IEEE P802.11  
Wireless LANs

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| 11be D3.0 CR for Miscellaneous CIDs | | | | |
| Date: 2023-04-21 | | | | |
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Abstract

This submission proposes resolutions for the following CIDs:

15392, 16421, 16422, 17282, 17839, 15479, 17953, 16171, 16002, 15516

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: Add CID 15516
* Rev 2: Add Green tag and do editorial reivison based on the suggestion from Alfred
* Rev 3: Revise resolution for CID 15479

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 D3.0 Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbe D3.0 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** | **Commenter** | **Clause** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 15392 | John Wullert | 13.7.1 | 448.65 | Text refers to "target AP" when other such references have been changed to "Target FTR" | Replace "target AP" with "target FTR". Also, on page 449, line 6, replace "AP" with "FTR". | Revised –  Agree in principle of the commenter. Note that only the link used to exchange FT action frame needs to verify operating channel.  TGbe editor to make the changes shown in 11-23/0678r3 under all headings that include CID 15392 |
| 16421 | Jeongki Kim | 35.3.24.4 | 586.53 | "then the corresponding PM mode change and power state change for the STA of the intended link shall start as soon as practical after the individually addressed TWT information frame exchange" text may not be correct in some cases. For example, when an intended STA is in doze state, the power state change from doze to awake will happen at the time (Next TWT) indicated in the TWT information frame rather than "as soon as the frame exchagnes". Some text should be clarified in this subclause for correct operation. | Clarify the corresponding text with the correct flexible wake time operation | Revised -  We revise the text to focus on the required immediate change.  TGbe editor to make the changes shown in 11-23/0678r3 under all headings that include CID 16421 |
| 16422 | Jeongki Kim | 35.3.24.4 | 586.53 | What if the intended STA on the intended link transitions from doze state to awake state later than the rescheduled TWT start time indicated in the TWT information frame? How does the AP decide the rescheduled TWT start time of an intended STA without considering the STA's power state swithching delay? Low-end device may have longer transition delay than high-end device. | Describe how to reschedule the next TWT of the intended STA considering MLD's switching delay. | Revised -  We revise the text to focus on the required immediate change.  TGbe editor to make the changes shown in 11-23/0678r3 under all headings that include CID 16421 |
| 17282 | Zinan Lin | 35.3.24.3 | 586.33 | What does "suspended " mean here? All broadcast TWT schedules on all inks need to be stopped? What is the definition of "starting as soon as practical" ? | Please clarify it | Rejected –  “suspended” operation is the same as what is defined in baseline 26.8.4.3 TWT Information frame exchange for broadcast TWT. See below. The only difference is that the timing is “as soon as practical”. “as soon as practical” means literally as soon as it is practical for the receiver to change the operation in another link.  *A TWT scheduled STA that receives a TWT Information frame that contains an All TWT subfield equal to 1 follows the rules defined in 26.8.3.3 (Rules for TWT scheduled STA), except that the TWT scheduled STA shall consider all the broadcast TWT schedules as suspended and shall resume each broadcast TWT schedule at the first TWT that occurs not earlier than the Next TWT subfield value contained in the received TWT Information frame.* |
| 17839 | Yunbo Li | 35.3.24.3 | 586.29 | RTWT is desiged for low latency traffic, while a non-RTWT broadcast TWT may mainly for power save. Considering the different use cases, it is better to distiguish RTWT from non-RTWT. | when a MLD intend to suspend broadcast TWTs, the spec should provide a way to identify all TWT, all TWT except R-TWTs, or all R-TWTs. | Rejected –  The cited texts do not change what is defined in baseline except relaxing the timing of operation. The commenter is suggesting a new proposal even when the management frame is not sent in different link. As a result, it is not specifically relevant to the cited texts. |
