IEEE P802.11  
Wireless LANs

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| Proposed CR for Clause 35.3.16.6. Sync PPDU start time | | | | |
| Date: 2022-09-06 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Dmitry Akhmetov | Intel Corporation |  |  | Dmitry.akhmetov@intel.com |
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Abstract

This submission proposes comment resolutions for CIDs to 35.3.16.6 Start time sync PPDUs medium access for LB266 on 11be D2.0:

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12283

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12426

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12663

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12880

12881

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13956

Revisions:

* Rev 0: Initial version of the document.
* Rev 1: after clarification from commenter, changed resolution for CID13956; +minor changes in resolution descriptions
* Rev 2: added extra explanation for CID13956; re-arranged CIDs order for better representation
* Rev 3: minor editorial changes in CR10507, 11250, fixing some typos

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| **CID** | **Commenter** | **Comment** | **Proposed Change** | **Resolution** |
| 10252 | John Wullert | There is a problem with subject-verb agreement in the second sentence of item 2, which seems to be the result of a missing "may". | Revise to "A STA with backoff counter that has already reached zero may initiate transmission only following condition 1b). | Accepted |
| 12664 | Arik Klein | Need to replace the "initiate" with "may initiate" in the following sentence: "A STA with backoff counter that has already reached zero initiate transmission only following condition 1b)" | Revise the sentence as follows: "A STA with backoff counter that has already reached zero may initiate transmission only following condition 1b)" | Accepted |
| 10507 | Eldad Perahia | "already reached zero initiate" | initiates | Revised  Changed the text following other similar commets (to use normative word “may”)  **TGbe editor:** Apply the changes tagged with #10507 in this document |
| 10253 | John Wullert | Typo - "choose" should be "chose" | Replace "choose" with "chose" | Accepted |
| 12665 | Arik Klein | typo: replace "choose" with "chooses" in the following sentence:" A STA with backoff counter that has already reached zero and that choose not to transmit following condition 1b)...." | Revise the sentence as follows:" A STA with backoff counter that has already reached zero and that chooses not to transmit following condition 1b)...." | Accepted |
| 13930 | Ming Gan | change "of" to "affiliated with" | change "of" to "affiliated with" | Accepted |
| 13931 | Ming Gan | change "of" to "affiliated with" | change "of" to "affiliated with" | Accepted |
| 12663 | Arik Klein | Need to use a unified terminology along the TGbe spec, and replace "of" with "affiliated with" in the following sentence: "A STA of an MLD operating on a link that is part of an NSTR link pair for that MLD..." | Please revise the sentence as follows: "A STA affiliated with an MLD operating on a link that is part of an NSTR link pair for that MLD..." | Accepted |
| 11448 | Gaurang Naik | Replace 'STA of an MLD' with 'STA affiliated with an MLD'. Similarly, replace 'STA of an MLD' with 'STA affiliated with an MLD' on L46. | As in comment | Accepted |
| 10254 | John Wullert | The phrase "implementation specific EDCAF" is not clear. What is implementation specific is how the STA selects which EDCAF to use. | Rephrase as "The STA that initiates transmission on that link following condition a) or b), and has one or more EDCAF backoff counters that already reached zero shall choose only one EDCAF for the transmission. The basis for selection is implementation specific." | Accepted |
| 10255 | John Wullert | There is a problem with subject-verb agreement: verb should be "detects" | Revise to "...after it detects the transition of the medium from busy to idle." | Accepted |
| 12667 | Arik Klein | typo: replace "detect" with "detects" in the following sentence: "A STA with backoff counter that has already reached zero on a link and has a frame available for transmission shall follow channel access procedures described in 10.23.2.4 (Obtaining an EDCA TXOP) after it detect medium transition from busy to idle." | Revise the sentence as follows: "A STA with backoff counter that has already reached zero on a link and has a frame available for transmission shall follow channel access procedures described in 10.23.2.4 (Obtaining an EDCA TXOP) after it detects medium transition from busy to idle." | Accepted |
