IEEE P802.11
Wireless LANs

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| Comment resolution for clause 10.28 |
| Date: 2017-02-13 |
| Author(s): |
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Abstract

The document contains comment resolutions to 13 CIDs assigned to Jarkko Kneckt and commenting on clause 10.28.

The submission solves 13 CIDs

The solved CIDs are: 5164 6974, 6975,6978, 6979, 6980, 6981, 7532, 7533, 8293, 8486, 9865, and 9866.

CID9472 is reassigned to David Yangxun.

R0 – Initial Draft

R1 ­– Few editorial corrections to CID 7533 and 9866 resolutions as suggested by Tomo Adachi.

R2 –The same sentence as corrected in R1 is corrected again.

R3 – Changes and suggestions as discussed in 802.11ax teleconference on February 2nd 2017 are included.

R4 – Editorial changes and clarifications to AC Constrain field value 0 as proposed by Alfred Asterjadhi are implemented.

R5 – Added resolution to CID5164.

**References:**

**[1] Draft P802.11ax\_D1.0**

**[2] 11-17-0010-06-00ax-comments on tgax-d1-0**

CID 6974

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| CID | Page | Clause | Comment | Proposed Change |
| 6974 | 136.31 | 10.28.3 | Why is this requirement in a note. I do not see a requirement anywhere in the specification for the HE RD initiator, except in this section. Hence this should either be a normative statement or should not be in the amendment. | Remove the Note. Add a normative statement if required. |

Discussion: The comment has valid point. The note should be normative text.

Proposed Resolution: Revised.

The Note is specifying the a possibile operation of the HE STA. The note is changed to normative text.

Please make the changes to 802.11ax D1.0 as shown in the submission 11-17-0191r4.

CID 6975

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| CID | Page | Clause | Comment | Proposed Change |
| 6975 | 136.40 | 10.28.3 |  |  | Why is this behavior specific to an HE STA and why can an HE non-AP STA use RD in any TXOP? | Clarify this behavior |

Discussion: The comment is suggesting that non-AP STA could not use RD in any STA. The pointed text is discussing on the use of the AC Constraint field that is limiting the ACs that may be transmitted in the RD responder.

Any STA may allow RD use in any of TXOP in which it is TXOP Holder. There is no difference between HE and non-HE STAs.

The HE AP maintains knowledge of the UL data that is buffered in the associated STAs and DL data it has buffered. Also, the HE AP knows the TWT schedules and knows when it is expected to serve other STAs. The HE AP may use information to know how long it should transmit to the STA and when it should start to serve the next STAs.

The HE AP and HE STA can enlarge the sizes of the transmitted PPDUs which improves 802.11ax transmission efficiency and reduces transmission overheads.

Proposed Resolution: Revised. The HE AP has knowledge of the UL and DL data that waits to be transmitted and the times when the TWT schedules occur. The HE AP may use this information to decide what is the most urgent data that it should transmit to the STA and should the AP serve other STAs. When AP is allowed to respond with a frame from any AC, the non-AP STA channel listening time may be shortened and BSS throughput may be improved. Please make the changes to 802.11ax D1.0 as shown in the submission 11-17-0191r4.

CID6978

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| CID | Page | Clause | Comment | Proposed Change |
| 136.50 | 10.28.3 | The addition of Multi-STA BlockACK to the list of frames for behavior of a non-HE RD initiator, breaks the specification because a non-HE RE initiator does not know what a Multi-STA BlockACK is as this an HE concept | Delete "Multi-STA BlockAck" |

Discussion: The comment is pointing out that non-HE RD Initiator is not capable to transmit Multi-STA Block ACK.

Proposed Resolution: Revised. Multi-STA Block Ack allows RD responder to acknowledge MPDUs from multiple ACs, so the frame type is good to be available. The condition to require that responder is non-HE STA is removed.

Please make the changes to 802.11ax D1.0 as shown in the submission 11-17-0191r4.

CID 6979

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| CID | Page | Clause | Comment | Proposed Change |
| 6979 | 136.50 | 10.28.3 | Insert a requirement that an HE RD initiator shall be able to transmit a +HTC or DMG frame with the RDG/More PPDU subfield set to 1 that requires a response of a Multi-STA BlockAck frame. | Insert a requirement for A HE RD initiator, as suggested in the comment. |

Discussion: The comment requests to add a condition when Multi-STA BlockAck may be used. The rules when Compressed Block Ack or a multi-STA Block Ack may be used are defined in clauses related to the block acks. It may be that even if a block ack is supported, there has not been any ADDBA signaling.

To keep the clause 10.28.3 short, focused and to avoid repetition.

Proposed resolution: Rejected. The rules when block ack may be used are described in other clauses. To keep the clause 10.28.3 short, focused and to avoid repetition. More clarifications may complicate the specification.