| 15479 | Xiandong Dong | 35.3.24.3 | 586.25 | The scheduled STA intend to be a member of an individual Broadcast TWT schedule by the <broadcast TWT ID, MAC address> tuple. When the shceduling AP is an AP MLD, one of the affiliated AP broadcasts the Broadcast TWT schedules in Beacon or Probe Response frame, the other non-AP STA affiliated with the non-AP MLD that is not on the same link of the transmitting AP cannot become the member of the Broadcast TWT schedules. | The broadcast TWT agreement between an AP MLD and a non-AP MLD should be specified. The Broadcast TWT elemment should indicate the applicable links of each TWT schedule indicated by the Broadcast TWT ID. Then each non-AP STA affiliated with a non-AP MLD can request to be a member of the corresponding TWT schedule. | Rejected –  A broadcast TWT schedule on one link only applies to the affiliated STA on the corresponding link. However, AP MLD can indicate that broadcast TWT schedules in different links are aligned, and scheduled STA in different links can join the membership separately as described below.  *(#15892)A TWT scheduling AP affiliated with an AP MLD, while announcing a broadcast TWT schedule in the AP’s BSS, may indicate whether the schedule is an aligned schedule. An aligned schedule is a broadcast TWT schedule that is available across multiple links such that the target wake times of the schedules on the multiple links are aligned. Other TWT parameters of the aligned schedules on those multiple links remain the same as each other.*  *(#15892)TWT scheduled STAs affiliated with a non-AP MLD that are interested in joining an existing aligned schedule on multiple links may send their requests to join the schedule on those links separately.* |
| 17953 | Yuchen Guo | 35.3.14.2 | 547.19 | For the individually addressed MMPDU, in order to enable the cross-link delivery, the AAD construction should be the same as the one for the individually addressed data frame. And if the individually addressed MMPDU is link-specific, then a MLO Link Information element should be included within the frame body. | As in comment. | Rejected –  This has been discussed in 11-20/1545r1, we quote the relevant texts below.  “Proposed solution focuses on individually addressed Data frames. Use cases do not compel a change for handling Management frames.” |
| 16171 | Rojan Chitrakar | 11.20.6.5 | 388.29 | TDLS off-channel switching to 6 GHz needs to ensure the requested off-channel is safe to be used (e.g. there are no licensed users operating on the channel etc.). | Add rules to ensure that non-AP STA checks that the off-channel in 6 GHz is safe to be used. E.g., one option is to get permission from its associated AP on the existing channel, whether it is allowed to switch to the new off-channel. | Rejected –  The commenter comments a problem that is not specific to 11be but could be relevant for all legacy devices that work on 6 GHz. As a result, the comment seems to be better addressed in revme rather than tgbe. The commenter is encouraged to submit the comment in revme. |
| 16002 | Binita Gupta | 9.4.1.9 | 207.29 | An AP MLD can reject request for a link for an ML setup either because the corresponding affiliated AP has been removed or will be removed soon. There is no existing status code which can provide this specific reason for rejection to the non-AP MLD. | Add a new status code to indicate rejection of association for a link for which corresponding AP is either removed or is being removed. "DENIED\_AP\_IS\_REMOVED\_OR\_BEING\_REMOVED" | Revised –  If the requested link does not exist anymore, it seems to be weird to provide status code, link ID and complete per-STA profile. The only possible option is just not to include per-STA profile of the AP that does not exist. Note that it is the same as non-MLO. Specifically, when a frame is sent to an AP that does not exist, then there is simply no response. We do corresponding spec text change.  We also add the status code for “DENIED\_AP\_IS\_BEING\_REMOVED”, so the client know it may add the link later.  TGbe editor to make the changes shown in 11-23/0678r3 under all headings that include CID 16002 |
| 15516 | Chaoming Luo | 13.11.2 | 459.41 | TWT, r-TWT and TID-to-Link mapping should be allowed to be negotiated in FT resource request protocol. | Add TWT, r-TWT and TID-to-Link mapping in Table 13-3 | Revised –  Individual TWT, broadcast TWT, and TID-to-link mapping can already be negotiated during (re)association request/response exchange.  r-TWT follows broadcast TWT procedure, so can also be negoatied during (re)association request/response exchange. We simply clarify the texts.  ***26.8.3 Broadcast TWT operation***  ***26.8.3.1 General***  *A TWT scheduling AP may include a TWT element with the Negotiation Type subfield equal to 3 in a (Re)Association Response frame or in a TWT setup frame to assign the recipient STA to a broadcast TWT schedule without having received a request from the STA to become a member of the broadcast TWT schedule if that STA has set the Broadcast TWT Support field of HE Capabilities element it transmits to 1.*  ***26.8.3.3 Rules for TWT scheduled STA***  *A TWT scheduled STA may request to become a member of a broadcast TWT by transmitting a frame to its associated AP that contains a TWT element with the Negotiation Type subfield set to 3 and the TWT Setup Command field set to Request TWT, Suggest TWT, or Demand TWT. The TWT Parameter set indicates the Broadcast TWT ID of the broadcast TWT that the STA is requesting to join. See Table 26-7 (Broadcast TWT membership exchanges(11ax)).*  TGbe editor to make the changes shown in 11-23/0678r3 under all headings that include CID 15516 |

