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**IEEE P802.11
Wireless LANs**

Ack related CRs

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Abstract

Resolved the following **120 CIDs**

11092, 11740, 11757, 11758, 11759, 11760, 11761, 11762, 11763, 11810
12143, 12486, 12487, 12488, 12489, 12630, 12631, 12826, 12827, 12828
12829, 12831, 12832, 12887, 12888, 12889, 12891, 12892, 12893, 12894
12895, 12896, 12897, 12898, 12899, 12900, 12902, 12904, 12905, 12906
12907, 12908, 12909, 12911, 13517, 13518, 13519, 13520, 13734, 13735
13736, 13737, 13738, 13739, 13740, 13741, 13742, 13743, 11086, 11089
11091, 11754, 11755, 11756, 11807, 12015, 12285, 12478, 12479, 12481
12482, 12483, 12484, 12485, 12491, 12636, 12721, 12739, 12745, 12750
12820, 12821, 12822, 12823, 12847, 12866, 12867, 12910, 12912, 12913,
12914, 13022, 13023, 13036, 13150, 13189, 13252, 13254, 13255, 13256
13257, 13258, 13260, 13262, 13263, 13264, 13265, 13266, 13269, 13270
13272, 13276, 13278, 13279, 13515, 13516, 13521, 13663, 13664, 13665

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.

CID	Commenter	Page	Comment	Proposed Change	Resolution
11092	Adrian Stephens	239.06	"sends a PPDU to an intended recipient" This is, of course, to distinguish the PPDU from one sent to an unintended recipient. Also, PPDUs are not addressed, but frames within it are. Also "transmits" is the preferred verb.	Replace sentence with: "A STA that transmits a PPDU can solicit different immediate responses to the frames the PPDU contains by using the Ack Policy field of QoS Data or QoS Null frames, the type of the frame (e.g., Action, (multi-TID) BAR, MU-BAR Trigger frame, GCR MU-BAR Trigger frame, etc.) and the EOF field setting"	Revised - Agree in principle. Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax
11740	GEORGE CHERIAN	239.20	There is an ambiguity in terminology between S-MPDU (where there is only one MPDU in a PPDU) Vs "a single MPDU (i.e., MPDU in an A-MPDU subframe with EOF = 1)". Fix it - define it in unambiguous way	As in the comment	Revised - Agree in principle. Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax
11757	GEORGE CHERIAN	239.16	Remove QoS Null from the following sentence, since this statement is inconsistent with other sections of the spec: "If the HE SU PPDU carries an S-MPDU that is a QoS Data frame or QoS Null frame with the Ack Policy..."	As in the comment	Withdraw S-MPDU allows QoS Null with Ack required.
11758	GEORGE CHERIAN	239.20	Remove QoS Null from the following sentence, since this statement is inconsistent with other sections of the spec: "If the HE SU PPDU carries a single-TID A-MPDU that includes one or more QoS Data frame or QoS Null frame..."	As in the comment	Revised - Agree in principle. Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax
11759	GEORGE CHERIAN	239.27	Remove QoS Null from the following sentence, since this statement is inconsistent with other sections of the spec: "If the HE SU PPDU carries a multi-TID A-MPDU that includes more than one QoS Data frame or QoS Null frame"	As in the comment	Revised - Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax

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11760	GEORGE CHERIAN	239.45	Remove QoS Null from the following sentence, since this statement is inconsistent with other sections of the spec: "A non-AP STA that receives an HE MU PPDU with an A-MPDU that contains QoS Data or QoS Null..."	As in the comment	Rejected - QoS Null frame is allowed in the case of S-MPDU
11761	GEORGE CHERIAN	239.49	Remove QoS Null from the following sentence, since this statement is inconsistent with other sections of the spec: "If the HE MU PPDU carries an S-MPDU that is a QoS Data frame or QoS Null frame addressed..."	As in the comment	Rejected - S-MPDU allows QoS Null with Ack required.
11762	GEORGE CHERIAN	239.53	Remove QoS Null from the following sentence, since this statement is inconsistent with other sections of the spec: "If the HE MU PPDU carries a single TID A-MPDU that includes one or more QoS Data frame or QoS Null frame..."	As in the comment	Revised - Agree in principle. Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax
11763	GEORGE CHERIAN	239.59	Remove QoS Null from the following sentence, since this statement is inconsistent with other sections of the spec: "If the HE MU PPDU carries a multi-TID A-MPDU that includes more than one QoS Data frame or QoS Null frame..."	As in the comment	Revised - Agree in principle. Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax
11810	Graham Smith	239.06	A STA that sends a PPDU to an intended recipient can solicit different immediate responses by using the Ack Policy field of QoS Data or QoS Null frames, the type of the frame (e.g., Action, (multi-TID) BAR, Ack Policy field of QoS Data or QoS Null MU-BAR Trigger frame, GCR MU-BAR Trigger frame, etc.) and the EOF field setting. "the Ack Policy field ...of the type of frame"? Is it only in these frames or is it simply 'use the Ack Policy field in the PPDU'? Clarify	Replace with "A STA that sends a PPDU to an intended recipient can solicit different immediate responses by using the Ack Policy field of the transmitted PPDU."	Revised - Updated the text Note that PPDU doesn't contain the Ack Policy. It is the MPDU that indicates the Ack Policy TGax editor shall incorporate changes in 11-18-0027-04-00ax
12143	kaiying Lv	240.59	Miss a case that the immediate response is a Multi-STA BlockAck with the ACK Type field set to 1 and the TID field set to 14. Change the sentence to " If the HE TB PPDU carries a multi-TID A-MPDU that solicits an immediate response from a single STA then the HE AP shall respond with a Multi-STA BlockAck frame with the ACK Type field set to 1 and the TID field set to 14 or the Ack Type field set to 0 carried in a DL SU PPDU format.	as comment	Revised - Agree in principle. Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax
12486	Liwen Chu	240.21	Management frame is missing from the bullet	Fix the issue mentioned in comment.	Revised - Agree in principle. Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax
12487	Liwen Chu	240.26	the bullet is not in line with the all Ack context definition in 27.4.2..	Fix the issue mentioned in comment.	Revised - Agree in principle. Updated the text

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					TGax editor shall incorporate changes in 11-18-0027-04-00ax
12488	Liwen Chu	240.34	QoS Null in multi-TID A-MPDU can't request Ack.	Fix the issue mentioned in comment.	Revised - Agree in principle. Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax
12489	Liwen Chu	241.28	"Group Addressed Multi-STA BlockAck In DL MU Support in DL MU Support subfield" What are you talking about? Change it to the correct subfield name.	Fix the issue mentioned in comment.	Revised - Agree in principle. Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax
12630	Mark RISON	239.41	" an Action frame or an MMPDU that solicits a response." -- these overlap	Change the cited text to "a Management frame other than an Action No Ack frame"	Revised - Agree in principle. No need to explicitly mention Action/Action No Ack, since it is a type of management frame. Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax
12631	Mark RISON	240.07	" an Action frame or an MMPDU that solicits an immediate acknowledgement" -- these overlap	Change the cited text to "a Management frame other than an Action No Ack frame"	Revised - Agree in principle. No need to explicitly mention Action/Action No Ack, since it is a type of management frame. Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax
12826	Mark RISON	239.13	The A-MPDU might contain Action frames rather than QoS Data/Null frames	Add "Action," before QoS Data at 239.13	Revised - Agree in principle. No need to explicitly mention Action/Action No Ack, since it is a type of management frame. Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax

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12827	Mark RISON	240.22	It doesn't have to be an UMRS, it can be a Trigger frame	Change " if a UMRS Control field is present" to "either a Trigger frame or a frame with a UMRS Control field is present" (as under 3))	Rejected - Since this paragraph is about S-MPDU, it cannot carry both the trigger-frame MPDU and QoS-Data. Only UMRS is allowed in this case
12828	Mark RISON	240.32	"carries a multi-TID A-MPDU" is known by the transmitter but not by the receiver	Reword in terms of "receives QoS Data or QoS Null frames with ack policy HTP Ack and with more than one TID, or receives a QoS Data or QoS Null frame with ack policy HTP Ack and an Action frame". Ditto in Subclauses 27.4.4.2, 27.4.4.3, 27.4.4.5	Revised - Agree in principle. No need to explicitly mention Action/Action No Ack, since it is a type of management frame. Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax
12829	Mark RISON	240.39	It is not clear whether an HE TB PPDU is the transmission by a given STA or the union of the transmissions by a set of STAs (as specified in the Trigger frame/UMRS). Wording like "If the HE TB PPDU carries S-MPDUs, A-MPDUs, or multi-TID A-MPDUs from more than one STA" implies the latter but wording like "A non-AP STA that sends an HE TB PPDU as a response to a Basic Trigger frame" implies the former	State in 28.3.4 that an HE TB PPDU is the waveform generated by a given STA, and that an UL MU PPDU consists of one or more HE TB PPDUs. Change the last para of 27.4.4.5 to "If there is an HE TB PPDU from more than one STA, the AP shall respond with a Multi-STA BlockAck frame carried [...]"	Revised - The current text already captures the idea that the HE-TB PPDU is a union of transmissions from multiple STAs.
12831	Mark RISON	241.26	Issues with "Group Addressed Multi-STA BlockAck In DL MU Support": should be hyphen not space at 136.19, 187.15, 241.27; should be specified to be reserved when transmitted by an AP; "if the receivers of group-addressed Multi-STA BlockAck frame support the reception of MU Multi-STA BlockAck frame by Group Addressed Multi-STA BlockAck In DL MU Support in DL MU Support subfield in the HE MAC Capabilities Information field The Ack Type field shall be set according to the acknowledgement context" is complete gobbledegook and should be "if the receiving STAs have all set the Group Addressed Multi-STA BlockAck In DL MU Support subfield the HE MAC Capabilities Information field to 1"; "An HE AP should only transmit" at 241.30 is confusing and should be "An HE AP shall not transmit a group addressed Multi-STA BlockAck frame in an HE MU PPDU to a non-AP HE STA on any RU other than the broadcast RU (26/52/106/242/484/996) (see 28.3.10.8.6 (HE-SIG-B per-user content)) that includes the RU used for receiving the immediately preceding HE TB PPDU from that STA"	As it says in the comment	Revised - Agree in principle. Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax

12832	Mark RISON	239.16	The usage of the term "S-MPDU" is incorrect. An S-MPDU, from the baseline, is "An MPDU that is the ***only*** MPDU in an aggregate MPDU (A-MPDU) carried in a VHT physical layer (PHY) protocol data unit (PPDU) and that is carried in an A-MPDU subframe with the EOF subfield of the MPDU delimiter field equal to 1." So an MPDU with EOF=1 in an A-MPDU that also contains a QoS Null MPDU with EOF=0 and No Ack ack policy, or an Action No Ack frame, say, is not an S-MPDU. This breaks e.g. 27.4.4.2 because a QoS Data with EOF=1 not sent under a BA agreement needs to be responded to with an Ack even if it's in an A-MPDU with an Action No Ack or QoS Null No Ack	Review all uses of the term "S-MPDU" and change those that need to be (e.g. the one at the referenced location) to "MPDU in a delimiter with EOF=1"	Revised - Agree in principle. Usage of S-MPDU is consistent with the definition. Removed QoS Null (which was also pointed out by other CIDs). Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax
12887	Mark RISON	239.26	"If the HE SU PPDU carries a multi-TID A-MPDU that includes more than one QoS Data frame or QoS Null frame with the Ack Policy field equal to Implicit Block Ack Request and with more than one TID, then the STA shall respond with a Multi-STA BlockAck" -- also if it contains just one QoS Data and also contains an Action	Include the case 1xQoS+1xAction in addition to the case >1xQoS already described	Revised - Agree in principle. Revised the text to add MMPDU + QoS Data TGax editor shall incorporate changes in 11-18-0027-04-00ax
12888	Mark RISON	239.20	A QoS Null cannot be sent under a BA and so cannot have ack policy Implicit BAR. Ditto in 27.4.4.3	Change "includes one or more QoS Data frame or QoS Null frame with EOF = 0, and with the Ack Policy field equal to Implicit Block Ack Request for at least one MPDU" to "includes one or more QoS Data frames with EOF = 0, and with the Ack Policy field equal to Implicit Block Ack Request". In 3) below change "includes more than one QoS Data frame or QoS Null frame with the Ack Policy field equal to Implicit Block Ack Request and with more than one TID" to "includes more than one QoS Data frame with the Ack Policy field equal to Implicit Block Ack Request"	Revised - Agree in principle. Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax
12889	Mark RISON	239.17	What if it's a Management frame other than an Action or Action No Ack? Those need to be acked too	Change "an Action Ack frame" to "a Management frame other than an Action No Ack frame"	Revised - Agree in principle. Updated the text to 'MMPDU that solicits an immediate acknowledgement' to make it general, since Action frame is a type of MMPDU TGax editor shall incorporate changes in 11-18-0027-04-00ax

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12891	Mark RISON	239.06	The TID is also important (distinguishes single-TID from multi-TID A-MPDUs)	Add "TID and" before "Ack Policy" at the referenced location	Revised - Agree in principle. Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax
12892	Mark RISON	239.06	The PPDU type is also important	Add "PPDU format" to the list of deciding factors	Rejected - Though it is true that there are some special rules based on PPDU format (like HE TB PPDU), the Ack rules are self-contained within the frame
12893	Mark RISON	239.36	This subclause is about responding, so rules on what the AP may or may not do are not appropriate	Move the first para (inc. bullets) to a different subclause	Rejected - The rules for response is in the first paragraph. Removing this paragraph will bring incompleteness
12894	Mark RISON	240.03	This subclause is about responding, so rules on what the AP may or may not do are not appropriate	Move the first sentence to a different subclause	Rejected - The rules for response is part of the sentence. Removing this sentence will bring incompleteness
12895	Mark RISON	240.41	This subclause is about responding, so rules on what the non-AP STA may or may not do are not appropriate	Move the first sentence to a different subclause	Rejected - The rules for response is part of the sentence. Removing this sentence will bring incompleteness
12896	Mark RISON	240.04	"shall set the Ack Policy to HTP Ack for each of the MPDUs for which it intends to solicit an immediate response" -- not all MPDUs have an Ack Policy field	Change "MPDUs" to "QoS Data or QoS Null frames"	Revised - Agree in principle. Changed MPDU to QoS Data frames. QoS Nulls are not allowed. Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax
12897	Mark RISON	240.10	What if it's a Management frame other than an Action or Action No Ack? Those need to be acked too	Change "an Action-Ack frame" to "a Management frame other than an Action No Ack frame" at the referenced location and at line 17. Also put a para break before the sentence at the referenced location	Revised - Agree in principle. No need to explicitly mention Action/Action No Ack, since it is a type of management frame. Updated the text TGax editor shall incorporate

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					changes in 11-18-0027-04-00ax
12898	Mark RISON	240.33	"If the HE MU PPDU or HE SU PPDU carries a multi-TID A-MPDU that includes QoS Data frames or QoS Null frames with the Ack Policy field equal to HTP Ack, and an Action Ack frame" -- also if it contains just QoS Data but with >1 TID. Also not clear the case 1QoS+1xAction is being covered (because of use of plural "frames")	Include the cases 1xQoS+1xAction and 2xQoS-different-TIDs in addition to the case >1xQoS+1xAction already described	Revised - Agree in principle. Updated the text TGax editor shall incorporate changes in 11-18-0027-04-00ax
12899	Mark RISON	240.42	" shall set the Ack Policy to Normal Ack/Implicit Block Ack Request " -- can only do so for QoS Data/Null (not e.g. MMPDUs)	add "of QoS Data and QoS Null frames" after "Ack Policy"	Revised - Agree in principle. Updated the text. QoS Nulls are not allowed TGax editor shall incorporate changes in 11-18-0027-04-00ax
12900	Mark RISON	240.44	"If the HE AP intends to send the response in a DL SU PPDU format" -- the AP doesn't need to "intend", it just needs to do"	Change the cited text to "If the HE AP sends the response in a DL SU PPDU format"	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12902	Mark RISON	240.52	"an S-MPDU from a single STA that solicits an immediate response" where the S-MPDU is a QoS Data/Null is also "a single TID A-MPDU from a single STA that solicits an immediate response", so 1) and 2) overlap and hence contradict each other	Mention QoS Data/Null and EOF=0, as in 27.4.4.3(4.2)	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12904	Mark RISON	240.53	If the multi-TID A-MPDU has an Action frame too, the M-BA will have to have a mix of Ack Types. Also "all-ack" has been overlooked	Change " Multi-STA BlockAck frame with the Ack Type field set to 0 carried in a DL SU PPDU format" to "a Multi-STA BlockAck with one Per TID AID Info subfield, the Ack Type field set to 1 and the TID field set to 14, or a Multi-STA BlockAck frame with the Ack Type field set to 0 in at least two Per TID AID Info subfields and optionally the Ack Type field set to 1 and the TID field set to 15 in another Per TID AID Info subfield, carried in a DL SU PPDU format"	Revised - Agree in principle. Text is made more general by referring to the corresponding section, since there are different cases. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12905	Mark RISON	240.62	"If the HE TB PPDU carries S-MPDUs, A-MPDUs, or multi-TID A-MPDUs from more than one STA, or a combination of S-MPDUs from a subset of STAs, A-MPDUs from another subset of STAs, or multi-TID A-MPDUs from another subset of STAs then the AP shall respond with a Multi-STA BlockAck frame" -- it might choose to respond with a DL MU PPDU containing Ack/C-BA instead	Make this para a "4)" so it is covered by the "If the HE AP intends to send the response in a DL SU PPDU format," above	Rejected - This part covers the reception of HE-TB PPDU as a union of multiple STAs. So, the response has to be in M-BA