| 10899 | Akira Kishida | "Each STA... shall ensure that the EDCA rules on each link permit access to the medium on all the links at the time of issuance of the PHY-TXSTART.request for each link." It is not clear that which entity align the start time of each link. It should be clarified that the MLD shall issue the PHY-TXSTART.request to each link. | "Each STA... shall ensure that the EDCA rules on each link permit access to the medium on all the links at the time of issuance of the PHY-TXSTART.request from the MLD to each link" | Rejected  Per Clause 8.3.5.5 PHY-TXSTART.request primitive is a request of a MAC sublayer to the PHY to initiate transmission.  Therefore MLD does not request any MAC of a STA to initiate transmission, but individual MAC of a STA does |
| 12283 | KENGO NAGATA | "Each STA... shall ensure that the EDCA rules on each link permit access to the medium on all the links at the time of issuance of the PHY-TXSTART.request for each link." It is not clear that which entity align the start time of each link. It should be clarified that the MLD shall issue the PHY-TXSTART.request to each link. | "Each STA... shall ensure that the EDCA rules on each link permit access to the medium on all the links at the time of issuance of the PHY-TXSTART.request from the MLD to each link" | Rejected  Per Clause 8.3.5.5 PHY-TXSTART.request primitive is a request of a MAC sublayer to the PHY to initiate transmission.  Therefore MLD does not request MAC of any STA to initiate transmission but MAC of an individual STA does |
| 11250 | Peshal Nayak | How long can the STA keep its backoff at zero. | The spec needs to define how long the STA can keep its backoff at zero. | Rejected.  There is no restriction on how long a STA can keep its backoff at zero. The amount of “wait time” is dictated by internal logic of a given implementation. |
| 12387 | Rojan Chitrakar | It would help to have an example with figure to understand the mechanism. | Provide an example with figure to illustrate the mechanism. | Rejected.  A commenter failed to identify a technical issue and failed to provide sufficient details that would satisfy the commenter |
| 12409 | Juseong Moon | When NSTR link pairs are more than 2, more description is requied to cover more cases including backoff status. | As in comment | Rejected  In hypothetical case when there are more than 2 NSTR link pairs, the STAs of such MLD follow the procedure for each pair. To synchronize transmission across more than 2 links, STAs of an MLD shall ensure that EDCA rules on each link permit access to the link using procedure in 35.3.16.6. |
| 12414 | Juseong Moon | When there are multiple EDCAF backoff counters that already reached zero and one EDCAF is chosen with implementation specific method, it is not clear what the expected behavior for the rest of EDCAFs with zero backoff counter. Do they re-invoke the backoff procedure with doubled CW value assuming an internal collision? Clear description on the post procedure of implementation specific one EDCAF selection is required. | As in comment | Rejected  The behavior of the “other” EDCAFs thar are not did not gain EDCA TXOP is covered by bullet (3) and paragraph on line 17.  Per (3) it may keep its backoff counter at zero. If an EDCAF is not selected for transmission, it either may chose to keep counter at zero or invoke backoff procedure.  A STA after transmission from selected EDCAF will observe (mostlikely) medium BUSY condition which eventually change to IDLE. Per paragraph on line 17, this will trigger behaviour described in 10.23.2.4 |
| 12880 | Kazuto Yano | It is not clear whether the step 2) is valid only while the medium keeps idle (i.e., the STA becomes free from this constraint when the medium becomes busy), or not (i.e., the STA still can initiate transmission only following condition 1b) even after the medium becomes busy). Please specify it. | As in comment. | Rejected  The paragraph on line 17 clarify that:  “A STA with backoff counter that has already reached zero on a link and has a frame available for transmission shall follow channel access procedures described in 10.23.2.4. (Obtaining an EDCA TXOP) after it detects medium transition from busy to idle” |