**Discussion: None**

*TGbe editor: Change Clause 13.7.1 FT reassociation in an RSN as follows (track change on):*

**13.7.1 FT reassociation in an RSN**

(…existing texts…)

If dot11RSNAOperatingChannelValidationActivated is true and the FTO indicates OCVC capability,

target FTR(#15392) shall ensure that OCI subelement of the FTE matches by ensuring that all of the following are true

* OCI subelement is present
* Channel information in the OCI matches the current operating channel parameters of the link where the (Re)Association Request/Response frames are exchanged(#15392) (see 12.2.9 (Requirements for Operating Channel Validation))

Otherwise, the target FTR(#15392) shall reject the Reassociation Request frame with status code STATUS\_INVALID\_FTE

(…existing texts…)

If dot11RSNAOperatingChannelValidationActivated is true and the target FTR(#15392) indicates OCVC capability,

FTO shall ensure that OCI subelement of the FTE matches by ensuring that all of the following are true

* OCI subelement is present
* Channel information in the OCI matches current operating channel parameters of the link where the (Re)Association Request/Response frames are exchanged(#15392) (see 12.2.9 (Requirements for Operating Channel Validation))

Otherwise, the FTO rejects the Reassociation Response frame by discarding the frame.

(…existing texts…)

*TGbe editor: Change Clause 35.3.24.4 Flexible wake time operation as follows (track change on):*

**35.3.24.4 Flexible wake time operation**

Between an AP MLD and a non-AP MLD associated with the AP MLD, if an individually addressed TWT information frame for flexible wake time, which is intended for one STA affiliated with the MLD with a setup link, is received by another STA affiliated with the MLD with a setup link, then the corresponding immediate(#16421) PM mode change and power state change for the STA of the intended link as described in 26.8.4.4 (TWT Information frame exchange for flexible wake time) shall start as soon as practical after the individually addressed TWT information frame exchange rather than immediately.

Between an AP MLD and a non-AP MLD associated with the AP MLD, if an individually addressed TWT information frame for flexible wake time, which is intended for one STA affiliated with the associated MLD with a setup link, is transmitted to another STA affiliated with the associated MLD with a setup link and an acknowledgement in response to the TWT information frame is received by the transmitting STA affiliated with the MLD, then the corresponding immediate(#16421) PM mode change and power state change for the STA of the intended link as described in 26.8.4.4 (TWT Information frame exchange for flexible wake time) shall start as soon as practical after the individually addressed TWT information frame exchange rather than immediately.

*TGbe editor: Change Clause 9.4.1.8 Status Code field as follows (track change on):*

* + - 1. **Status Code field**

***Change the Status Code 18 and insert the following new rows (starting from 130) to*** [***Table 9-78***](#bookmark93)[***(Status codes)***](#bookmark93) ***while maintaining the numerical order and updating the reserved range (not all lines shown):***