12906	Mark RISON	240.62	"If the HE TB PPDU carries S-MPDUs, A-MPDUs, or multi-TID A-MPDUs from more than one STA, or a combination of S-MPDUs from a subset of STAs, A-MPDUs from another subset of STAs, or multi-TID A-MPDUs from another subset of STAs" - this is gibberish	Change the cited text to "If the HE AP needs to acknowledge frames from more than one STA"	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12907	Mark RISON	241.07	This subclause is about responding, so rules on what the non-AP STA may or may not do are not appropriate	Move the first sentence to a different subclause	Rejected - The rules for response is part of the sentence Removing this sentence will bring incompleteness
12908	Mark RISON	241.42	" shall set the Ack Policy to Normal Ack/Implicit Block Ack Request " -- can only do so for QoS Data/Null (not e.g. MMPDUs)	add "of QoS Data and QoS Null frames" after "Ack Policy" and delete " for each of the MPDUs carried in the A-MPDU"	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12911	Mark RISON	241.14	"If the HE TB PPDU carries an S-MPDU from more than one STA, or (multi-TID) A-MPDU from more than one STA, or a combination of an S-MPDU from some STAs and (multi-TID) A-MPDU from other STAs" -- this is gibberish	Change the cited text to "If the HE AP needs to acknowledge frames from more than one STA"	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13517	Simone Merlin	240.16	Remove QoS Null from the following sentence, since this statement is inconsistent with other sections of the spec: "A non-AP STA that receives an HE MU PPDU or HE SU PPDU with an A-MPDU that contains QoS Data or QoS Null frames"	As in the comment	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13518	Simone Merlin	240.21	Remove QoS Null from the following sentence, since this statement is inconsistent with other sections of the spec: "If the HE MU PPDU or HE SU PPDU carries an S-MPDU that is a QoS Data frame or QoS Null.."	As in the comment	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13519	Simone Merlin	240.26	Remove QoS Null from the following sentence, since this statement is inconsistent with other sections of the spec: "If the HE MU PPDU or HE SU PPDU carries a single TID A-MPDU that includes one or more QoS Data frames or QoS Null frames..."	As in the comment	Rejected - S-MPDU allows QoS Null with Ack required.
13520	Simone Merlin	240.33	Remove QoS Null from the following sentence, since this statement is inconsistent with other sections of the spec: "If the HE MU PPDU or HE SU PPDU carries a multi-TID A-MPDU that includes QoS Data frames or QoS Null frames..."	As in the comment	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax

13734	Woojin Ahn	239.01	The terms 'S-MPDU', 'single TID A-MPDU' and 'multi-TID A-MPDU' define the ways of constructing an A-MPDU for HE STA as an originator. At the receiver side, however, the recipient may not verify whether the received A-MPDU is an S-MPDU, a single TID A-MPDU or a multi-TID A-MPDU as intended by the originator in case the received A-MPDU contains an error. Furthermore, the recipient doesn't need to know the type of A-MPDU in order to decide the response frame format, but the number of TIDs requiring immediate response and the presence of an Action frame and MPDU with EOF:1	Delete 'S-MPDU', 'single TID A-MPDU', 'multi-TID A-MPDU' from this subclause and the subsequent subclauses, and rewrite the rules based on the number of TIDs requiring immediate responses and EOF:1 MPDU among successfully received MPDUs by the recipient	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13735	Woojin Ahn	239.16	"A single TID A-MPDU may include the following: One frame with a single TID value with the Ack Policy field equal to Normal Ack or one Action frame, at least one of QoS Null frame with the Ack Policy set to No Ack.	If the HE SU PPDU carries an S-MPDU or an A-MPDU that includes only one MPDU with EOF = 1 soliciting an immediate response, then the STA shall respond with an Ack frame	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13736	Woojin Ahn	239.20	In an multi-TID A-MPDU, MPDUs from different TIDs don't have to have the same value of the Ack Policy subfield. Therefore, a non ack-enabled multi-TID A-MPDU may contains QoS Data frames from one TID with the Ack Policy subfield set to implicit BAR and another TID with the Ack Policy subfield set to Block Ack. In this case, the recipient should respond with a compressed BA frame, because the MPDUs from only one TID require immediate responses.	"If the HE SU PPDU carries an A-MPDU that includes one or more MPDU, and if one or more MPDU from only one TID solicits an immediate response and the EOF of the MPDU is set to 1, then the STA shall respond with an Compressed BlockAck frame.	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13737	Woojin Ahn	239.16	An Ack-enabled multi-TID A-MPDU may contains QoS Data frames from a TID with the Ack Policy subfield set to Block Ack and one QoS Data with the EOF field set to 1 or an Action frame. In this case, the recipient must respond with an Ack frame	If the HE SU PPDU carries an S-MPDU or an A-MPDU that includes only one MPDU with EOF = 1 soliciting an immediate response, then the STA shall respond with an Ack frame.	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13738	Woojin Ahn	239.49	"A single TID A-MPDU may include the following: One frame with a single TID value with the Ack Policy field equal to Normal Ack or one Action frame, at least one of QoS Null frame with Ack Policy set to No Ack.	If the HE MU PPDU carries an S-MPDU or an A-MPDU that includes only one MPDU with EOF = 1 soliciting an immediate response, then the STA shall respond with an Ack frame	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13739	Woojin Ahn	239.53	In an multi-TID A-MPDU, MPDUs from different TIDs don't have to have the same Ack Policy value. Therefore, a non ack-enabled multi-TID A-MPDU may contains QoS Data frames from one TID with the Ack Policy subfield set to implicit BAR and another TID with the Ack Policy subfield set to Block Ack. In this case, the recipient should respond with a compressed BA frame, because the MPDUs from only one TID require immediate responses.	"If the HE MU PPDU carries an A-MPDU that includes one or more MPDU, and if one or more MPDU from only one TID solicits an immediate response and the EOF of the MPDU is set to 1, then the STA shall respond with an Compressed BlockAck frame.	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax

13740	Woojin Ahn	239.49	An Ack-enabled multi-TID A-MPDU may contains QoS Data frames from a TID with the Ack Policy subfield set to Block Ack and one QoS Data with the EOF field set to 1 or an Action frame. In this case, the recipient must respond with an Ack frame	If the HE MU PPDU carries an S-MPDU or an A-MPDU that includes only one MPDU with EOF = 1 soliciting an immediate response, then the STA shall respond with an Ack frame	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13741	Woojin Ahn	240.21	If a recipient received an EOF:1 MPDU and a Trigger frame, it is better to respond with an Ack frame	If the HE MU PPDU or HE SU PPDU carries an S-MPDU or an A-MPDU that includes only one MPDU with EOF = 1 soliciting an immediate response, and if a UMRS Control field or a Trigger frame is present, then the STA shall respond with an Ack frame carried in the HE TB PPDU sent as a response.	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13742	Woojin Ahn	240.21	"A single TID A-MPDU may include the following: One frame with a single TID value with the Ack Policy field equal to Normal Ack or one Action frame and at least one of QoS Null frame with Ack Policy set to No Ack.	"If the HE MU PPDU or HE SU PPDU carries an A-MPDU that includes one or more MPDU, and if one or more MPDU from only one TID solicits an immediate response and the EOF of the MPDU is set to 1, and if a UMRS Control field or a Trigger frame is present, then the STA shall respond with an Compressed BlockAck frame. If the HE MU PPDU or HE SU PPDU carries an A-MPDU that includes one or more MPDU, and if one or more MPDU from more than one TID solicits an immediate response, and if a UMRS Control field or a Trigger frame is present, then the STA shall respond with an Multi-STA BlockAck carried in the HE TB PPDU sent as a response."	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13743	Woojin Ahn	240.26	In an multi-TID A-MPDU, MPDUs from different TIDs don't have to have the same Ack Policy value. Therefore, a non ack-enabled multi-TID A-MPDU may contains QoS Data frames from one TID with the Ack Policy subfield set to implicit BAR and another TID with the Ack Policy subfield set to No Ack. In this case, the recipient should respond with a compressed BA frame, because the MPDUs from only one TID require immediate responses.	If the HE MU PPDU or HE SU PPDU carries an S-MPDU or an A-MPDU that includes only one MPDU with EOF = 1 soliciting an immediate response, and if a UMRS Control field or a Trigger frame is present, then the STA shall respond with an Ack frame carried in the HE TB PPDU sent as a response.	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
11086	Adrian Stephens	234.49	"Support for a Multi-STABlockAckReq (MU-BAR)" -- The other two list items are frames. Is this?	Add "frame" after cited text.	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax

