IEEE P802.11
Wireless LANs

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| CC36 comment resolution: Triggered TXOP Sharing |
| Date: 2020-08-20 |
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Abstract

This submission proposes resolutions for multiple comments related to TGbe D1.0 with the following CIDs:

 4823, 5141, ~~5240,~~ 5903, ~~5963,~~ 5964,6073, ~~6074,~~ ~~6353,~~  6555, ~~6649,~~ 6980, ~~8325~~

Revisions:

* Rev 0: Initial version of the document.

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGbe Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbe Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGbe Editor: Editing instructions preceded by “TGbe Editor” are instructions to the TGbe editor to modify existing material in the TGbe draft. As a result of adopting the changes, the TGbe editor will execute the instructions rather than copy them to the TGbe Draft.***

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| **CID** | **PP** | **LL** | **Comment** | **Proposed Change** | Resolution |
| 5240 | 243 | 56 | We need a mechanism for how much/which resources (e.g., BW, Required time) a non-AP STA wants to use for peer-to-peer transmission, which would be helpful when an EHT AP allocates time to the non-AP STA and transmits MU-RTS TXS frame | As in the comment | Rejected. The SCS negotiation can help AP’s resource allocation for triggered TXOP sharing.  |
| 5963 | 243 | 53 | The AP needs to know the resource rquirement in order to allocate the time to STA for TXOP sharing. | Add the related text. | Rejected. The SCS negotiation can help AP’s resource allocation for triggered TXOP sharing.  |
| 6074 | 243 | 53 | the mechanism to provide the reqource request to AP by a STA for TXOP sharing should be defined. The AP can figure out whther the request is fir TB PPDU or for TXOP sharing. The simple solution could be using QoS Control field to carry the requested medium time for 20MHz BW. | Address the issue raised by the comment. | Rejected. The SCS negotiation can help AP’s resource allocation for triggered TXOP sharing.  |
| 6353 | 243 | 55 | It would be benificial if a STA can request from the AP to schedule some time in its TXOP to transmit data. The AP needs to know some information regarding allocated time requested and when needed. Especially in the case of P2P, time request should be sent to the AP | Add a procedure to allow the non-AP STA to request the AP STA to schedule SU triggered based period and indicate requested time and time to schedule that period | Rejected. The SCS negotiation can help AP’s resource allocation for triggered TXOP sharing.  |
| 6649 | 243 | 53 | 802.11be D1.0 has defined the Trigger TXOP TXS procedure which allows a AP to grant a STA with its obtained TXOP, but the solution on how the STA notify the duration , buffer length, etc. to the AP in advance is missing. | BSR control frame is the best place to indicate the requested TXOP duration or the length of buffered traffic in granted TXOP case, but there is no reserved bit in BSR, we can consider to signaling these information in a new A-control frame. | Rejected. The SCS negotiation can help AP’s resource allocation for triggered TXOP sharing.  |
| 8325 | 245 | 34 | AP doesn't know any P2P transission information, how to allocate the time?Please add some mechanism to improve the scheduling efficency. | as in comment. | Rejected. The SCS negotiation can help AP’s resource allocation for triggered TXOP sharing.  |
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| 5141 | 245 | 62 | A STA that received the Triggered TXOP sharing cannot transmit a PPDU after the CTS frame, because the STA has a nonzero NAV based on the MU-RTS TXS Trigger frame or the previous frame. | Define a rule to ignore NAV for a non-AP STA to utilize the allocated TXOP. | RevisedDiscussion: the STA that is addressed by MU-RTS TXS will not set its NAV per the MU-RTS TXS since the STA is the recipient of the frame. However MU-RTS TXS may not be the first frame of the TXOP where the MU-RTS TXS is the TXOP holder. In this case, the STA’s intra-BSS NAV timer is not 0. This can be addressed by ignoring the intra-BSS NAV when a STA transmit frames within allocated duration by MU-RTS TXS.TGbe editor to make changes in 11-21/1509r2 under CID 5141 |
| 5903 | 246 | 5 | It should be specified which types of frames and settings that can be used during allocation duration.For example TXOP Sharing Mode subfield equal to 2, the peer non-AP STA (which the scheduled STA talks to in the allocation duration) may understand AP as the TXOP holder. The scheduled STA should not initiate a RTS/CTS exchange with the peer STA for hidden node protection within allocation durationFor another example, if the scheduled STA uses control frames with BW signaling TA talking to a peer STA, another STAx in the same BSS may set basic NAV. This prevents AP sending TF to this STAx later in the TXOP. | Specifiy the types/settings of the frames that can be used in the allocation duration | RevisedDiscussion: Not allowing RTS/CTS between scheduled STA and the P2P peer STA is too restrictive. The RTS/CTS may be needed to avoid the interference from the neighbors of the peer STA. The cpmmenter is right that if the TXOP include the scheduled P2P frame exchnges that are followed by UL MU frame exchnges, the solicited STAs by the Trigger frames may not be able to transmit the TB PPDUs. The reason is that the P2P frame exchanges will set inter-BSS NAV timer. Another issue is that if the duration of P2P frame exchange is set per the duration of MU RTS TXS, the neighbors of P2P peer STA (not the neighbor of the STA solicited by MU-RTS TXS) will not be able to transmit its frame at the end of P2P frame exchanges. The related solution should be defined as following: the Duration field of the P2P frame exchange is set such that the NAV based on the Duration of frames of TXOP sharing will be 0 at the end of allocated TXOP sharing duration. TGbe editor to make changes in 11-21/1509r2 under CID 5903 |
| 5964 | 243 | 53 | The STA that is invited to join the TXOP sharing P2P transmission and is not associated with the AP may set its NAV per revceived MU-RTS TXOP sharing Trigger frame and can't do the P2P frame exchange. | Solve the issue. | RevisedDiscussion: Generally agree with the commenter. The issue can addressed through: if the duration value in MU-RTS TXS doesn’t cover the P2P frame exchange, it is safe for the solicited STA addressed by MU-RTS TXS to transmit RTS for protecting P2P frame exchange. Another observation is that the STA solicited by MU RTS TXS may transmit Trigger frame to P2P STA within allocated time to the STA. However the P2P STA can’t respond with TB PPDU or CTS if it’s NAV timer is not 0. With the proposed method, the P2P STA solicited by Trigger frame can transmit TB PPDU or CTS.TGbe editor to make changes in 11-21/1509r2 under CID 5964 |
| 6073 | 243 | 53 | when a STA does P2P frame exchanges within the TXOP allocated by the AP, its peer STA may not be able to send responding frame. The reason is that the peer STA have non-zero NAV being set by the received frame from the AP. | Address the issue raised by the comment. | RevisedDiscussion: Generally agree with the commenter. The issue can addressed through: if the duration value in MU-RTS TXS doesn’t cover the P2P frame exchange, it is safe for the solicited STA addressed by MU-RTS TXS to transmit RTS for protecting P2P frame exchange. Another observation is that the STA solicited by MU RTS TXS may transmit Trigger frame to P2P STA within allocated time to the STA. However the P2P STA can’t respond with TB PPDU or CTS if it’s NAV timer is not 0. With the proposed method, the P2P STA solicited by Trigger frame can transmit TB PPDU or CTS.TGbe editor to make changes in 11-21/1509r2 under CID 5964 |
| 4823 | 246 | 59 | Clarify how the scheduled STA can use TXOP protection mechanism to talk to its peer STA | As in comment. | RevisedDiscussion: Generally agree with the commenter. The issue can addressed through: if the duration value in MU-RTS TXS doesn’t cover the P2P frame exchange, it is safe for the solicited STA addressed by MU-RTS TXS to transmit RTS for protecting P2P frame exchange. Another observation is that the STA solicited by MU RTS TXS may transmit Trigger frame to P2P STA within allocated time to the STA. However the P2P STA can’t respond with TB PPDU or CTS if it’s NAV timer is not 0. With the proposed method, the P2P STA solicited by Trigger frame can transmit TB PPDU or CTS.TGbe editor to make changes in 11-21/1509r2 under CID 5964 |
| 6980 | 246 | 9 | When the non-AP STA transmits P2P PPDU to a peer STA, the PPDU may failed because medium of the peer STA never cleared before. So, it is recommended to allow to use protection mechanism(such as RTS/CTS exchange) between the non-AP STA and the peer STA. | Provide P2P PPDU protection mechanisms for non-AP STA and peer STA. | RevisedDiscussion: Generally agree with the commenter. The issue can addressed through: if the duration value in MU-RTS TXS doesn’t cover the P2P frame exchange, it is safe for the solicited STA addressed by MU-RTS TXS to transmit RTS for protecting P2P frame exchange. Another observation is that the STA solicited by MU RTS TXS may transmit Trigger frame to P2P STA within allocated time to the STA. However the P2P STA can’t respond with TB PPDU or CTS if it’s NAV timer is not 0. With the proposed method, the P2P STA solicited by Trigger frame can transmit TB PPDU or CTS.TGbe editor to make changes in 11-21/1509r2 under CID 5964 |
| 6555 | 245 | 32 | For a P2P comunication, how the AP can be aware of the end of the P2P transmission ? | The STA1 may send a CF-END frame to the AP to end the P2P transmission. | RejectedDiscussion: CF-End is dangerous since the the recipient of the CF-End will set its NAV to 0. |

