IEEE P802.11  
Wireless LANs

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| Proposed resolutions to CID 1003-1015 | | | | |
| Date: 2017-08-10 | | | | |
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Abstract

This submission proposes resolutions to several CIDs submitted on the 11aj D7.0.

The discussion is in reference to Draft IEEE P802.11aj D7.0.

**Revision History**

R0: Initial version.

R1:Improved a number of resolutions.

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| CID | Clause | Page | Line | Type | Comment | Proposed Change |
| 1003 | 10.37a.6 | 128 | 40 | E | Typo in " The SP allocation information obtained by receiving ..." | Change to "The SP allocation information is obtained by receiving ..." |

**Proposed resolution: Accepted**

Change “The SP allocation information obtained by receiving the Extended Schedule element in the DMG Beacon frame of other AP(s) or PCP(s) in the AP or PCP cluster.” to “The SP allocation information is obtained by receiving the Extended Schedule element in the DMG Beacon frame of other AP(s) or PCP(s) in the AP or PCP cluster.”

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| CID | Clause | Page | Line | Type | Comment | Proposed Change |
| 1004 | 10.37a.6 | 128 | 38 | T | As for "for link(s) of other BSSs in the same AP or PCP cluster and according to the interference information from link(s) of other BSS to its BSS and the interference information from link(s) of its BSS to link(s) of other BSS(s) obtained in SPSH measurement phase.", use BSS(s) instead of BSS, make it consistent with the following "BSS(s)". | Change to "for link(s) of other BSS(s) in the same AP or PCP cluster and according to the interference information from link(s) of other BSS(s) to its BSS and the interference information from link(s) of its BSS to link(s) of other BSS(s) obtained in SPSH measurement phase." |

**Proposed resolution**: **Accepted**

Change to "for link(s) of other BSS(s) in the same AP or PCP cluster and according to the interference information from link(s) of other BSS(s) to its BSS and the interference information from link(s) of its BSS to link(s) of other BSS(s) obtained in SPSH measurement phase."

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| CID | Clause | Page | Line | Type | Comment | Proposed Change |
| 1005 | 10.37a.6 | 128 | 39 | T | It is not clear what rules are applied for the link(s) of this AP's BSS and the link(s) of other BSS(s). | Add a rule at the end of this paragraph: The scheduled link(s) of the AP's or PCP's BSS and link(s) of other BSS(s) should not interfere with each other during the same SP. |

**Proposed resolution: Accepted**

***Change the ninth paragraph in 10.37a.6 as follows:***

“In the SP spatial sharing phase, each AP or PCP in the cluster should schedule SPs to achieve spatial sharing according to the received SP allocation information that indicates scheduled SP allocation for link(s) of other BSSs in the same AP or PCP cluster and according to the interference information from link(s) of other BSS to its BSS and the interference information from link(s) of its BSS to link(s) of other BSS(s) obtained in SPSH measurement phase. The SP allocation information obtained by receiving the Extended Schedule element in the DMG Beacon frame of other AP(s) or PCP(s) in the AP or PCP cluster. The scheduled link(s) of the AP's or PCP's BSS and link(s) of other BSS(s) should not interfere with each other during the same SP.”

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| CID | Clause | Page | Line | Type | Comment | Proposed Change |
| 1006 | 24.9.2.2.1 | 182 | 31 | T | It is not correct for "does not feed back the measurement results". For the BRP-TX case, it is also needed to feedback the measurement results. | Change to "feed back the measurement result" |

**Discussion:** For the BRP-TX packets that have e-TRN-T/TRN-T training sequences appended to them, The receiving STA that performs measurements on these sequencesshould feedback the measurement results of both TRN-T and “STF+CE” in the e-TRN-T sequence.

**Proposed resolution: Revised**

***Change the second bullet in the last paragraph in 24.9.2.2.1 as follows:***

BRP-TX packets are packets that have e-TRN-T/TRN-T training sequences appended to them. The transmitting STA may change antenna configuration at the beginning of each sequence. The receiving STA performs measurements on these sequences and sends feedback to the STA that transmits the BRP-TX packet, including the measurement results of alternative link.