11089	Adrian Stephens	236.33	"If all MPDUs in the AMPDU are received successfully, then the recipient may follow the procedure described in the All Ack context. Otherwise, the recipient may follow the procedure described in the BlockAck context." I think you intend it to do one of these. As stated it can choose to do nothing.	Replace second sentence with "Otherwise, the recipient shall follow ..." Also, I'm not convinced that the "may generate a Multi-STA BlockAck frame" is correct. Again, it appears to give the STA the option of generating no response.	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
11091	Adrian Stephens	238.58	"NOTE--An HE STA can generate a BlockAck frame with variable length Block Ack Bitmap field in which case the STA ensures that the BlockAck frame response fits within the remaining duration of the TXOP." Where is the normative text that describes this? Is it correct? It is the job of the TXOP holder to ensure the TXOP is respected. Is the transmitter of the BlockAck frame always the TXOP holder? If not, how does the TXOP holder know the TXOP duration remaining? Even if it can know, this is a change from the usual behavior that the responder doesn't need to know or respect the TXOP duration remaining.	If this behavior is intended, add reference to normative text that describes this behavior. Alternatively remove NOTE.	Revised - The TXOP holder is expected to adjust the PPDU size budgeting for corresponding Block Ack duration. The note here is informative
11754	GEORGE CHERIAN	236.18	Circular sentence. Rephrase: "An HE STA that transmits a BlockAckReq frame carried in an HE TB PPDU contains the TID Values of the Per TID Info subfields of the BAR Information field of the BlockAckReq frame for the MPDUs of which TIDs correspond to any AC"	As in the comment	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
11755	GEORGE CHERIAN	236.29	This is meant for S-MPDU received in HE TB PPDU. Change the sentence from: "An HE AP that receives an S-MPDU" To: "An HE AP that receives an S-MPDU in an HE TB PPDU"	As in the comment	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
11756	GEORGE CHERIAN	236.29	Need to add the general case of post-associated STAs as well to the following case of S-MPDU: "An HE AP that receives an S-MPDU prior to association may generate a Multi-STA BlockAck frame using the procedure described in pre-association ack context."	As in the comment	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
11807	Graham Smith	234.53	"Additionally, the HE-immediate block acknowledgment procedure also added features such as" Additionally added? How many times was it added? And is it in the past tense, or is it specifying it here? Also needs a reference to HE immediate block acknowledgment? Also what "such as" mean, are these added or something like them?	Replace cited text with "HE-immediate block acknowledgment procedure adds the following features:"	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12015	James Yee	236.18	This paragraph contains similar and somehow duplicated information as the previous paragraph.	Revise the paragraph and the previous one. Make the procedures more compact.	Rejected - Previous paragraph is about Multi-TID BAR, which has some non-overlapping

Deleted: Rejected

					requirements than BAR
12285	Kazuyuki Sakoda	234.40	HE block acknowledgement, MU-BAR, should be useful for STAs in IBSS or in MBSS. However, the current spec only assumes that the procedure is only used by APs and STAs associated to an AP. The spec should allow more flexible utilization of HE block acknowledgement.	Please consider to allow use of HE block acknowledgement procedure for STAs in IBSS and in MBSS.	Rejected - MU operation is not defined for IBSS or MBSS.
12478	Liwen Chu	235.17	Change the sentence to "An HE AP that sends a Multi-STA BlockAck frame where the Per AID TID Info fields are all addressed to a single recipient STA solicited by HE TB PDU may set the RA field to either the address of the recipient STA or the broadcast address. An HE AP that sends a Multi-STA BlockAck frame where the Per AID TID Info fields are all addressed to a single recipient STA solicited by HE SU PDU, HE ER SU PDU or HE MU PDU shall set the RA field to either the address of the recipient STA."	As in comment	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12479	Liwen Chu	236.09	This paragraph is not in line with the multi-TID A-MPDU rules.	Fix the issue.	Rejected - Commentor doesn't identify the discrepancy. The text seems to be inline with the multi-TID AMPDU rules
12481	Liwen Chu	237.07	One MPDU with EoF of MPDU delimiter equal to 1 doesn't need multiple Per AID TID Info fields with Ack Type equal to 1.	Fix the issue mentioned in comment.	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12482	Liwen Chu	237.16	Management frame can also be sent by devices other than unassociated STA, e.g. DisAssociation by AP.	Fix the issue mentioned in comment.	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12483	Liwen Chu	237.23	the multiple Per AID TID Info fields for same AID shall be put together without Per AID TID Info with other AID value in between	Add the restriction mentioned in the comment.	Rejected - The restriction looks artificial
12484	Liwen Chu	238.27	This needs to be a shall statement. with this change the note in L58 is not needed	Fix the issue mentioned in comment.	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12485	Liwen Chu	238.46	BlockAckBitmap is undefined. "where the BitmapLength is the largest value for the BlockAckBitmap that is supported by the recipient" is problematic since one value can't be the largest value	Fix the issue mentioned in comment.	Revised - Typo, BlockAckBitmap to BlockAck Bitmap, which is defined TGax editor shall incorporate changes in 11-18-0027-04-00ax

12491	Liwen Chu	241.51	This is not in line with all Ack context.	Fix the issue mentioned in comment.	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12636	Mark RISON	236.33	A Multi-TID BlockAck should be used in response to a multi-TID A-MPDU rather than a Multi-STA BlockAck, if there is only one STA to respond to (e.g. when the transmitter of the A-MPDU is an AP)	Change "If all MPDUs in the A-MPDU are received successfully, then the recipient may follow the procedure described in the All Ack context. Otherwise, the recipient may follow the procedure described in the BlockAck context." to "If all MPDUs in the A-MPDU are received successfully, then the recipient may follow the procedure described in the All Ack context. Otherwise, the recipient shall generate a Multi-TID BlockAck frame."	Rejected - This point was discussed during the time when the group eventually decided to use M-BA. The reason was simplicity
12721	Mark RISON		Responder should not use M-BA if it could use C-BA or Ack	Specify that if a STA can ack using just an Ack frame, it shall do so, otherwise if it can ack using just a C-BA frame it shall do so, otherwise it uses an M-BA	Rejected - This is already the case. Commenter may come back with specific sections that doesn't allow this.
12739	Mark RISON	236.63	"the Ack-Enabled A-MPDU Support subfield" -- there is no such subfield	Refer to a subfield that exists (I think it's the Ack-Enabled Aggregation Support subfield)	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12745	Mark RISON	236.58	"A recipient receiving a single MMPDU from the unassociated STA," -- it can't receive more than one at a time anyway, and there is no antecedent for "the unassociated STA"	Change "a single" to "an" and "the" to "an" in the cited text	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12750	Mark RISON	241.51	"An HE STA that receives a single-TID A-MPDU in an HE SU PPDU that solicits an immediate response shall send the acknowledgement using a Compressed BlockAck frame" -- not if the A-MPDU only contains one MPDU and that MPDU is with EOF=0	Append "except if the A-MPDU only contains one MPDU that solicits an immediate response, and that MPDU is in an A-MPDU subframe with EOF = 1, in which case it shall send the acknowledgement using an Ack frame"	Revised - Since the ack rules are already captured in 27.4.4, deleting the two sentences TGax editor shall incorporate changes in 11-18-0027-04-00ax
12820	Mark RISON	236.25	"an S-MPDU, or A-MPDU, or a multi-TID A-MPDU" -- an S-MPDU is in an A-MPDU and a multi-TID A-MPDU is an A-MPDU	Change the first para of the referenced subclause to "A STA that transmits a Multi-STA BlockAck frame in response to an A-MPDU sets the Ack Type and TID subfields in the AID TID Info fields depending on the acknowledgement context as follows:"	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax

12821	Mark RISON	236.29	"may generate a Multi-STA BlockAck frame using the procedure described in pre-association ack context." is not clear: what does it do if it chooses not to, and where is the description of "pre-association ack context"?	Add a xref to this description, add "the" before "pre" and state what the STA does if it does not use the procedure	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12822	Mark RISON	236.31	Multi-TID A-MPDUs are defined, but single-TID A-MPDUs are not (presumably everything that is not a MTAM is a STAM -- even if it doesn't have any QoS Data frames)	State where multi-TID A-MPDUs are defined that an A-MPDU that is not a multi-TID A-MPDU is a single-TID A-MPDU	Revised - Agree in principle. Updated the text. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12823	Mark RISON	236.33	"If all MPDUs in the AMPDU are received successfully, then the recipient may follow the procedure described in the All Ack context. Otherwise, the recipient may follow the procedure described in the BlockAck context." is not clear: what if it chooses to do neither?	State what the STA does if it does not do either of these	Revised - Agree in principle. Otherwise clause is changed from 'may' to 'shall'. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12847	Mark RISON	234.39	The rules for acknowledgment should be simplified. Irrespective of PPDU format, role, direction, etc., for a given RU+set of spatial streams: - if there is only one STA and only one MPDU to ack, and it had EOF=1, then send an Ack frame - otherwise, if there is only one STA and only one TID to ack, then send a C-BA - otherwise, send an M-BA	As it says in the comment	Revised - The section has been re-written to simplify the rules. Commentor to see if the changes satisfy the comment, since the comment is not very specific TGax editor shall incorporate changes in 11-18-0027-04-00ax
12866	Mark RISON	241.50	"a Multi-TID A-MPDU that solicits an immediate response" is known by the transmitter but not by the receiver	Reword in terms of "receives QoS Data or QoS Null frames with ack policy other than No Ack or Block Ack and with more than one TID, or receives a QoS Data or QoS Null frame with ack policy other than No Ack or Block Ack and an Action frame"	Revised.- Since the ack rules are already captured in 27.4.4, deleting the two sentences TGax editor shall incorporate changes in 11-18-0027-04-00ax
12867	Mark RISON	241.50	"An HE STA that receives a Multi-TID A-MPDU that solicits an immediate response shall send the acknowledgement using a Multi-STA BlockAck frame. An HE STA that receives a single-TID A-MPDU in an HE SU PPDU that solicits an immediate response shall send the acknowledgement using a Compressed BlockAck frame." is covered in 27.4.4	Delete the cited text	Revised.- Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12907	Mark RISON	241.07	This subclause is about responding, so rules on what the non-AP STA may or may not do are not appropriate	Move the first sentence to a different subclause	Rejected - The intention is to keep all the related text together, based on earlier group discussion
12908	Mark RISON	241.42	"shall set the Ack Policy to Normal Ack/Implicit Block Ack Request" -- can only do so for QoS Data/Null (not e.g. MMPDUs)	add "of QoS Data and QoS Null frames" after "Ack Policy" and delete " for each of the MPDUs	Rejected - The reference doesn't point to the

				carried in the A-MPDU"	right context/comment
12909	Mark RISON	241.11	"If the HE AP intends to send the response in an OFDMA HE MU PPDU format" -- the AP doesn't need to "intend", it just needs to do"	Change the cited text to "If the HE AP sends the response in an OFDMA HE MU PPDU format"	Revised.- Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12910	Mark RISON	241.11	"If the HE AP intends to send the response in an OFDMA HE MU PPDU format" -- could use DL MU-MIMO instead	Delete "OFDMA" in the cited text	Revised.- Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12911	Mark RISON	241.14	"If the HE TB PPDU carries an S-MPDU from more than one STA, or (multi-TID) A-MPDU from more than one STA, or a combination of an S-MPDU from some STAs and (multi-TID) A-MPDU from other STAs" -- this is gibberish	Change the cited text to "If the HE AP needs to acknowledge frames from more than one STA"	Revised.- Text is made more general. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12912	Mark RISON	241.12	"If the HE TB PPDU carries an S-MPDU from more than one STA, or (multi-TID) A-MPDU from more than one STA, or a combination of an S-MPDU from some STAs and (multi-TID) A-MPDU from other STAs" -- and what if these conditions are not met? What does an HE AP that wants to transmit a DL MU PPDU do then?	Delete " the following acknowledgment procedure: a) If the HE TB PPDU carries an S-MPDU from more than one STA, or (multi-TID) A-MPDU from more than one STA, or a combination of an S-MPDU from some STAs and (multi-TID) A-MPDU from other STAs, then the HE AP shall"	Revised.- Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12913	Mark RISON	241.20	" an A-MPDU that solicited an immediate response " is not defined, and the natural interpretation would include an A-MPDU containing an S-MPDU	Change to "only QoS Data frames with EOF=0, the same TID, and the Ack Policy equal to Implicit Block Ack Request"	Revised.- Text is made more general. TGax editor shall incorporate changes in 11-18-0027-04-00ax
12914	Mark RISON	241.22	" a multi-TID A-MPDU that solicited an immediate response was received" is not defined, and anyway this is known by the transmitter but not by the receiver	Change to talk about QoS Data frames with Ack Policy equal to Implicit Block Ack Request from more than one TID, or QoS Data frames with Ack Policy equal to Implicit Block Ack Request and an Action frame	Revised.- Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13022	Matthew Fischer	234.55	Why are there two separate lists?	Merge the two separate lists into one list	Revised.- Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13023	Matthew Fischer	234.47	There is no statement of the mandatory vs optional nature of the support for MBA and MTIDBAR	Clarify the mandatory and optional status of the multi STA and multi TID BA and BAR frames	Rejected - This section is intended to give the overview. The mandatory/optional status is discussed where each of the feature is defined

13036	Matthew Fischer	234.44	Block Ack flow control is needed	Add a mechanism for Block Ack flow control, to allow the data frame recipient to indicate receive buffer availability, possibly simply adopt the DMG RBUFCAP signaling in the BA frame for HE STA	Rejected - Benefits are not compelling compared to the changes needed, considering the state of the draft.
13150	Qi Xue	241.50	Remove the following sentence, since it is out of context: "An HE STA that receives a Multi-TID A-MPDU that solicits an immediate response shall send the acknowledgement using a Multi-STA BlockAck frame."	As in the comment	Revised.- Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13189	Rajesh Kumar	236.01	There is a paragraph towards the end of section 27.5.3.3 (P251L1) that already describes some rules for setting the RA when responding to a Trigger frame. Move this paragraph to section 27.5.3.3 so that all the RA rules are in one place.	As in comment	Rejected - The cited section 27.5.3.3 is UL MU behavior. RA for acknowledgment is more general than UL MU
13252	Robert Stacey	234.44	It also adds support for many different bitmap lengths	Mention support for different bitmap lengths	Revised.- Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13254	Robert Stacey	234.55	It is not the STA that is acknowledged, it is the data from that STA	Change to "Acknowledging data from multiple STAs using..."	Revised.- Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13255	Robert Stacey	234.57	What is "All-Ack"? Also, its not a variant of the Multi-STA BlockAck frame, it's a particular Per AID TID Info field setting.	Change to "All ack context in the Per AID TID Info field of a Multi-STA BlockAck frame to acknowledge all QoS Data frames and Management frames from a particular STA."	Revised.- Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13256	Robert Stacey	234.62	"Acknowledgement for single MPDUs" is misleading. QoS Data frames in EOF=1 subframes are acknowledged with Ack Type = 1, TID = 0-7 while Action frames and PS-Poll frames are acknowledged with Ack-Type = 1, TID = 15". In the multi-TID case there can be more than one (not single MPDUs).	Fix	Revised.- Agree in principle. Deleted the cited sentence. Instead, the terminology used in the rest of the document is modified to reflect the CID. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13257	Robert Stacey	235.01	It is sufficient to require that a STA respond with a certain frame type when it receives a frame that solicits that frame type. There is no need for a separate "shall" statement on the "generation" of that frame type.	Remove these two statements. They are already covered by shall statements elsewhere, e.g., P239L23.	Revised.- Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax

13258	Robert Stacey	235.11	Why do we need a statement "A non-AP HE STA that is not associated with an AP shall not send a Multi-STA BlockAck frame"? Why would we have this statement and not one like "A STA shall not send a BlockAck frame unless it has established a block ack agreement"? This type of shall not will never be comprehensive and is best avoided. What harm is caused by a STA sending arbitrary frames that have no consequence?	Remove statement.	Revised.- Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13260	Robert Stacey	235.30	Establishing (or not establishing) a block ack agreement is not relevant to how the STA parses the Multi-STA BlockAck frame. A STA that has established a block ack agreement may still receive acknowledgement for individual data frames or management frames. This applies to the statement at L37 as well.	Replace this and the next paragraph with a forward reference: "An HE STA that receives a Multi-STA BlockAck frame as a response to frames requiring acknowledgement, follows the procedure defined in 27.4.2 for interpreting the response."	Revised.- Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13262	Robert Stacey	236.09	Multi-TID block ack operation deserves a separate subclause.	Create a new subclause "Multi-TID block ack procedure" and move this and other multi-TID statements there.	Rejected - Removed the terminology of Multi-TID from the rx standpoint. Updated text is general, which also includes ack procedure for multi-TID. So, no need to create a section for Multi-TID. Also, processing of BAR/MultiTID-BAR is in a separate section: 27.4.5
13263	Robert Stacey	236.25	The recipient of an "S-MPDU" does not always ack it. An S-MPDU could be any MPDU, not necessarily one requiring acknowledgement. The recipient of an A-MPDU does not ack it; it acks one or more frames carried in the A-MPDU. Similarly, a multi-TID A-MPDU is not acked. In fact a multi-TID A-MPDU is defined by what is transmitted and not what is received. There is no need to group all these statements into a bulleted sequence. Simply list each condition and response in a separate paragraph.	Delete intro paragraph and convert each bullet into a stand alone statement.	Revised.- Agree in principle. Section is rewritten to reflect this comment and other comments along the same lines. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13264	Robert Stacey	236.29	Receives an S-MPDU prior to association - what does that mean? Receives a frame with TA from a STA that has not yet completed association? How would define completing association?	The criteria must be a frame that requires acknowledgement that is received in an HE TB PPDU on an RU allocated to "AID" 2045. Also, we need a statement that if one or more frames are received on RUs allocated to AID 2045, the response must be a Multi-STA BlockAck frame. It can't be an Ack frame for example. I'd suggest we create a new subclause	Revised.- Agree in principle. Section is rewritten to reflect the concern. However, didn't create a new section for UORA Ack, since the procedure is very similar to responding to an HE TB PPDU, except for the AID/TID and BA information field value

