IEEE P802.11
Wireless LANs

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| Comments Resolution for Error Recovery of NSTR MLD |
| Date: 2021-05-10 |
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Revisions:

* Rev 0: Initial version of the document.
* Rev 1-3: updated base on offline feedback
* Rev 4: updated base on Chunyu’s feedback

*In R1, after two PPDUs with end time alignment (and the PPDUs carrying the expected response frames are also with end time alignment) are transmitted by a NSTR MLD on link 1 and link 2 respectively, STA 1 affiliated with this NSTR MLD may use an IFS greater than SIFS between the ending time of PPDU carrying the successful response frame and a following PPDU within a TXOP on link 1 when PHY-RXSTART.indication is received but FCS is not correct for response frame on link 2.*

* + *STA 1 shall transmit the following PPDU only if the ED CS mechanism indicates that the medium is idle;*
	+ *The concrete value for the IFS greater than SIFS is TBD, with an upper limit of PIFS;*
	+ *The response frames are frames sent from STAs affiliated with the peer MLD in the TXOP in response to the frames carried in the previous PPDUs.*
	+ *[Motion 146, #SP346, [30] and [263]]*

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| **CID** | **Commenter** | **Clause Number(C)** | **Page** | **Comment** | **Proposed Change** | **Resolution** |
| 3325 | Yunbo Li | 35.3.13 | 141.18 | Lack of error recovery mechanism for NSTR MLD in the draft. | Add an error recovery mechanism in this subclause | **Revised** The concrete value for IFS is defined when there is at least one failure happens on links of NSTR link pair(s). **TGbe editor please implement changes as shown in doc 11-21/0826r4**  |

Discussion:

When a NSTR MLD transmit two PPDUs with ending time alignment on a NSTR link pair, if at least one of of the response of the two PPDUs is not correctly received, below IFS values should be used.

For the link that the response frame is ended earlier,

* if the response is correctly recived (it means the response frame on another link is failed), PIFS should be used so the IFS on another link could more closer to PIFS;
* if the response is not correctly recived, PIFS should be used according to exsiting rule;

In conclusion, for the link that response frame is ended earlier, PIFS shall be used.

For the link that the response frame is ended later, if the response is correctly recived, an IFS between [SIFS PIFS] can be used.

For the link that the response frame is ended later, if the response is not correctly recived, an IFS between [PIFS-4us PIFS] is good enough to cover all possible cases. The reason that the IFS shoter than PIFS is needed is that the difference between the ending time of response frame may be 8us, while the RXTXTurnaroundTime before PPDU transmission is 4us. So an IFS shorter than PIFS may needed when response frames are not correctly received both links.

More detailed analysis can be found in doc 11/21-0062r1.



1. **Introduction**

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. The introduction and the explanation of the proposed changes are 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).***

1. **Proposed spec text**

***TGbe editor: add the following subclause after 35.3.13.6(Start time sync PPDUs medium access)***

**35.3.13.7 IFS for error recovery on a NSTR link pair**

After two PPDUs with end time alignment (and the PPDUs carrying the expected response frames also have end time alignment) are transmitted by an MLD on two links that belongs to a NSTR link pair of this MLD, if the MLD intend to transmit following PPDUs on both links when failure happens on at least one of the two links, the MLD conduct the procedures in this sub-clause. Otherwise, the MLD stops transmission on a link that failure happens and continue to do multiple frame transmission on anther link, as described in 10.23.2.8(Multiple frame transmission in an EDCA TXOP).

If the MLD ensure the difference between the end times of the two PPDUs carrying the expected response frames is less than or equal to 4us, the MLD may use either SIFS or PIFS between the end time of the PPDU carrying the response frame and the following PPDU on the link where the response frame is received correctly regardless of the error status of the other link.

Otherwise, after two PPDUs with end time alignment (and the PPDUs carrying the expected response frames also have end time alignment) are transmitted by an MLD on two links that belongs to a NSTR link pair of this MLD, if a PHY-RXSTART.indication are received on both links, but the FCS is not correct for a response frame on one or both links, then:

* on the link that response frame is later ended, if the response frame is successfully received, ~~the STA on this link should use an IFS that is~~ the time from the end of the PPDU carrying the response frame to the following PPDU should be larger than or equal to SIFS and smaller than or equal to PIFS ~~between the end time of the PPDU carrying the response frame and the following PPDU~~;
* on the link that response frame is later ended, if the PHY-RXSTART.indication is received but the FCS is not correct for the response frame, ~~the STA on this link should use an IFS that is~~ the time from the end of the PPDU carrying the response frame to the following PPDU should be larger than or equal to PIFS-4us and smaller than or equal to PIFS ~~between the end time of the PPDU carrying the response frame and the following PPDU~~;
* on the link that response frame is earlier ended, ~~the STA on this link should use a~~ the time from the end of the PPDU carrying the response frame to the following PPDU should be PIFS ~~between the ending time of the PPDU carrying the response frame and the following PPDU~~.

If the time from the end of the PPDU carrying the response frame to the following PPDU be ~~When a STA intends to use an IFS that is~~ larger than SIFS and less than ~~or equal to~~ PIFS ~~before the following PPDU transmission~~ is intended to be used by a STA in an EDCA TXOP, the STA shall ensure the medium is idle through ED-based CCA before the transmission.

***End of change***