| 12881 | Kazuto Yano | It is not clear whether the backoff counter that has already reached zero is treated still zero after the medium becomes busy, or not (i.e., a new value is randomly set). Please specify it. | As in comment. | Rejected  The paragraph on line 17 clarify that:  “A STA with backoff counter that has already reached zero on a link and has a frame available for transmission shall follow channel access procedures described 10.23.2.4. (Obtaining an EDCA TXOP) after it detects medium transition from busy to idle” |
| 12426 | Yongho Kim | Because end time shall be aligned in case of non-AP STAs' sync transmission, MPDU transmitted on one link might need padding to align the end time with the other link's transmission. Mult-TID A-MPDU with the TID of the selected EDCAF and the other TIDs whose backoff counter reached zero is more efficient than just padding. In order to allow flexibility in forming multi-TID A-MPDU with different ACs, multi-TID A-MPDU construction rule needs to be eased to construct multi-TID A-MPDU regardless of AC priority. | As in comment | Revised  The use of ACs, other than AC that the AC associated with the EDCAF that gains an EDCA TXOP is governed by clause 10.23.2.7 Sharing an EDCA TXOP.  Modified the text in to align with the text in clause 10.23.2.7 “Sharing an EDCA TXOP”  **TGbe editor:** Apply the changes tagged with #13956 in this document |
| 12441 | Ryuichi Hirata | In 11-22/0554r1, an issue was raised regarding current start time sync PPDUs. However, it was not treated due to lack of time. | Revisit 11-22/0554r1 and apply the resolution. | Rejected  A commenter failed to identify a technical issue with the current spec text  We had the initial discussion in document 0974r4 with 21Y/34N count.  During CC36 comment resolution we agreed to reassign related comment to the commenter to address it in a separate document.  Suggest the commenter to present contribution 0554r1 to resolve problem/issue stated in 0974r4r |
| 12666 | Arik Klein | Rephrase the following sentence for better understanding, as proposed: "The decision to choose to not transmit when the backoff counter of the STA reaches zero as in 2) or to perform a new backoff procedure to be allowed to initiate transmission following condition 1a) as in 3) is implementation specific" | Revise the sentence as follows: "The decision whether to avoid transmission when the backoff counter of the STA reaches zero as in 2) or to perform a new backoff procedure to be allowed to initiate transmission following condition 1a) as in 3) is implementation specific" | Rejected.  Author believes that existing text is clear to understand, and no change is necessary  The Text in Note 2 “choose to not transmit” refers specifically to text in bullet 2):  “may choose to not transmit” |
| 13932 | Ming Gan | what does "only" mean? Could the STA initiate transmission by performing a new backoff procedure | clarify "only" or remove it | Rejected.  The “only” refer to a case when STA counted BK down to zero and it chose to not transmit. Now STA is in “wait” and the only way to initiate transmission is through condition 1b). STA on this link may decide not to use condition 1b) for transmission at any moment of time, in such a case it need to perform new backoff procedure as this is stated in 3).  This baseline of Sync Start procedure |
| 13956 | Geonjung Ko | Start time sync procedure is used for a non-AP MLD associated with an NSTR mobile AP MLD, regardless of whether the non-AP MLD is operating on an NSTR link pair. | Extend the procedure to a non-AP MLD associated with an NSTR mobile AP MLD. | Revised  Agree in principle.  Text in 35.3.19.1 explicitly direct non-AP MLD to use Sync Start time procedure when communicating with NSTR mobile AP MLD (with some limitations) However text in 35.3.16.6 limit the use of mechanism to MLDs operating on an NSTR link pair of that MLD  Added Note 4 to clarify  Essentially, 35.3.16.6 describe the procedure for an MLD operating on NSTR pair of link. In case of non-AP MLD assoicated to NSTR mobile MLD (as in 35.3.19.1), the pair primary and non-primary links in an NSTR link pair for NSTR mobile MLD. For non-AP MDL, associated to mobile MDL, that pair of links may be a regular STR pair of link (i.e. w/o NSTR restrictions). For the purpose of sync channel access on both primary and non-primary links for non-AP MLD shall treat that pair of links as NSTR link pair for that non-AP MLD    **TGbe editor:** Apply the changes tagged with #13956 in this document |