CID 6980

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| CID | Page | Clause | Comment | Proposed Change |
| 6980 | 137.10 | 10.28.4 | The use of the word "while" is not appropriate. While is usually used to connote that something only occurs during a specific time, i.e. while something else is happening. It is not used to indicate alternative behavior. | delete the word "while" |
| Discussion: Agree with the comment. Proposed Resolution: Revised. Agree in principle. The commented text has been changed to bulleted list format. Please make the changes to 802.11ax D1.0 as shown in the submission 11-17-0191r4. |
| 6981 | 137.19 | 10.28.4 |  |  | The use of the word "while" is not appropriate. While is usually used to connote that something only occurs during a specific time, i.e. while something else is happening. It is not used to indicate alternative behavior. | delete the word "while" |

Discussion: Agree with the commenter.

Proposed Resolution: Proposed Resolution: Revised. Agree in principle. The commented text has been changed to bulleted list format. Please make the changes to 802.11ax D1.0 as shown in the submission 11-17-0191r4

CID7532

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| CID | Page | Clause | Comment | Proposed Change |
| 7532 | 136.50 | 10.28.3 | How would a non-HE STA expect a response of MBA? | removes "Multi-STA BlockAck" |

Discussion: The CID is similar to 6978. The comment is pointing out that non-HE RD Initiator is not capable to transmit Multi-STA Block ACK.

Proposed Resolution: Revised. Multi-STA Block Ack allows RD responder to acknowledge MPDUs from multiple ACs, so the frame type is good to be available. The condition to require that responder is non-HE STA is removed.

Please make the changes to 802.11ax D1.0 as shown in the submission 11-17-0191r4.

CID7533

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| CID | Page | Clause | Comment | Proposed Change |
| 7533 | 137.10 | 10.28.4 |  |  | If the RD initiator sends a multi-TID AMPDU with RDG=1, how does the RD responder determine the primary AC?In 10.9, it says "The HT Control field of all MPDUs containing the HT Control field aggregated in the same A-MPDU shall be set to the same value.", so it is difficult to determine which AC granted the RDG | Clarify "the same AC" means the lowest AC in case of a multi-TID AMPDU from RD initiator |

Discussion: The comment proposes more clarity how the ACs are selected by RD responder to respond to a multi-TID MPDU. The Lowest AC is good to mention here, so that AC handling is well defined.

Similarly when the AC Constraint is set to 0, the use of ACs in the response is not well described.

Proposed Resolution: Revised. Agree in principle with the commenter. The text is changed and the lowest AC is used in descriptions from which AC the frame may be transmitted.

Please make the changes to 802.11ax D1.0 as shown in the submission 11-17-0191r4.

CID8293

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| CID | Page | Clause | Comment | Proposed Change |
| 8293 | 137.10 | 10.28.4 |  |  | A HE RD responder may transmit A-MPDU with MPDUs from multiple TIDs that are from the same AC or higher AC. What is the consequence for the backoff values of the transmitted Acs ? What about QoS ? | I propose to reset current backoff values of transmitting ACs. |

Discussion: The comment is asking to reset the current backoff value when a STA is RD responder and transmit a frame from an AC.

Proposed Resolution: Rejected.

The reverse direction protocol is defined in 802.11n. The RD initiator obtains the TXOP and RD initiator’s backoff is updated. When a STA obtains a TXOP with EDCA and transmit a multi-TID A-MPDU containing MPDUs from the primary AC and the higher ACs, the backoff is only updated for the primary AC.

The RD responder has never updated its backoff. Similarly, if the RD responder is allowed to transmit without AC constraint the RD responder has not updated its backoff to any AC from which it has transmitted.

802.11ax is following the same guidelines and thus, there is no backoff reset for the RD responder and RD initiator resets its backoff only on the primary AC.

No changes to draft, so the comment is rejected.

CID 8486

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| CID | Page | Clause | Comment | Proposed Change |
| 8486 | 136.44 | 10.28.3 | Non-HE STAs don't send Multi-STA BlockAck frames so the edits here don't make sense. | Remove the Multi-STA Block Ack insertion. |

Discussion: The CID is similar to 6978. The comment is pointing out that non-HE RD Initiator is not capable to transmit Multi-STA Block ACK.

Proposed Resolution: Revised. Multi-STA Block Ack allows RD responder to acknowledge MPDUs from multiple ACs, so the frame type is good to be available. The requirement that responder is non-HE STA is removed.

Please make the changes to 802.11ax D1.0 as shown in the submission 11-17-0191r4.

CID 9865

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| CID | Page | Clause | Comment | Proposed Change |
| 9865 | 136.50 | 10.28.3 | Non-HE STA does not solicit Multi-STA BlockAck as it is newly defined in 11ax. Therefore, if this rule is applied only to non-HE STA, we don't need to mention Multi-STA BlockAck. Also, if we define a rule for non-HE RD initiator, we also need to define a rule for HE RD initiator. | As in the comment. |

Discussion: The comment is similar to to 6978. The comment is pointing out that non-HE RD Initiator is not capable to transmit Multi-STA Block ACK.

Proposed Resolution: Revised. Multi-STA Block Ack allows RD responder to acknowledge MPDUs from multiple ACs, so the frame type is good to be available. The requirement that the responder is a non-HE STA is removed.

