(C)** | **Line(C)** | **Comment** | **Proposed Change** | **Resolution** |
| **3622** | **Jerome Henry** | **8.4.2.170e** | **134** | **21** | "by default all stations consider themselves as in grp 0". Some STAs may not support sectorization, and would not consider themselves in grp 0 | Specify that "STAs supporting sectorization consider themselves in grp 0 by default". | Revised |
| **3576** | **Hongyuan Zhang** | **9.48** | **293** | **51** | Why define two Sectorized Tx modes in parallel? Our experience with some optional 11n features proved that multiple modes of the same feature will eventually kill this feature, because of interop issues. | Merge the two sectorization modes into one mode | Reject.  |
| **3722** | **Liwen Chu** | **8.4.2.170e** | **133** | **1** | How can you indicate Period in Beacon Intervals when Period is in units of 10 milliseconds? | Change to in 0.1 Beacon Interval | Reject |
| **3723** | **Liwen Chu** | **8.4.2.170e** | **133** | **11** | How can you indicate Sector Duration in Beacon Intervals when Period is in units of 10 milliseconds? | Change to in 0.1 Beacon Interval | Reject |
| **3724** | **Liwen Chu** | **8.4.2.170e** | **134** | **6** | If the AP has sector zed antenna and each antenna's sector can't cover whole BSS in a sector zed beacon interval, allowing GrpID 0 STAs to transmit in any beacon interval makes no sense. | Add an indication to indicate whether GrpID 0 STAs can transmit in a sectorized beacon interval. | Reject |
| **3372** | **Alfred Asterjadhi** | **9.48.3** | **295** | **1** | The group sectorization procedure is still not very clear. I think it also need to be clear how to differentiate sectorized Beacon Intervals and Omni Beacon intervals from non-AP STA point of view. | As in comment. | Revised |
| **3625** | **Jerome Henry** | **9.48.3** | **295** | **37** | Same as above "all stations have by default group 0", this can only be true for stations supporting sectorization | Specify that this applies only to STAs supporting sectorization. STAs not supporting secotirzation ignore the sector value (which results in grp 0 equivalent result, but not because of STAs setting their group value). Alternatively, bring line 50 to the beginning of the clause. | Revised  |
| **3626** | **Jerome Henry** | **9.48.3** | **295** | **60** | I see how several groups can be active for a given sector. But as the S1G Sector Operation element is unique in each beacon, and as this element has only one secotr ID field, how does the AP advertizes that several sectors can be active? | Clarify the advertisement mechanism to allow several active sectors (the AP sends beacons at normal intervals, but 2 beacons show different sectors being active for more than one beacon interval? The AP sends beacon bursts, other?) | Reject |
| **3647**  | Kaiying Lv |

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| 8.4.2.170e |

 | 134 | 14 | subclause 8.4.2.170e is to discribe the format of S1G Sector Operation element instead of group sectorization operation which has been discribed in subclause 9.48.3. | Please remove or simplify the text from P134L14 to P134L47 | Reject |
| **3733** | Liwen Chu | 8.4.2.170u | 168 | 38 |

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| Add subfield in Sectorized Group ID Type field to indicate whether the Group ID is identified by Group ID set with each group being identified by Group ID or Group ID bitmap with each group being identified by a bit. This can optimize the element length. |

 | As proposed | Reject |

**CID 3622**

**Discussion:**

The reviewer observe that some STAs may not support sectorization, and would not consider themselves in grp 0, therefore proposes the following changes: “STAs supporting sectorization consider themselves in grp 0 by default”

**Proposed Changes:**

*Instruct the editor to make the following changes in page 134 line 21:*

Replace "by default all stations consider themselves as in grp 0" with “by default all stations that support group sectorization consider themselves as in grp 0”.

**CID 3576**

**Discussion:**

The reviewer proposes to merge the two sectorization modes TXOP based sectorization where the AP transmits through the sectorized beam during a TXOP and respectively the Group Sectorization where the STAs are allowed to transmit and receive during specific time intervals. The STAs in the Group sectorization are informed about their scheduling via Sectorized beacons. The reviewer however fails to notice that these two modes of communications are different both in the impact and implementation, and they could be implemented simultaneously. The former mode uses the beamform to transmit data during the TXOP while the latter mode, Group Sectorization, uses beamformed (sectorized) beacons only to define the geographical sectors of the AP coverage.