				"Acknowledgement procedure for UORA" that specifically deals with these cases.	TGax editor shall incorporate changes in 11-18-0027-04-00ax
13265	Robert Stacey	236.32	Single TID A-MPDU is not defined. Also, the AP must be "all-ack" capable. And the criteria is more involved that presented by this statement: there can't be any MPDU delimiter errors and there can't be any MPDU FCS errors.	Fix	Revised.- Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13266	Robert Stacey	236.37	The term "multi-TID A-MPDU" is defined from the context of the initiator and has no meaning in the context of the recipient. "For each TID" is also not accurate. Multi-STA BlockAck frame is used for combinations of frames that don't necessarily involve more than one TID, e.g., Action frame + QoS Data frame with ack policy Normal Ack.	Multi-TID handling is complex and deserves a separate subclause. Create a "Multi-TID acknowledgement procedure" subclause and move this and other statements related to multi-TID acknowledgement there. If we treat multi-TID separately, then "single TID" Multi-STA BlockAck is purely an AP procedure involving more than one STA.	Revised.- Agree in principle with the commentor on the usage of 'multi-TID-AMPDU' wording from receiver standpoint. Section is re-written from a receiver standpoint. However, no new section is created as suggested by the commentor since the procedure can be generalized to include both single TID case and multi TID cases TGax editor shall incorporate changes in 11-18-0027-04-00ax
13269	Robert Stacey	238.10	The shall statment here (and L7, L14, L17, L20) is meaningless. Worse, some actually contradict later statements, e.g., P238L31. What we need are shall not statements.	For example, "A STA shall not transmit a Compressed BlockAck frame with a BlockAck Bitmap field with a length greater than 64 unless the negotiated buffer size is greater than 64.	Revised.- Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13270	Robert Stacey	238.28	"The originator sets the Duration field..." In the ADDBA field? What does this have to do with anything?	Remove sentence	Revised.- Agree that the sentence seems to be in the wrong place. However, this requirement is still valid for the originator of an A-MPDU, BAR. So, moved to a later place in the section with additional description. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13272	Robert Stacey	238.40	An A-MPDU does not solicit anything.	Change to "... a QoS Data frame, Management frame, BlockAckReq frame, ..."	Revised.- Agree in principle.

					TGax editor shall incorporate changes in 11-18-0027-04-00ax
13276	Robert Stacey	238.58	A TXOP responder does not necessarily track "the remaining TXOP duration". In general, we do not expect the a TXOP responder to consider NAV or the Duration field of the soliciting frame when generating a response. It is up to the TXOP holder to ensure that the response fits in the remaining TXOP. A recipient that needs to send a large bitmap should be able to do so; the simplest implementation is one that always generates the max size bitmap (as negotiated) and any optimization beyond that is a nice to have. BTW, how do you generate a variable length bitmap? Are the bits flexible?	Remove NOTE	Revised.- Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13278	Robert Stacey	238.63	Any "remapping" should be defined in the frame formats and not 27.3	Remove statement. Ensure the "remapping" is defined in Clause 9.	Rejected - The sentence is information which is useful for readability purpose
13279	Robert Stacey	241.07	There are numerous problems with this statement and the intent is not clear. 1. "Basic Trigger frame that solicits an immediate response": a Basic Trigger frame always solicits an immediate response. 2. "set the Ack Policy for each MPDU": only QoS Data frames have an Ack Policy that can be set in this way. 3. Whether a QoS Data or QoS Null frame solicits acknowledgement or not is a decision made by the sender; this statement prevents QoS Null being sent with ack policy No Ack for example. which is the only way they can be sent according to statemetns elsewhere.	Remove statement	Revised - This sentence is useful. So, it is updated to incorporate issues raised by the commentor TGax editor shall incorporate changes in 11-18-0027-04-00ax
13515	Simone Merlin	240.06	Incomplete sentence. Fix it. "immediate response (see 10.3.2.10.2 (Acknowledgement procedure for DL MU PPDU in MU format) for an example of this sequence)"	As in the comment	Revised.- Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13516	Simone Merlin	240.08	In the following sentence make it more clear that the responder treats the ack policy as HTP-Ack: "If an Action frame or an MMPDU that solicits an immediate acknowledgement is carried in an HE MU PPDU, then the response is carried in an HE TB PPDU"	As in the comment	Rejected - The rule for responding to a management frame is specified in section 27.4.4.4. No further change needed
13521	Simone Merlin	241.01	Give more clear references than to say "appropriate settings"... "in previous subclauses": "in a DL SU PPDU format that contains the appropriate settings in each Per AID TID Info field intended to each STA as defined in the previous subclauses."	As in the comment	Revised.- Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13663	Tomoko Adachi	239.13	"An HE STA that receives an HE SU PPDU with an A-MPDU that contains QoS Data or QoS Null frames addressed to it shall follow the	Change as follows: "An HE STA that receives an HE SU PPDU with an A-MPDU	Revised.- Agree in principle.

			following acknowledgment procedure." An S-MPDU that is an Action Ack frame is also allowed.	that contains MAC frame(s) addressed to it shall follow the following acknowledgment procedure."	TGax editor shall incorporate changes in 11-18-0027-04-00ax
13664	Tomoko Adachi	239.16	How can a recipient know the received HE SU PPDU is either of 1) to 3) cases? Some MPDUs within an A-MPDU can fail. If there are errors, the recipient cannot be 100% sure between case 2) and case 3). One implementation may be that if there is no errors and it is definitely case 2), then the recipient will respond with C-BA, but otherwise respond with M-BA. Other implementation may be that the recipient decides based on only successful MPDUs. Bad implementation may further determine it's case 1) when a single frame is only successfully received with other multiple frames in error. Considering these, using "shall" statement is meaningless.	Change as follows: 1) If the HE SU PPDU has no errors and is detected to carry an S-MPDU that is ... an Action frame soliciting an Ack frame, ... 2) If the HE SU PPDU has no errors and is detected to carry a single-TID A-MPDU ... 3) Otherwise, the STA shall respond with a Multi-STA BlockAck frame as defined in 27.4.2 (Acknowledgement context in a Multi-STA BlockAck frame), carried in an SU PPDU.	Revised.- Agree in principle with the concern. The section is re-written to address broader comments which also addresses the particular issue pointed out in the comment TGax editor shall incorporate changes in 11-18-0027-04-00ax
13665	Tomoko Adachi	239.42	"The A-MPDUs in the HE MU PPDU shall not contain an Action frame or an MMPDU that solicits a response." There is no problem containing an Action Ack frame in one of the PSDUs that solicits an immediate response within the HE MU PPDU. This restriction is too much. By allowing this, the recipient that is solicited an immediate response will be just the same with what is written in 27.4.4.2.	Change the two paragraphs in 27.4.4.3 as follows: "If an AP intends to solicit an immediate response in an SU PPDU the following apply: -- An AP shall set the Ack Policy field of the QoS Data and QoS Null frames to Normal Ack or Implicit Block Ack Request in at most one A-MPDU in the HE MU PPDU (see 10.3.2.10.1 (Acknowledgement procedure for DL MU PPDU in SU format) for an example of this sequence). -- The A-MPDUs in the HE MU PPDU other than the A-MPDU that solicits an immediate response shall not contain an Action Ack frame. A non-AP STA that receives an HE MU PPDU with an A-MPDU that solicits an immediate response shall follow the same acknowledgment procedure as in 27.4.4.2."	Rejected - Since management frame does not have the 'Ack policy' field, the AP cannot indicate the ack policy to be 'Normal Ack' or 'HTP Ack'. The response rules would be different depending on the ack policy. In 11ax, we decided to assume that the implicit ack policy would be 'HTP Ack' when management frame is carried in an HE MU PPDU. Hence, we disallow HE MU carrying management frame when the response is carried in HE SU PPDU format
13666	Tomoko Adachi	240.21	How can a recipient know the received HE SU PPDU is either of 1) to 3) cases? Similar comment to the one in 27.4.4.2, pp.11 239.16.	Change as follows: 1) If the HE MU PPDU or HE SU PPDU has no errors and is detected to carry an S-MPDU that is ... an Action frame soliciting an Ack frame, ... 2) If the HE MU PPDU or HE SU PPDU has no errors and is detected to carry a single-TID A-MPDU ...	Revised.- Agree in principle with the concern. The section is re-written to address broader comments which also addresses the particular issue pointed out in the comment

