IEEE P802.11
Wireless LANs

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| REVmd LB232 EDITOR2 ad-hoc related comment resolutions  |
| Date: 2018-08-10 |
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##### This submission presents proposed resolution to the following 4 CIDs: 1038, 1070, 1072, and 1084. The proposed changes are based on REVmd/D1.2.

##### Revision history:

##### R0 – initial version

R1: Includes changes discussed and agreed at 2018-08-10 TGmd teleconference

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| CID | Clause | Page | Line | Comment | Proposed Change |
| 1038 | I.4 | 4060 | 44 | The DMGEncodingExamples.zip file embedded in the IEEE 802.11Working Group document 11-12/0751r0 still includes OFDM vectors. | Open the zip, remove the OFDM related files and references and build a new zip. This zip to be placed in a new file, and place the link to the new file into REVmd. |

***Discussion:***

The following is a summary of what the Task Group has discussed on April 6 (c.f., 18/0612r0):

This CID is resolved by Lei Huang (Panasonic)’s technical submissions 18/0334r2 and 12/0751r1:

<https://mentor.ieee.org/802.11/dcn/18/11-18-0334-02-000m-annex-i-dmg-ofdm-removal.docx>

<https://mentor.ieee.org/802.11/dcn/12/11-12-0751-01-00ad-dmg-encoding-examples.docx>

***Proposed resolution:***

**Revised**

The OFDM vectors are removed and the DMGEncodingExamples.zip file embedded in the IEEE 802.11 Working Group document is now updated as 11-12/0751r1 at <https://mentor.ieee.org/802.11/dcn/12/11-12-0751-01-00ad-dmg-encoding-examples.docx>.

Note to editor: CID 1037 is similar, and the resolution to 1037 was approved in July 2018, Motion 49.

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| CID | Clause | Page | Line | Comment | Proposed Change |
| 1070 | 10.4 | 1617 | 21 | The 11ai title change here is misleading. MPDUs are not fragmented; MSDUs, MMPDUs and, in 11ax, A-MSDUs are fragmented. The 11ai motivation for the title change seems to be to differentate MSDU/MMPDU fragmentation from element fragmentation. Similar problem with the title of 10.5. | Revert to the original title or, alternatively, "MSDU and MMPDU fragmentation". (11ax can change to "MSDU, A-MSDU and MMPDU fragmentation) |

***Discussion:***

The original titles of clauses 10.4 and 10.5 are Fragmentation and Defragmentation, respectively.

In IEEE 802.11ai-2016 amendment, the titles are renamed as MPDU fragmentation and MPDU defragmentation, respectively. Further, element fragmentation and element defragmentation are introduced (c.f., clauses 10.29.11 and 10.29.12, respectively) with the following motivation:

*“The general format of elements limits the size of the information to 255 octets in an element without Element ID Extension field or 254 octets in an element with Element ID Extension field. Information that is too large to fit in a single element is fragmented into a series of elements consisting of the element that the information does not fit, immediately followed by one or more Fragment elements …”*

However, the contents are not related to MPDU.

***Proposed resolution:***

**Revised**

Change the title of clause 10.4 to “MSDU and MMPDU fragmentation”.

Change the title of clause 10.5 to “MSDU and MMPDU defragmentation”.

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| CID | Clause | Page | Line | Comment | Proposed Change |
| 1072 | 10.45 | 1897 | 11 | Sync frame operation or synchronization frame operation but not synchronization (sync) frame operation. There is no need to have more than one term and sync frame operation is just as good as synchronization frame operation. Also, the term is not consistently used. At P1897L16 it is "sync frame transmission procedure". At P1897L32 and other places a new, possibly related, term ("sync frame transmission") is used. | Change to "sync frame transmission" throughout. |

***Proposed resolution:***

**Revised**

***TGm Editors: Please modify clause 10.50 of REVmd/D1.2 as follows:***

10.50 Sync frame operation(#1071)(11ah)

10.50.1 Sync frame transmission procedure for uplink traffic

This subclause describes a sync frame transmission procedure for uplink traffic, which minimizes the time for medium synchronization for a STA that is changing from Doze to Awake in order to transmit.