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| CID | Clause | Page | Line | Type | Comment | Proposed Change |
| 1007 | 10.37a.2.2 | 122 | 49 | T | Channel Numbers for channel 5,6,7,8 are not correct according to Annex E. | Change Channel 5,6,7,8 to Channel 35,36,37,38, respectively, throughout the 802.11aj SPEC, including Figures and Tables. |

**Proposed resolution: Accepted**

***Change Channel 5,6,7,8 to Channel 35,36,37,38, respectively, throughout the 802.11aj SPEC, including all the Figures and Tables.***

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| CID | Clause | Page | Line | Type | Comment | Proposed Change |
| 1008 | 9.4.2.227 | 50 | 41 | T | It is not clear how "The Available Cluster Time Offset Bitmap field is set to the Available Cluster Time Offset Bitmap field of the ECAPC Policy element." what is the ECAPC Policy element? | Change to "The Available Cluster Time Offset Bitmap field is set to the Available Cluster Time Offset Bitmap field of the reported S-AP's ECAPC Policy element." |

**Proposed resolution: Accepted**

Change to "The Available Cluster Time Offset Bitmap field is set to the Available Cluster Time Offset Bitmap field of the reported S-AP's ECAPC Policy element."

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| CID | Clause | Page | Line | Type | Comment | Proposed Change |
| 1009 | 10.37a.2.2 | 123 | 2 | T | It is not clear how to "find an empty Beacon SP". | Add a rule to specify how to "find an empty Beacon SP" based on the received cluster information of the S-AP. |

**Discussion:** A rule that specifies how to find an empty Beacon SP based on the received cluster information of the S-AP is required here.

**Proposed resolution: Revised**

***Change bullet a) in P123L2 as follows:***

1. The AP or PCP shall monitor the channel for DMG Beacon frames during each Beacon SP over an interval of length at least aMinChannelTime to find an empty Beacon SP and measure the status of each Beacon SP and the signal quality (RCPI and RSNI) of the received DMG Beacon frames based on the received cluster information of the S-AP. The AP or PCP can determine the timing start point of each Beacon SP over a BI of the S-AP based on the Next BTI Offset field, the Reported BI Duration field and the Reported Clustering Control field. Thus, the AP or PCP can measure each Beacon SP over a BI of the S-AP based on the timing start point of each Beacon SP over a BI and obtain the status of each Beacon SP and signal quality over a BI.

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| 1010 | 10.37a | 117 | 46 | G | This subclause defines the CDMG clustering, text may needs to be improved. The relationship with the DMG clustering should be specified. | Clarify the relationship with the DMG AP/PCP clustering mechnism and improve the description of this subclause. |

**Discussion:** The relationship with the DMG AP/PCP clustering mechanism is clearly described in 10.37a.1 (General). So, only some text may need to be improved.

**Proposed resolution: Revised**

**10.37a.2.1 Decentralized CDMG AP or PCP cluster formation**

***Change bullet b) in P120L35 as follows:***

b) Determine whether the ratio of BI 2 divided by CDMG SBBI of the S-AP or S-PCP is an integer. If the ratio of BI 2 divided by CDMG SBBI of the S-AP or S-PCP is an integer, the AP or PCP 1 shall adjust CDMG SBBI 1 to equal to CDMG SBBI of the S-AP or S-PCP; otherwise, the AP or PCP 1 shall change its beacon interval length BI 2 to BI 3 on 2.16 GHz channel during its next NP 1 and set its CDMG SBBI 1 to the CDMG SBBI of S-AP or S-PCP during the BTI, to make the ratio of BI 3 divided by CDMG SBBI of the S-AP or S-PCP is an integer. For both cases, the AP or PCP 1 shall notify the AP or PCP 2 of the new BI 2 or BI 3 during the first QP at the end of BI 2 or BI 3, where the QP comprises the NP and a guard interval (GI) used for channel switching, and the AP or PCP 2 should also adjust its SBBI 2, to make the ratio of BI 2 or BI 3 divided by CDMG SBBI 2 is an integer.

***Change bullet b in P120L50 as follows:***

An example of adjusting BI and CDMG SBBI for step a) and b) is illustrated in Figure 10-58c (Example of joining the CDMG AP or PCP cluster for a CDMG AP or PCP involved in a synchronization pair with another AP or PCP). For step a) and step b), changing BI on the 2.16 GHz channel or changing SBBI on the 1.08 GHz channel is completed by AP or PCP 1 by negotiation with AP or PCP 2 in a notification period (NP) that comprises NP1 and NP2. AP or PCP 1 transmits the DMG Beacon frame to AP or PCP 2 in NP1 and AP or PCP 2 transmits the DMG Beacon frame to AP or PCP 1 in NP2.