				3) Otherwise, the STA shall respond with a Multi-STA BlockAck frame as defined in 27.4.2 (Acknowledgement context in a Multi-STA BlockAck frame), carried in an SU PPDU.	TGax editor shall incorporate changes in 11-18-0027-04-00ax
13667	Tomoko Adachi		(Resubmitting the same problem pointed out by CID 9351.) What happens if the AP transmits in an A-MPDU with a Trigger frame, an Action frame soliciting an Ack frame, and QoS Data frames aggregated, but the non-AP STA only receives the Action frame? The STA should not respond for this case, however, it is not restricted to aggregate a Trigger frame, so the STA cannot determine whether it can respond or not. One approach would be to add a rule that when the STA received the PPDU with no errors and confirmed that it is an S-MPDU, it transmits an Ack frame, when the STA received an A-MPDU and received the first two MPDUs successfully (within these two MPDUs, there should be a Trigger frame if there is), it transmits a response frame accordingly, and otherwise the STA shall not transmit a response frame. But this is quite complicated. The other approach would be to just give it up, rely on the recovery mechanism, and follow the rules in 27.4.4 (in this case, as there are errors and cannot determine if it is a single TID A-MPDU, a response frame should be a M-BA by the rules in 27.4.4.2 or 27.4.4.3), but add a note in 27.4.4.4 that there is such risk.	Add a note at the end of 27.4.4.4 as follows: "NOTE--As an Action frame soliciting an Ack frame does not contain Ack Policy field, the non-AP STA responds with an SU PPDU when it fails to receive a Trigger frame or a frame with a UMRS Control field is present. This results in collision with the HE TB PPDU sent by the other non-AP STAs."	Rejected - The usecase raised does not lead to a problem. See explanation below: When management frame that solicits immediate response is carried in HE MU PPDU, the response is always sent using HE TB PPDU When management frame that solicits immediate response is carried in HE SU PPDU, the response may be using HE TB PPDU or using HE SU PPDU. There is no conflict of UL resource. AP will be able to receive the response either in HE TB PPDU, or in HE SU PPDU format
13907	Yongho Seok	240.01	"Responding to an HE MU PPDU or HE SU PPDU with an HE TB PPDU" How about is an HE ER SU PPDU? If an HE SU PPDU can solicit an HE TB PPDU, an HE ER SU PPDU can also solicit an HE TB PPDU.	Include an HE ER SU PPDU that solicit an HE TB PPDU. Otherwise, remove an HE SU PPDU.	Revised - Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax
13908	Yongho Seok	240.07	"If an Action frame or an MMPDU that solicits an immediate acknowledgement is carried in an HE MU PPDU, then the response is carried in an HE TB PPDU. A non-AP STA that receives an HE MU PPDU or HE SU PPDU with an A-MPDU that contains QoS Data or QoS Null frames addressed to it with Ack Policy field equal to HTP Ack, or an Action-Ack frame shall not respond if it has not received the UL resource allocation information either through UMRS Control field or a Trigger frame in the soliciting PPDU." How about is an action frame or an MMPDU carried in an HE SU PPDU? Can the response frame be carried in an HE TB PPDU?	Please clarify if the response frame of an action frame or an MMPDU carried in an HE SU PPDU can be carried in an HE TB PPDU.	Rejected - Response of a management frame that solicits immediate response that is carried in HE SU PPDU could be either using HE SU PPDU, or through HE TB PPDU. Both cases are already specified. Hence no further changes needed Section 27.4.4.2 already specifies that a management

					frame that solicits immediate response that is carried in HE SU PPDU may be responded with HE SU PPDU . Section 27.4.4.4 already clarifies that a management frame that solicits immediate response that is carried in HE SU PPDU may be responded with HE TB PPDU .
13909	Yongho Seok	240.33	"If the HE MU PPDU or HE SU PPDU carries a multi-TID A-MPDU that includes QoS Data frames or QoS Null frames with the Ack Policy field equal to HTP Ack, and an Action Ack frame, and either a Trigger frame or a frame with a UMRS Control field is present, then the STA shall respond with a Multi-STA BlockAck frame carried in the HE TB PPDU sent as a response." An ack-enabled A-MPDU can include an Action Ack frame. But, it is not covered by this bullet when an ack-enabled A-MPDU is a single-TID A-MPDU.	Add the rule for an ack-enabled A-MPDU.	Revised. - Agree in principle. TGax editor shall incorporate changes in 11-18-0027-04-00ax
14250	Yusuke Tanaka	237.61	The rules in this subclause need to be limited in HE devices but no description like "an HE STA shall"	As commented.	Rejected. The whole section of 27 is for HE. No need to replicate in each sub-sections
14251	Yusuke Tanaka	237.63	What is it "different" from?	Clarify.	Rejected - Different block ack lengths are specified in the next paragraph of the same section

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27.4 HE block acknowledgement procedure

27.4.1 Overview

[11807] The HE-immediate block acknowledge procedure builds on the features defined for HT-immediate block ack, with the following extensions:

- Support for a Multi-STA BlockAck frame
- Support for a Multi-STA BlockAckReq (MU-BAR) frame [11086]
- Support for a Multi-TID BlockAckReq frame
- Support for different BlockAck Bitmap lengths of 32, 64, 128 and 256 [13022]
- [13022] Acknowledging [13254] MPDUs from multiple STAs using a single Multi-STA BlockAck frame
- Acknowledging QoS Data frames with two or more TIDs using a Multi-STA BlockAck frame
- Acknowledging QoS Data frames with one or more TIDs, and a management frame using a Multi-STA BlockAck frame
- Acknowledging all MPDUs in the eliciting PPDU using a variant of Multi-STA BlockAck frame
- Pre-Association acknowledgment, which acknowledges pre-association management frames for multiple STAs using a single Multi-STA BlockAck frame
- [13256]

An HE STA shall [13257] be able to respond with Compressed BlockAck frames if HT-immediate block ack is supported in the role of recipient (see 10.24.7.1 (Introduction)). An HE STA shall be able to respond with Multi-STA BlockAck frame if multi-TID A-MPDU operation (27.10.4 (multi-TID A-MPDU and ack-enabled A-MPDU)) is supported in the role of recipient. A non-AP HE STA shall support reception of a Multi-STA BlockAck frame.

A non-AP HE STA that is associated with an AP and that sends a Multi-STA BlockAck frame shall set the AID11 subfield in the Per AID TID Info field of the Multi-STA BlockAck frame to 0 and the RA field to the MAC address of the intended recipient [13258].

An HE AP that sends a Multi-STA BlockAck frame where the Per AID TID Info fields are addressed to more than one STA shall set the RA field to the broadcast address. An HE AP that sends a Multi-STA BlockAck frame where the Per AID TID Info fields are all addressed to a single recipient STA in response to an HE TB PPDU may set the RA field of the Multi-STA BlockAck frame to either the address of the recipient STA or the broadcast address. An HE AP that sends a Multi-STA BlockAck frame where the Per AID TID Info fields are all addressed to a single recipient STA solicited by HE SU PPDU, HE ER SU PPDU or HE MU PPDU shall set the RA field to the address of the recipient STA. [12478] An HE AP that sends a Multi-STA BlockAck frame to an associated STA shall set the AID11 subfield in the Per AID TID Info field of the Multi-STA BlockAck frame to the 11 LSBs of the AID of the intended STA. An HE AP that sends a Multi-STA BlockAck frame to an un-associated STA shall set the AID11 subfield in the Per AID TID Info field of the Multi-STA BlockAck frame to 2045.

An HE STA that transmits a Multi-STA BlockAck frame shall use a rate, HT MCS, <VHT-MCS, NSS> tuple or <HE-MCS, NSS> tuple that is supported by all recipient STAs.

[13260] An HE STA that receives a Multi-STA BlockAck frame as a response to frames requiring acknowledgement, shall examine Per AID TID Info field received in the Multi-STA BlockAck frame, and shall process each Per AID TID Info field using the procedure defined in 27.4.2 (Acknowledgement context in a Multi-STA BlockAck frame). A non-AP HE STA [13260] that receives a Multi-STA BlockAck frame as a response to frames requiring acknowledgement from an HE STA that it has not established a block ack agreement with, shall examine each Per AID TID Info field received in the Multi-STA BlockAck frame as follows:

- If the Ack Type field is 1, then the Per AID TID Info field indicates either the acknowledgement of an [11740] EOF-MPDU that is a QoS Data frame when the TID of the Per AID TID Info field is less than 8, or an [11740] EOF-MPDU that is a management frame that solicits an immediate response or a PS-Poll frame when the TID field of the Per AID TID Info field is equal to 15. The BA Information field is intended to the STA if the AID of the BA Information field contains the STA's AID, and is processed according to the procedure defined in 27.4.2 (Acknowledgement context in a Multi-STA BlockAck frame).