**TGbe Editor to make the following changes in Subclause 35.3.16.6: of Draft 2. 1.1**

**35.3.15.6 Start time sync PPDUs medium access**

Each STA affiliated with an MLD(#11448, 12663, 13930)operating on a pair of NSTR links for that MLD that aligns the start times of PPDUs scheduled for transmission on more than one link shall ensure that the EDCA rules on each link permit access to the medium on all the links at the time of issuance of the PHY-TXSTART.request for each link.

A STA affiliated with an MLD(#11448, 12663, 13931)operating on a link that is a part of an NSTR link pair for that MLD shall follow the channel access procedure described below:

1. The STA may initiate transmission on a link when the medium is idle as indicated by the physical and virtual CS mechanisms and one of the following conditions is met:
2. The STA obtained an EDCA TXOP following procedure in 10.23.2.4 (Obtaining an EDCA TXOP)
3. The backoff counter of the STA is already zero, and the STA operating on the other link of NSTR link pair of the affiliated MLD obtains an EDCA TXOP following the procedure in 10.23.2.4 (Obtaining an EDCA TXOP).
4. When the backoff counter of the STA reaches zero, it may choose to not transmit and keep its backoff counter at zero. A STA with backoff counter that has already reached zero may initiate(#10252,10507,10664) transmission only following condition 1b)
5. A STA with backoff counter that has already reached zero and that chose(#10253) not to transmit following condition 1b), may perform a new backoff procedure following deferral as described in 10.23.2.4 (Obtaining an EDCA TXOP) and 10.3.4.3 (Backoff procedure for DCF) before being allowed to initiate transmission on a link following condition 1a). In such a case, CW[AC] and QSRC[AC] shall be left unchanged

NOTE 1—The backoff counters for each link count down as specified in 10.23.2.4 (Obtaining an EDCA TXOP).

NOTE 2—The decision to choose to not transmit when the backoff counter of the STA reaches zero as in 2) or to perform a new backoff procedure to be allowed to initiate transmission following condition 1a) as in 3) is implementation specific.

A STA that choose (#12665) not to transmit after the backoff counter reached zero on a link of NSTR link pair may have one or more EDCAF backoff counters with value zero on that link. The STA that initiates transmission on that link following condition a) or b), and has one or more EDCAF backoff counters that already reached zero shall choose only one (#10254)EDCAF to gain an EDCA TXOP(#12426). The basis for selection is implementation specific.(#10254)

A STA with backoff counter that has already reached zero on a link and has a frame available for transmission shall follow channel access procedures described 10.23.2.4. (Obtaining an EDCA TXOP) after it detects(#10255, 12667) medium transition from busy to idle.

The STA with backoff counter that has already reached zero and is initiating transmission following condition (b) is not mandated to initiate transmission on a slot boundary of the link on which the STA operates. The STA that is initiating transmission following condition b) shall commence the transmission no later than 4us following slot boundary of the link on which the other STA whose backoff counter reaches zero operates.

NOTE 3—The value of 4 µs is derived from aRxTxTurnaroundTime being equal to 4 µs for the purpose of this requirement

NOTE 4—When STAs affiliated with a non-AP MLD that is associated with an NSTR mobile AP MLD and APs affiliated with an NSTR mobile AP MLD intend to transmit in the nonprimary link (35.3.19.1), the non-AP MLD use pair of primary and nonprimary links that are set up by the NSTR mobile AP MLD as an NSTR link pair for that non-AP MLD. (#13956)

(25 CIDs)

SP:

Do you support to incorporate the changes proposed by the following CIDs in 11/1442r0:

10252, 10253, 10254, 10255,10507, 10899, 11250, 11448, 12283, 12387, 12409, 12414, 12426, 12441, 12663, 12664, 12665, 12666, 12667, 12880, 12881, 13930, 13931, 13932, 13956