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| 1011 | 10.36.11 | 116 | 8 | T | It is not clear how many channels on which AP can allocate SPs. | Define a rule to clarify the allocation mechnism when alternative channel is used. |

**Proposed resolution: Revised**

***Change the last paragraph in 10.36.11 as follows***

A CDMG AP or PCP may allocate a pair of STAs to perform SLS on an alternative channel. A CDMG STA may reuse the transmit sector indicated by the Sector Select field obtained from the operating channel which is the primary channel on an alternative channel with the same channel width, and vice-versa. If an SPR frame with the Beamforming Training field equal to 1 is received from a CDMG initiator STA, the CDMG AP or PCP may configure a channel for the initiator and the responder designated by the initiator to perform BF training according to the AllocationType field in the SPR frame. The SPR frame contains channel allocation request in the AllocationType field and BF Control field for the initiator and responder that form a BF pair. If the NoPrimaryChannel subfield in the BF Control field is equal to 1 and the Beamforming Training field is equal to 1 in the SPR frame, the CDMG AP or PCP can allocate SPs on an alternative channel using the EDMG Extended Schedule element included in a DMG Beacon frame or an Announce framefor the initiator and the responder. If the CDMG AP or PCP receives SPR frames from multiple pairs of initiators and responders, the CDMG AP or PCP may allocate time overlapping SPs on designated channels with different channel numbers for different pairs of STAs to perform an SLS.

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| 1012 | 10.37a.6 | 128 | 40 | E | Grammer mistake in this " The SP allocation information obtained by receiving the Extended Schedule element" | Change to " The SP allocation information is obtained according to the received Extended Schedule element" |

**Proposed resolution: Accepted**

Change “The SP allocation information obtained by receiving the Extended Schedule element in the DMG Beacon frame of other AP(s) or PCP(s) in the AP or PCP cluster.” to “The SP allocation information is obtained according to the receiving the Extended Schedule element in the DMG Beacon frame of other AP(s) or PCP(s) in the AP or PCP cluster.”

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| 1013 | 24.9.2.2.2 | 182 | 46 | T | It is not clear what is "adjacent links " | Add more description to define the "adjacent links". |

**Proposed resolution: Revised**

***Change the second paragraph in 24.9.2.2.2 as follows:***

If the Enhanced Beam Tracking Request field in the PHY header is equal to 1, each BRP packet is composed of an STF, a CE field, and a data field followed by a training field containing an AGC training field, a receiver training field (TRN-R/T), an STF field and a CE field. The collection of the AGC training field, TRN field, STF field and CE field at the end of BRP packet is termed an e-TRN field. The AGC training fields and TRN fields are used to train the current link and the adjacent links of the current link during beam tracking process. The alternative link is a beam link with different propagation characteristic that cannot be measured accurately by the AGC field and the training field (TRN-R/T) that are used for measuring the adjacent beam links. The STF field and CE field at the end of BRP packet are used for measuring and training the alternative link of CDMG STAs during enhanced beam tracking (see 10.38.9 (CDMG enhanced beam tracking)). The BRP packet structure for CDMG STAs that perform enhanced beam tracking is shown in Figure 24-9 (BRP packet structure (CDMG STAs)).

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| 1014 | 10.38.9 | 129 | 31 | G | Text may need to be improved. For example, the Annex Y should be referred in this subclause. | Annex Y should be referred in this subclause |

**Proposed resolution: Revised**

***Insert a paragraph at the end of 10.38.9:***

An example of beam tracking and switching for enhanced beam tracking is shown in Annex Y.3.

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| 1015 | 10.36.6.6.2a | 109 | 32 | T | It is not clear what happened if the first RTS/DMG CTS is failed. | Define a rule for the case of the first RTS/DMG CTS is failed |

**Proposed resolution: Revised**

***Insert a paragraph after Figure 10-56a***

If an RTS/DMG CTS frame exchange on the 1.08GHz channel failed, the CDMG STA shall not transmit the subsequent RTS frame on the 2.16 GHz channel after SIFS from the end of the expected CTS frame on the 1.08 GHz channel as shown in Figure 10-56a (An example of creating a CDMG protected period on two channels for CDMG STAs).

***Change the last paragraph in 10.36.6.6.2a as follows:***

A CDMG AP or PCP can merge the time interval of listening mode when creating a CDMG protected period and the channel measurement time during SPSH (see 11.32 (Spatial sharing and interference mitigation for DMG STAs)) by using the Protected Period subfield and the Directional Channel Quality Request element. If the AP or PCP determines two SPs allocated for two pairs of CDMG STAs within the BSS should both be created with protected period, the AP or PCP may transmit a Directional Channel Quality Request element to the two pairs of STAs based on allocation positions of the SPs for the two pairs of STAs. The directional channel measurement time interval indicated by the Directional Channel Quality Request element of one pair of STAs should cover the listening mode that begins at the start of the SP of this pair of STAs. Thus, the two pairs of STAs can direct their received antennae to its peer STAs involved in the same SP, to perform channel monitoring required by the protected period establishing and perform the directional channel quality measurement required by the SPSH mechanism simultaneously. The AP or PCP may use the received Directional Channel Quality Report elements after the listening mode for subsequent SPSH with time overlapping SPs for the two pair of STAs after the beginning of the next BI.

**References:**

1. Draft P802.11aj\_D7.0