If dot11S1GUplinkSyncOptionImplemented is true, an AP shall set the Uplink Sync Capable field in the S1G Capabilities element to 1. If dot11S1GUplinkSyncOptionImplemented is false, the AP shall set the Uplink Sync Capable field in the S1G Capabilities element to 0.

An AP is an UL-Sync (Uplink Sync) capable AP if it sets the Uplink Sync Capable field to 1.

A STA may request to an UL-Sync capable AP to transmit a sync frame at the slot boundary of the STA in a RAW or at the target wake time of the STA.

A STA may request for a sync frame transmission to the UL-Sync capable AP either during association by sending a (Re)Association Request frame in which the Uplink Sync Capable field in the S1G Capabilities element is equal to 1 or at any time by sending a Sync Control frame (an Action frame of category S1G) in which the Uplink Sync Request field in the Sync Control field is equal to 1.

A STA may request to stop the sync frame transmission to the UL-Sync capable AP at any time by sending a Sync Control frame in which the Uplink Sync Request field in the Sync Control field is equal to 0.

When a STA is requesting for the sync frame transmission, a STA may also request to an AP to protect a RAW slot in a RAW defined in the Slot Duration field (9.4.2.191 (RPS element(11ah))) or a time duration at a TWT defined in the Nominal Minimum TWT Wake Duration field (9.4.2.199 (TWT element(11ah))), or by setting the Time Slot Protection Request field in the Sync Control field to 1. A STA may also request to an AP protection for a TXOP duration after the expiration of a wakeup timer as described in 10.49.2 (Rescheduling of awake/doze cycle). The time slot protection is not requested, if the Time Slot Protection Request field is equal to 0. When an AP receives a Sync Control frame from a STA with the Time Slot Protection Request field equal to 1, the AP shall protect a time slot that is assigned for the STA in a RAW, or a time duration that is assigned for the STA at a TWT, or a TXOP duration after the expiration of a wakeup timer of the STA with NAV-setting frame exchanges. Note that NAV-setting frame exchanges refer to any frame that can set NAV to other third-party stations, and AP has the flexibility to choose any NAV-setting frame exchanges for protection.

For a STA that requested for a sync frame transmission, the UL-Sync capable AP shall schedule a sync frame at the slot boundary of the STA in the RAW if the Time Slot Protection Request field is equal to 1 or the Cross Slot Boundary field is equal to 1, or at the TWT of the STA, or at the expiration of the wakeup timer, as the next frame for transmission according to the medium access rules specified in Clause 10 (MAC sublayer functional description(#107)).

If the medium is busy at the slot boundary of the STA in the RAW or at the TWT of the STA, or at the expiration of the wakeup timer, or if the UL-Sync capable AP determines that the remaining time in the RAW slot or the TWT SP, or the TXOP duration to be too short to transmit a sync frame, the UL-Sync capable AP shall cancel the scheduled sync frame transmission. When the STA is changing from Doze to Awake in order to transmit, the STA shall follow the rules defined in 11.2.3.2 (Non-AP STA power management modes(11ah)).

The UL-Sync capable AP should use the NDP CTS frame as a sync frame.

When a STA receives an NDP CTS frame with the RA/Partial BSSID field equal to the S1G partial AID of the STA from the UL-Sync capable AP with which the STA is associated, the STA shall transmit a Data frame to the AP a SIFS after the reception of the NDP CTS frame if the STA has a Data frame to transmit to the AP and has requested the AP for a sync frame transmission. When a STA receives an NDP CTS frame with the RA/Partial BSSID field not equal to the S1G partial AID of the STA, the STA shall follow the NAV setting rules defined in 10.3.2.4 (Setting and resetting the NAV). After transmitting the NDP CTS frame, the AP shall wait for an AckTimeout interval (as defined in 10.3.2.11 (Acknowledgment procedure)), starting at the PHY-TXEND.confirm primitive. If a PHY-RXSTART.indication primitive does not occur during the AckTimeout interval, the AP may transmit a CF End frame or an NDP CF-End frame to reset the NAV provided that the remaining duration is long enough to transmit this frame.