**Table 9-78—Status codes**

|  |  |  |
| --- | --- | --- |
| **Status code** | **Name** | **Meaning** |
| … | … | … |
| 18 | REFUSED\_BASIC\_RATES\_MIS- MATCH | Association denied due to requesting STA not supporting all of the data rates in the BSSBasicRateSet parameter, the Basic HT-MCS Set field of the HT Operation param- eter, the Basic VHT-MCS And NSS Set field in the VHT Operation parameter, ~~or~~ the Basic HE-MCS And NSS Set field in the HE Operation parameter, or the Basic EHT-MCS And NSS Set field in the EHT Operation parameter. |
| … | … | … |
| 130 | DENIED\_STA\_AFFILIAT- ED\_WITH\_MLD\_WITH\_EXIST- ING\_MLD\_ASSOCIATION | Association denied because the requesting STA is affili- ated with a non-AP MLD that is associated with the AP MLD. |
| 131 | EPCS\_DENIED\_UNAUTHORIZED | EPCS priority access denied because the non-AP MLD is not authorized to use the service. |
| 132 | EPCS\_DENIED\_OTHER\_REASON | EPCS priority access denied due to a reason outside the scope of this standard. |
| 133 | DENIED\_TID\_TO\_LINK\_MAPPING | Request denied because the requested TID-to-link map- ping is unacceptable. |
| 134 | PREFERRED\_TID\_TO\_LINK\_MAP- PING\_SUGGESTED | Preferred TID-to-link mapping suggested. |
| 135 | DENIED\_EHT\_NOT\_SUPPORTED | Association denied because the requesting STA does not support EHT features. |
| 139 | DENIED\_LINK\_ON\_WHICH\_THE\_ (RE)ASSOCIATION\_REQUEST\_ FRAME\_IS\_ TRANSMIT- TED\_NOT\_ACCEPTED(#16789) | Link not accepted because the link on which the (Re)Association Request frame is transmitted is not accepted. |
| 140 | EPCS\_DENIED\_VERIFICATION\_- FAILURE | EPCS priority access is temporarily denied because the receiving AP MLD is unable to verify that the non-AP MLD is authorized for an unspecified reason. |
| 141 | DENIED\_OPERATION\_PARAME- TER\_UPDATE | Operation parameter update denied because the requested operation parameters or capabilities are not acceptable. |
| <ANA> | DENIED\_AP\_IS\_BEING\_REMOVED | Denied because the AP is being removed(#16002) |

*TGbe editor: Change Clause 35.3.5.1 as follows (track change on):*

**35.3.5.1 Multi-link (re)setup procedure**

(…existing texts…)

NOTE 4—The link requested by the non-AP MLD might not exist while the AP MLD prepares the (Re)Association Response frame because the AP MLD has removed the corresponding affiliated AP (see 35.3.6.3 (Removing affiliated APs(#18115))) in which case the AP MLD might not include the Per-STA Profile subelement for the(#16002) requested link(#15982).

(…existing texts…)

*TGbe editor: Change Clause 35.3.5.4 as follows (track change on):*

**35.3.5.4 Usage and rules of Basic Multi-Link element in the context of multi-link (re)setup, authentication, and FT action frame exchange between two MLDs**

(…existing texts…)

If there is other requested link(s) in addition to the link on which the (Re)Association Request frame was transmitted, and the other requested link(s) exist(#16002), the Basic Multi-Link element carried in the (Re)Association Response frame shall contain the Link Info field, and for each requested link (if the requested link exists) (#16002), the Link Info field shall contain the corresponding Per-STA Profile subelement(s).

(…existing texts…)

*TGbe editor: Change Clause 35.8.2 R-TWT membership setup as follows (track change on):*

**35.8.2 R-TWT membership setup**

(#15240)An R-TWT membership is established using the same procedure used to set up a broadcast TWT membership as described in 26.8.3 (Broadcast TWT operation) except that the broadcast TWT element(s) carried in the TWT Setup frame (see 9.6.24.8 (TWT Setup frame format)) or the (Re)Association Request frame (see 9.3.3.5 (Association Request frame format) and 9.3.3.7 (Reassociation Request frame format)) or the (Re)Association Response frame (see 9.3.3.6 (Association Response frame format) or 9.3.3.8 (Reassociation Response frame format)) (#15516) include one or more Restricted TWT Parameter Set fields as described in 9.4.2.199 (TWT element)(#15830).

An R-TWT scheduling AP should set the Trigger field to 1 in the Restricted TWT Parameter Set field(s) it transmits.

When included in an individually addressed TWT Setup frame or (Re)Association Response frame transmitted by an R-TWT scheduling AP or included in an individually addressed TWT Setup frame or (Re)Association Request frame transmitted by an(#15516) R-TWT scheduled STA, the Restricted TWT Traffic Info Present subfield of the Broadcast TWT Info field included in a Restricted TWT Parameter Set field shall be set to 1.

(…existing texts…)