IEEE P802.11
Wireless LANs

|  |
| --- |
| TDD link loss maintenance  |
| Date: 2019-March-14 |
| Author(s): |
| Name | Company | Address | Phone | email |
| Solomon Trainin  | Qualcomm |  | 972547885738 | strainin@qti.qualcomm.com |
| Alecsander Eitan | Qualcomm |  |  | eitana@qti.qualcomm.com |
| Assaf Kasher | Qualcomm |  |  | akasher@qti.qualcomm.com |
| Carlos Cordeiro  | Intel |  |  | carlos.cordeiro@intel.com |
|  |  |  |  |  |
|  |  |  |  |  |

Abstract

Resolution of CIDs: 4359, 4431

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CID** | **Page** | **Clause** | **Comment** | **Proposed Change** | **Resolution** |
| 4359 | 372.04 | 11.53.2 | "TDD channel access becomes inactive when an implementation dependent number of frames can no longer be successfully delivered"Rule is vague and not clear. | Transition to "Inactive" should rely on MaxLostBeacons and not on amount of data loss | **Revised**  |
| 4431 | 373.02 | 11.53.2 | The diagram in Figure 164 indicates association and secure authentication as result of the link loss. The initial beamforming is required to build the link for new when it is lost, however, the reestablishment of association and secure authentication may be not required. | Modify the diagram and define the case when the reassociation/authentication is not required. See submission 11-19-0280-00-00ay TDD link loss maintenance | **Revised** |

CID 4359, 4431

**Revised**

Discussion: There are few cases of the link loss:

* The beacon is sent by the AP and PCP STA periodically that provides indication to the STA about integrity of the link. In absence of the beacons for the time of MaxLostBeacons\* BI the non-AP STA may conclude that the link is lost and disassociate. The AP STA may not receive the disassociation frame and will wait forever and will not initiate the beamforming being unaware of the link loss.
* It may happen that the link is broken in direction from the non-AP STA to the AP STA. In this case the non-AP STA is aware of link loss by not getting expected acknowledgement frames. There is no indication on the AP STA side of the link loss and the STA is not able to signal the problem to the AP STA. Still the AP STA will not initiate the beamforming.

Relevant solution should provide periodical scheduled handshake that both sides are aware of link loss if the handshake fails of predefined number of attempts.

* Periodicity – once per BI
* link is lost if the handshake fails MaxLostBeacons times
* successive data traffic is part of the handshake, no need additional handshake
* MPDU (ack policy=ack) sent by AP STA at first applicable TX TDD slot is used for the mandatory handshake if no data is available to be sent by the AP STA.
* During the time needed to indicate the link loss, the STAs may continue to proceed with the beamforming if scheduled or other attempts to reestablish the link.

***TGay editor modify as follows:***

P373L4

The AP STA shall transmit at least one MPDU with Ack policy=Ack at first applicable TX TDD slot to each non-AP STA following the DMG Beacon transmission. TDD channel access is suspended if an expected MPDU transmission does not succeed within the AckTimeout (see 10.3.2.11). A beamformed link is considered lost if no successful MPDU transmission takes place during MaxLostBeacons \* BI time starting at the TX TDD slot the expected mandatory AP STA transmission is scheduled. A STA shall initiate dissociation at the indication of the link loss. The AP STA shall proceed as defined in 11.3.5.8 AP or PCP disassociation initiation procedure, and 11.3.5.9 AP or PCP disassociation receipt procedure. The AP STA shall initiate the disassociation with the Reason code set to MISSING\_ACKS. The non-AP STA shall proceed as defined in 11.3.5.6 Non-AP and non-PCP STA disassociation initiation procedures, and 11.3.5.7 Non-AP and non-PCP STA disassociation receipt procedure. The non-AP STA shall initiate the disassociation with the reason code set to REASON\_INACTIVITY. A STA may transmit the Disassociation frame at first applicable TX TDD slot following the link loss indication.

***TGay editor in the Figure 164 replace “Link Lost” by “Disassociate”***

**References:**

1. IEEE P802.11ay/D3.0, February 2019