For a STA requesting for the sync frame transmission with the Time Slot Protection Request field set to 0, the AP should not send a sync frame at each slot boundary within a RAW period if the Cross-Slot Boundary field is equal to 0.

Figure 10-101 (Example of uplink sync frame transmission procedure in RAW(11ah)) illustrates an example of the uplink sync frame transmission procedure in a RAW. STA1 is allocated Slot1 in the RAW and STA2 is allocated Slot3 in the RAW. Both STA1 and STA2 have requested the UL-Sync capable AP to transmit a sync frame at the slot boundary. At the slot boundary of Slot1, the medium is idle and thus the AP transmits a sync frame at the slot boundary. However, at the slot boundary of Slot3, the medium is busy and thus the AP cancels the scheduled sync frame transmission for STA2.

***TGm Editors: Please replace “synchronization (Sync)” with “sync” in 2186.26 of REVmd/D1.2.***

At 3674.24 in the second column change “Synchronization (sync) frame operation” to “Sync frame operation”

At 1782.63 change “Sync” to “sync”. Also at P2186 (Lines 26, 31 (2x), 36, 40, 41, 43, 51, 52, 53, 55, 61, 62, 63(2x). Also at 2187L14.

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| CID | Clause | Page | Line | Comment | Proposed Change |
| 1084 | 10.3.2.1 | 1574 | 37 | Let's leave this kind of language to the attorneys. | "A virual CS mechansim referred to as the NAV shall be provided by all MACs. An additional virtual CS mechanism referred to as response indication deferral (RID) shall be provided by S1G MACs" (the current wording does not require RID in S1G MACs; is it a requirement?) Update the subsequent paragraphs as appropriate. |

***Discussion:***



***Proposed resolution:***

***Revised***

***Note to the commenter: RID is required for S1G MACs.***

***TGm Editors: Please modify clause 10.3.2.1 of REVmd/D1.2 as follows:***

A virtual CS mechanism, referred to as the NAV, shall be provided by all MACs. An additional virtual CS mechanism, referred to as response indication deferral (RID), shall be provided by S1G MACs.

(11ah) The NAV maintains a prediction of future traffic on the medium based on duration information that is announced in RTS/CTS frames by non-DMG STAs and RTS/DMG CTS frames by DMG STAs prior to the actual exchange of data. The duration information is also available in the MAC headers of all frames (M53)other than (11ah)PV1 MAC frames and PS-Poll frames, and during the BTI, the A-BFT, the ATI, the CBAP, and the SP. (11ah)The duration information in a frame transmitted by an S1G STA is also available in PS-Poll+BDT frames, in NDP CTS frames, in NDP Ack frames whose Idle Indication field value is 0, and in NDP\_2M PS-Poll-Ack frames whose Idle Indication field is 0.

(11ah)The mechanism for setting the NAV using RTS/CTS or RTS/DMG CTS in the DCF is described in 10.3.2.4 (Setting and resetting the NAV), (#65)and use of the NAV in HCF is described in 10.24.2.2 (EDCA backoff procedure) and 10.24.3.4 (NAV operation of a TXOP under HCCA). Additional details regarding NAV use appear in 10.3.2.6 (RTS/CTS with fragmentation), 10.3.2.15 (NAV distribution), 10.40.10 (Updating multiple NAVs), and 10.28 (Protection mechanisms).

(11ah) The mechanism for setting the RID is described in 10.3.2.5 (Setting and resetting the RID(11ah)).