Please make the changes to 802.11ax D1.0 as shown in the submission 11-17-0191r4.

CID9866

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| CID | Page | Clause | Comment | Proposed Change |
| 9866 | 137.11 | 10.28.4 | Description is needed in case the last frame received from the RD initiator is Multi-TID A-MPDU. | As in the comment. |

Discussion: The comment points out a missing description from the spec. The comment is similar to CID7533.

Proposed resolution: Revised. Agree in principle with the comment. The same AC is replaced by the lowest AC. Please make the changes to 802.11ax D1.0 as shown in the submission 11-17-0191r4.

CID5164

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| 5164 | 136.19 | 10.28 | Regarding, "10.28 Reverse direction protocol", this was added in 11n to address TCP ACK delivery, but was hardly (or not at all) implemented in any devices. Rather than continue to modify RDP, introduce TCP ACK Proxy. And while we're crossing layer boundaries, mechanisms to limit traffic at layer 2 due to higher layer discovery would also improve network efficiency. | define such protocols |

Discussion: The comment is proposing a TCP ACK proxy operation instead of reverse direction protocol.

The comment also suggests that there should be a mechanism to limit traffic at layer 2 due to higher layer discovery. This second proposed operation in the comment is not clear. There is no proposed change in the comment or details how the higher layer discovery should be detected and considered.

The proposed TCP ACK proxy functionality is not described in details. The assumption is that TCP ACK proxy includes TCP ACK together with transmitted MAC acknowledgements frames. This data flow is possible to perform with RDP and it is possible to implement the data flow required for TCP acknolwedgements transmission with RDP.

Proposed Resolution: Rejected.

The comment fails to identify a specific issue to be addressed.

It fails to identify changes in sufficient detail so that the specific wording of the changes that will satisfy the commenter can be determined.

**10.28 Reverse direction protocol**

**10.28.3 Rules for RD initiator**

***Change the 3rd and subsequent 2 paragraphs as follows:***

Instructions to ax Editor: *Make the changes shown.*

Transmission of a +HTC or DMG frame by an RD initiator with the RDG/More PPDU subfield equal to 1 (either transmitted as a non-A-MPDU frame, as a VHT single MPDU, or within an A-MPDU) indicates that the duration indicated by the Duration/ID field is available for the RD response burst and RD initiator final PPDU (if present).

~~NOTE—~~An HE RD initiator may include~~s~~ (#6974) an RDP ~~A-~~Control subfield in QoS Data or Management frames it transmits. (#6974)

An RD initiator that sets the RDG/More PPDU subfield to 1 in a +HTC or DMG frame transmitted during a TXOP shall set the AC Constraint subfield to 1 in that frame if the TXOP was gained through the EDCA channel access mechanism and shall otherwise set it to 0. An RD initiator that sets the RDG/More PPDU subfield to 1 in a DMG frame transmitted during an SP can set the AC Constraint subfield to 1 to limit the Data frames transmitted by the RD responder. An HE ~~non-AP~~ STA RD initiator that sets the RDG/More PPDU subfield to 1 in a frame transmitted during a TXOP ~~shall set the AC Constraint to 1, while an HE AP RD initiator~~ may set the AC Constraint subfield to 1. (#6975)

An ~~A non-HE~~ (#6978, #7532, #8486, #9865) RD initiator shall not transmit a +HTC or DMG frame with the RDG/More PPDU subfield set to 1 that requires a response MPDU that is not one of the following frames:

—Ack

— Compressed BlockAck

— Multi-STA BlockAck

**10.28.4 Rules for RD responder**

***Change the 5th and subsequent 2 paragraphs as follows:***

Instructions to ax Editor: *Make the changes shown.*

An RD responder shall not transmit an MPDU (either individually or aggregated within an A-MPDU) that is not one of the following frames:

— Ack

* —  Compressed BlockAck
* —  Compressed BlockAckReq
* —  Extended Compressed BlockAck
* —  Extended Compressed BlockAckReq
* —  Multi-STA BlockAck
* —  QoS data
* —  Management

If the AC Constraint subfield is equal to 1 in the last frame received from the RD initiator;

* The non-HE RD responder shall transmit same Data frames of only the AC as the last frame received from the RD initiator~~, while the~~.
* The (#6980) HE RD responder may transmit an A-MPDU or multi-TID A-MPDU with MPDUs from one or more ACs that have a priority that is equal to or higher than the lowest priority AC of the MPDU(s) carried in the last PPDU received from the RD initiator (see 10.13(A-MPDU operation) and when the RD initiator is an HE STA subject to the additional rules defined in 27.10.4(A-MPDU with multiple TID). (#6981, #7533, #9866)

For a BlockAckReq or BlockAck frame, the AC is determined by examining the TID field. For a Management frame, the AC is AC\_VO. The RD initiator shall not transmit a MPDU with the RDG/More PPDU subfield set to 1 from which the AC cannot be determined.

~~– the HE RD responder may transmit Data frames of any TIDs, as described in 27.10.4 (A-MPDU with multiple TIDs).~~ (#6981)