**Proposed Changes:**

*Reject.*

**CID 3722, CID 3723**

**Discussion:**

The reviewer asks “how can you indicate Period in Beacon Intervals when Period is in units of 10 milliseconds?” and proposes to use time units relative to the beacon interval. However, the reviewer fails to notice that there are two different types of sectorization modes; in the TXOP based sectorization relative time units based on the beacon are used and in the Group Sectorization the absolute time units are used to define the sector duration. In the Group Sectorization there is not necessary to indicate period in Beacon intervals, moreover using relative time units (beacon based) could be confusing because there are several type of beacons such as Sectorized (beamformed) beacons and Omni beacons that could be transmited at different time intervals.

**Proposed Changes:**

*Reject*

**CID 3724**

**Discussion:**

The reviewer comments: “If the AP has sectorized antenna and each antenna's sector can't cover whole BSS in a sectorized beacon interval, allowing GrpID 0 STAs to transmit in any beacon interval makes no sense.”

In the Group sectorization all AP antennas are receiving UL transmissions all the time. The term sectorization means that only a specific subset of STAs is allowed to transmit at the time. More precisely the STAs are constraint to transmit/receive only specific time intervals corresponding to their geographical sector.

**Proposed Change:**

Reject

**CID 3372**

**Discussion**

The reviewer comments: “The group sectorization procedure is still not very clear. I think it also needs to be clear how to differentiate sectorized Beacon Intervals and Omni Beacon intervals from non-AP STA point of view.”

In the Group Sectorization each beacon carries an indication to specify if the beacon is beamformed (sectorized) or is omni, at the same time each beacon carries information about the beacon period and sector duration, therefore each non-AP STA that receives a beacon could precisely identify if the beacon is sectorized, if it is allowed to transmit and the duration of this allowance (page 133).

**Proposed Change:**

Reevised

*Instruct the editor to add in 9.48.3 Group sectorization operation Page 295 Line 53:*

“In a Group Sectorized BSS:

- The S1G AP shall transmit omni beacon frames every dot11BeaconPeriod as described in 10.1.2.1 (TSF for infrastructure and PBSS networks).

- The S1G AP may transmit sectorized beacon frames every sectorized beacon interval. A non-AP STA that is associated to the AP and is group sectorized capable shall wake up to read the sectorized beacon if it intends to access the medium during the sectorized beacon interval. A non-AP STA that is not group sectorized capable may ignore the sectorized beacon frame and is not subject to the rules described in this subclause.

**CID 3625**

**Discussion**

The reviewer comments: "all stations have by default group 0", this can only be true for stations supporting sectorization”, which is a correct observation; therefore we proposed the text revision as suggested.

**Proposed Change**

Revised

*Instruct the editor to replace* *in Page 295 Line 37* :”Because by default all stations belong to GrpID zero” with ”Because by default all stations that support Group Sectorization mode belong to GrpID zero”

**CID 3626**

**Discussion**

The reviewer comments: “I see how several groups can be active for a given sector. But as the S1G Sector Operation element is unique in each beacon, and as this element has only one sector ID field, how does the AP advertizes that several sectors can be active?”

The AP does not need to specifically advertise that several sectors are simultaneously active, this is naturally achieved by sending multiple (beamformed, sectorized) beacons at the same time, where each beacon indicate the sector time corresponding intervals. In other words during the sector intervals the STA belonging to these sectors are allowed to operate. Those non-AP STA learn that they are allowed to operat via the beacon information element. They are unaware that other non-AP STAs from other beacons are allowed to transmit at the same time intervals, and they do not need to be.

**Proposed Change**

Reject

**CID 3647**

**Discussion**

The reviewer comments:” subclause 8.4.2.170e is to discribe the format of S1G Sector Operation element instead of group sectorization operation which has been discribed in subclause 9.48.3.” The S1G Sector Operation element is an element that conveys the mode of sectorization, and all the information necessary for Group Sectorization to function. Therefore an explanation it is necessary for the field values in this frame.

**Proposed Change**

Reject

**CID 3733**

**Discussion**

The reviewer suggests to “Add subfield in Sectorized Group ID Type field to indicate whether the Group ID is identified by Group ID set with each group being identified by Group ID or Group ID bitmap with each group being identified by a bit. This can optimize the element length.”

The proposed method of signalling becomes efficient when more than 4 groups are active in a single sector in average. Given that the total number of groups is limited to 16, depending of number of sector for instance four or more is expected that the number of active groups in a sector in average does not reach 4. Therefore the the proposed method has little or no benefit at the expense of increasing complexity for implementation.

**Proposed Change**

Reject