IEEE P802.11
Wireless LANs

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| TLC Signaling |
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Abstract

Proposed language to create a mechanism in the Block Ack to signal a request by a receiver to Temporarily Limit the Connection.

The proposed changes address CIDs 21045 and 21046 of LB238 on TGax D4.0.

Changes are referenced to TGax D4.0.

**REVISION NOTES:**

**R0**:

initial

**R1**:

Add CID 16440

Update doc references

**R2**:

Update to D3.3

Update doc references

**R3**:

Update to D4.0

CIDs changed to LB238 CID 21045 and 21046

Update doc references

**R4**:

CIDs were misnumbered

Update doc references

**R5**:

Add second bit and encoding for two values one for TLC and one for Interference Mitigation Request

Modify behavioural language to reflect new bit addition and new signalled indication (IMR)

Removed the word “temporarily” from the behavioural part of the document because the language provided no further hints as to the meaning of temporarily, instead, the implication is that Temporarily is as long as the initiator wants it to be, as indicated by signalling TLC==0

3.4 abbrev+acronyms – new proposed changes, with addition of TLC and IMR expansions

10.3.2.9 – new proposed changes, allow the block ack agreement receipient to not respond to RTS at its discretion as long as it has an outstanding TLC==1 or IMR==1 with the originator.

10.26.10a – add a note at the end that mentions the recipient behaviour regarding optional CTS response with a reference to the change in 10.3.2.9 CTS and DMG CTS procedure

Update to D4.2

Update doc references

**END OF REVISION NOTES**

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 TGax Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGax Draft (i.e. they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGax Editor: Editing instructions preceded by “TGax Editor” are instructions to the TGax editor to modify existing material in the TGax draft. As a result of adopting the changes, the TGax editor will execute the instructions rather than copy them to the TGax Draft.***

**CIDs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 21046 | Matthew Fischer | 9.2.4.6a.5 | 84.30 | It would be useful to have a way to signal that the recipient of DATA MPDUs is experiencing either resource constraints or local interference that might cause a complete lack of an acknowledgement transmission and that the failure of an AMPDU originator to receive an acknowledgement when thus indicated should not be a reason to adjust the MCS for the link. | Add a signaling indication to the UPH Control to indicate that the recipient is currently resource constrained and that missing acknowledgement frames should not be construed as indicative of a poor MCS choice for the link. | Revise - TGax editor to make changes as shown in 11-18/1822r3 that are marked with CID 21046 which create a new bit in the BA control field to indicate that there is a Temporarily receive resource constraint at the transmitter of the BA. |
| 21045 | Matthew Fischer | 9.3.1.8.1 | 91.60 | It would be nice to have the ability to inform the transmitter of an AMPDU that missing acknowledgements for some MPDUs are not due to a poor MCS choice, but instead, to local interference that occurred during the AMPDU reception. An indication of such occurence should be signaled in the BA. | Add a mechanism in the BA frame, perhaps the MBA, to allow a recipient transmitting the MBA to indicate to the originator that missing acknolwedgements within the BA frame are due to local interference and not a poor MCS choice. | Revise - TGax editor to make changes as shown in 11-18/1822r3 that are marked with CID 21045 which create a new bit in the BA control field to indicate that there is a Temporarily receive resource constraint at the transmitter of the BA. |

**Discussion:**

**Proposed Changes to TGax D4.0:**

***TGax editor: within TGax D4.2, in 3.4 Abbreviations and acronyms, add the following acronyms in an appropriate location:***

**3.4 Abbreviations and acronyms**

TLC Temporarily Limited Connection

IMR Interference Mitigation Requested

**9.3.1.8.1 Overview**

***TGax editor: within TGax D4.0, in Figure 9-42 – BA Control field, change bit B5 from reserved to TLC and bit B6 to IMR, as shown, adjusting the reserved field size and bit locations as appropriate:***

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | B0 | ~~B1~~ | ~~B2~~ | ~~B3 B4~~ | B1 B4 | B5 | B6 | B7 B11 | B12 B15 |
|  | BA Ack Policy | ~~Multi TID~~ | ~~Compressed Bitmap~~ | ~~GCR Mode~~ | BA Type | TLC **(#21045)(#21046)** | IMR **(#21045)(#21046)** | Reserved | TID\_INFO |
| Bits: | 1 | ~~1~~ | ~~1~~ | ~~2~~ | 4 | 1 | 1 | 5 | 4 |

**Figure 9-42—BA Control field**

***TGax editor: within TGax D4.0, in an appropriate location within 9.3.1.8.1 Overview, insert the following paragraph:***