**35.2.1.3 Triggered TXOP sharing procedure**

**35.2.1.3.3 Non-AP STA behavior**

***TGbe editor: add the following text at the end of 35.2.1.3.3*:**

(#5141) After sending the CTS solicited by MU-RTS TXS from the associated AP, the STA that sends the responding CTS shall ignore the NAV that is set by the AP within the time allocation signaled in the MU-RTS TXS Trigger frame.

(#5903) After sending the CTS solicited by MU-RTS TXS, the STA shall set the Duration field of its frame to P2P peer STA with the value that indicates the time no later than the ending time of the PPDU carrying MU-RTS TXS plus the Allocation Duration field in soliciting MU-RTS TXS. Within the allocated time by an MU-RTS TXS Trigger frame with TXOP Sharing Mode subfield equal to 2, the addressed STA by the MU-RTS TXS Trigger frame may transmit QoS Data frames, Management frames and the frames that assists the transmission of QoS Data frames and Management frames, e.g. RTS frame, the frames for sounding.

NOTE---- With the Duration rule defined here, the Basic NAV of a STA in the same BSS as the AP will become 0 if the Basic NAV timer is set per the P2P transmission frames during the allocated time period, so the STA can do the transmission in the remain TXOP that after allocated time period due to a non-zero Basic NAV value.

(#5964) An AP may set the Duration field of its MU-RTX TXS to a value to protect the solicited CTS where the value of the Duration field is no more than the sum of 2\* SIFS and the transmit time of the PPDU that carries the solicited CTS. A first STA that receives soliciting MU-RTS TXS and tries to do the frame exchanges with a P2P peer STA may use RTS/CTS to protect the frame exchanges with the P2P peer STA as defined below:

* If the Duration field in the solicited MU-RTS and each frame transmitted by the AP before MU-RTS (if any) in the TXOP only protects the the following CTS, the first STA may transmit RTS to solicit CTS from the P2P peer STA.