IEEE P802.11  
Wireless LANs

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| CR for Error Recovery of NSTR MLD | | | | |
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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.

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| **CID** | **Commenter** | **Clause** | **P.L** | **Comment** | **Proposed Change** | **Resolution** |
| 8196 | Yunbo Li | 35.3.14.x | 274.18 | There is a passed Motion (Motion 146, #SP346) hasn't convert into spec text. It is about error recovery when the TXOP holder STAs on a NSTR link pair of a MLD. | the solution was provided in doc 11-21/826, I volunter to continue to resove this CID. | 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 to make the changes shown in doc 21/1329r0 |

***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).***

*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]]*

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, the following 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.



Considering the crossing link information exchange delay will different in implemention. A simpler solution is also provided to relex the requirement of cross link information exchange delay, but it has a tighter requirement of PPDU end time alignment (from <=8 us to <=4 us).

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 belong to a NSTR link pair of the MLD, if the MLD intends to transmit more PPDUs on both links, when a failure happens on at least one of the two links, the MLD conducts the procedures described in this sub-clause.

If the MLD ensures that 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 next 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 the MLD, if a PHY-RXSTART.indication is received on both links, but the FCS is not correct for a response frame on one or both links, then:

* on the link that the response frame ends last, if the response frame is successfully received, the time from the end of the PPDU carrying the response frame to the next PPDU should be larger than or equal to SIFS and smaller than or equal to PIFS;
* on the link that the response frame ends last, if the PHY-RXSTART.indication is received, but the FCS is not correct for the response frame, the time from the end of the PPDU carrying the response frame to the next PPDU should be larger than or equal to PIFS-4us and smaller than or equal to PIFS;
* on the link that the response frame ends first, the time from the end of the PPDU carrying the response frame to the next PPDU should be PIFS.

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

***End of change***