The TLC (Temporarily Limited Connection) subfield is set to 1 to indicate that the STA transmitting the frame containing this subfield is requesting a temporarily limited connection. The field is set to 0, otherwise. **(#21045)(#21046)**

The IMR (Intereference Mitigation Request) subfield is used to communicate a request for link activity modification. A value of 1 in this field indicates that the transmitting STA, which is the recipient in a BA agreement, is requesting the originator to employ a means of interference mitigation when transmitting frames to the recipient for the associated TID. A value of 0 in this field indicates that the transmitting STA, which is the recipient in a BA agreement, is not requesting the originator to employ a means of interference mitigation when transmitting frames to the recipient for the associated TID. **(#21045)(#21046)**

***TGax editor: within TGax D4.2, add the following text to the end of subclause 10.3.2.9 CTS and DMG CTS procedure, as shown:***

**10.3.2.9 CTS and DMG CTS procedure**

A STA that is required to transmit a CTS in response according to the rules in this subclause and that has transmitted a BlockAck frame with either or both of the IMR and TLC subfields set to 1 and that receives an RTS from the originator of the corresponding block ack agreement may refrain from transmitting the CTS when it anticipates that the transmission of MPDUs presaged by the RTS is likely to fail due to interference or resource constraints. The STA may continue this behaviour until the most recently transmitted BlockAck frames for each outstanding block ack agreements with the originator contained a value of 0 in both the IMR and TLC subfields.

***TGax editor: within TGax D4.0, insert the following editing instruction and new subclause in an appropriate location:***

***Insert a new subclause at the end of 10.26.10:***

**10.26.10a Temporarily Limited Connection Signaling (#21045)(#21046)**

An HE STA may set the TLC subfield to 1 in a Block Ack frame transmitted to an HE STA to indicate a request to the receiving STA that it should temporarily limit the rate of transmission of octets of MMPDUs and MSDUs to the transmitting STA. If the Block Ack is transmitted in response to the receipt of an A-MPDU, the lack of indication of acknowledgement of some of the MPDUs from the corresopnding A-MPDU should not be assumed by the originator to have been due to bit errors but instead to a limited resource availability at the recipient. The determination of which unacknowledged MPDUs should not be assumed to have been due to bit errors is beyond the scope of the standard.

An HE STA that is a recipient in a block ack agreement may set the IMR subfield to 1 in a BlockAck frame to request that the originator should perform interference mitigation for TXOPs that address the recipient. If the BlockAck frame containing the IMR subfield equal to 1 is transmitted in response to the receipt of an A-MPDU, the lack of indication of acknowledgement of some of the MPDUs from the corresopnding A-MPDU should not be assumed by the originator to have been due to bit errors but instead to errors induced by interference at the recipient.

An HE STA that receives a BlockAck frame with the TLC subfield equal to 1 should limit the rate of transmission to the STA that transmitted the BlockAck frame of octets of MSDUs matching the TID of the BlockAck frame. The amount of reduction in the rate of transmission is beyond the scope of the standard. A STA that receives a BlockAck frame with the TLC subfield equal to 0 should not limit the rate of transmission to the STA that transmitted the BlockAck frame of octets of MSDUs matching the TID of the BlockAck frame.

A HE STA may set the TLC subfield to 0 in a Block Ack frame transmitted to an HE STA to indicate a request to the receiving STA that it should not limit the rate of transmission of octets of MMPDUs and MSDUs to the transmitting STA.

An HE STA that receives a Block Ack with the TLC subfield equal to 0 should not limit the rate of transmission of octets of MMPDUs and MSDUs to the STA that transmitted the Block Ack.

An HE STA that receives a BlockAck frame with the IMR subfield equal to 1 should invoke interference mitigation procedures for TXOPs that include MPDUs that are addressed to the STA that transmitted the BlockAck frame. Interference mitigation includes, but is not limited to an RTS/CTS exchange with the STA that transmitted the BlockAck frame. A STA that receives a BlockAck frame with the IMR subfield equal to 0 may refrain from employing interference mitigation procedures for TXOPs at its discretion when the TXOPs include MPDUs that are addressed to the STA that transmitted the BlockAck frame.

An HE STA should set the TLC subfield to 0 and the IMR subfield to 0 in a BlockAck frame to indicate a request to the receiving STA that it should not limit the rate of transmission of octets of MSDUs to the transmitting STA and that no interference mitigation procedures are requested for TXOPs that address the STA.

Note – An HE STA that transmitted a value of 1 in either or both of the TCL and IMR subfields of a BlockAck frame can choose to not respond to an RTS from the originator as described in 10.3.2.9 (CTS and DMG CTS procedure).

**End of proposed changes.**