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A non-AP HE STA that has established a block ack agreement with an HE STA shall examine each BA Information field received in the Multi-STA BlockAck frame from the HE STA and shall process each BA information according to the procedure defined in 27.4.2 (Acknowledgement context in a Multi-STA BlockAck frame).

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— If the Ack Type field is 0, the AID field is set to 2045, and the TID field is 15, then the Per AID TID Info field indicates the acknowledgment of an EOF-MPDU that is a Management frame that solicits an immediate response. The Per AID TID Info field contains an RA field which is the MAC address of the unassociated STA for which the Per AID TID Info subfield is intended. The BA Information field is intended to the STA if the RA field of the BA Information field contains the STA's MAC address, and is processed according to the procedure defined in 27.4.2 (Acknowledgement context in a Multi-STA BlockAck frame).

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An HE AP shall not send to the STA a Multi-STA BlockAck frame that has Per STA Info fields for STAs associated with more than one BSS in a multiple BSSID set unless the HE AP has received from the STA an HE Capabilities element with the Rx Control Frame To MultiBSS subfield in HE MAC Capabilities Information field set to 1.

An AP that transmits a Multi-STA BlockAck frame addressed to HE STAs shall set the TA field of the frame to the MAC address of the AP, except when dot11MultiBSSIDActivated is true and the Multi-STA BlockAck frame is directed to STAs from at least two different BSSs of the multiple BSSID set, in which case, the AP shall set the TA field of the frame to the transmitted BSSID.

A non-AP HE STA that is associated with a BSS corresponding to a nontransmitted BSSID and has indicated support for receiving Control frames with TA set to the Transmitted BSSID (via the Rx Control Frame To MultiBSS subfield set to 1 in HE Capabilities element that it transmits) shall, upon receiving an MU BAR Control frame with TA set to the transmitted BSSID, respond to an MU-BAR Trigger frame with RA set either to the (nontransmitted) BSSID of the BSS it is associated with or the transmitted BSSID (i.e., the TA of the soliciting MU-BAR Trigger frame).

An HE STA that transmits a Multi-TID BlockAckReq frame shall contain the TID Values of the Per TID Info subfields of the BAR Information field of the Multi-TID BlockAckReq frame for the MPDUs of which TIDs correspond to AC that has the same or higher priority with respect to the primary AC, except when the Multi-TID BlockAckReq frame is carried in an HE TB PPDU in which case the HE STA contains the TID Values of the Per TID Info subfields of the BAR Information field of the Multi-TID BlockAckReq frame for the MPDUs of which TIDs correspond to any AC.

An HE STA that transmits a BlockAckReq frame carried in an HE TB PPDU may contain the TID Values of the Per TID Info subfields of the BAR Information field of the BlockAckReq frame for the MPDUs of which TIDs correspond to any AC.

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27.4.2 Acknowledgement context in a Multi-STA BlockAck frame

A recipient of an [12820, 13263] A-MPDU shall set the Ack Type subfield and TID subfield in the Per AID TID Info field of the Multi-STA BlockAck frame sent as a response depending on the acknowledgement context as follows:

— An HE AP that receives an A-MPDU that includes one MPDU, and the MPDU is an EOF-MPDU that is a management frame that solicits immediate response, [12832, 11755, 13264] prior to association may generate a Multi-STA BlockAck frame using the procedure described in the pre-association ack context defined below in this section [12821].

— An HE STA that receives [12822, 13265] an A-MPDU that does not include an EOF MPDU but does include one or more non-EOF-MPDUs that are QoS Data frames with Ack Policy field equal to Normal Ack, or Implicit Block Ack Request belonging to the same block ack agreement may generate a Multi-STA BlockAck frame as follows:

- If all MPDUs in the AMPDU are received successfully, then the recipient may follow the procedure described in the All Ack context defined below.
- Otherwise, the recipient shall [11089, 12823] follow the procedure described in the BlockAck context defined below.

— [13265] An HE STA that supports ack-enabled aggregation by setting the Ack-Enabled Aggregation Support subfield in the HE MAC Capabilities Information field to 1, and if the A-MPDU includes an EOF-MPDU that is a Management frame that solicits an acknowledgement, and one or more MPDUs (either EOF-MPDUs or non-EOF-MPDUs) that are QoS Data frames with the Ack Policy field equal to Normal Ack, or Implicit Block Ack Request, then the recipient shall generate Multi-STA BlockAck frame as follows [11756]:

- If all the MPDUs in the AMPDU are received successfully, then the recipient may follow the procedure described in the All Ack context.

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Otherwise :

- For the MPDU that is a management frame, the recipient shall create a Per AID TID info field using the procedure described below in Ack context with the TID value set to 15.
- For the EOF-MPDUs that are QoS data frames, the recipient shall create a Per AID TID info field using the procedure described below in Ack context with the TID set to the TID of the QoS Data frame.
- For the non-EOF-MPDUs that are QoS data frames, the recipient shall create a Per AID TID info field using the procedure described below in BlockAck context with the TID set to the TID of the QoS Data frame.

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If the EOF delimiter field of the non-zero length MPDU is set to 0, the recipient shall create a per AID TID info field using the procedure described in BlockAck context ¶

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— [13266] An HE STA that supports multi-TID aggregation and if the A-MPDU does not include an EOF MPDU but does include non-EOF-MPDUs that are QoS Data frames with Ack Policy field equal Implicit Block Ack Request and are belonging to more than one block ack agreement, then the recipient shall generate a Multi-STA BlockAck frame as follows:

- If all MPDUs in the A-MPDU are received successfully, then the recipient may follow the procedure described in the All Ack context
- Otherwise, for each TID included the received A-MPDU, the recipient shall create a per AID TID info field using the procedure described in BlockAck context with the TID set to the TID of the QoS Data frame

NOTE – The maximum number of Per AID TID Info fields that the STA is capable of including in the Multi-STA BlockAck frame for the same value of the AID field is indicated in the Multi-TID Aggregation Rx Support field of HE Capabilities element it transmits.

The procedure for different acknowledgment context for generating Multi-STA BlockAck frame is defined below:

- All Ack context: if the originator had set the All Ack Support subfield in the HE Capabilities element to 1, then the recipient may set the Ack Type field to 1 and the TID subfield to 14 to indicate the successful reception of all the MPDUs carried in the eliciting A-MPDU or multi-TID A-MPDU. Otherwise the recipient shall not set the Ack Type field to 1 and the TID subfield to 14. The Multi-STA BlockAck frame shall contain only one Per AID TID Info field addressed to an originator in the Multi-STA BlockAck frame.
- Pre-association ack context: A recipient receiving a [12745] Management frame from the unassociated STA, that requires an acknowledgment, shall set the Ack Type field to 0, AID subfield to 2045, and the TID field to 15 in the Per AID TID Info field, and the RA field of the Per AID TID Info field to the intended recipient's MAC address to indicate the successful reception of that management frame.
- Ack context: If the recipient had set the Ack-Enabled [12739] Aggregation Support subfield in the HE Capabilities element to 1, then the recipient receiving an [11740] EOF-MPDU, that requires an acknowledgment, shall set the Ack Type field to 1 and the TID field to the TID value of if that EOF-MPDU is a QoS Data frame or to the TID value of 15, if the EOF-MPDU is a management frame or PS-Poll frame.

If a received A-MPDU contains more than one EOF-MPDUs that solicits an immediate acknowledgment, then the Multi-STA BlockAck frame shall contain multiple occurrences of AID TID Info fields, with Ack Type field equal to 1, one for each such successfully received EOF-MPDU [12479]

The allowed values for the TID field in this context are 0 to 7 (for indicating acknowledgement of QoS Data or QoS Null frames) or 15 (for indicating acknowledgement of management frame or PS Poll frame [12631]) [12482]

- BlockAck context: The recipient shall set the Ack Type field to 0 and the TID field of a Per AID TID Info field to the TID value of MPDUs requesting block acknowledgement that are carried in the eliciting A-MPDU or multi-TID A-MPDU.

The Multi-STA BlockAck frame may contain multiple occurrences of these Per AID TID Info fields addressed to an originator, one for each MPDU that is requesting block acknowledgement, in which case the Block Ack Starting Sequence Control and Block Ack Bitmap fields shall be set according to 10.24.7 (HT-immediate block ack extensions) for each block ack session, and according to Error! Reference source not found, for each block ack session with dynamic fragmentation.

The allowed values for the TID field in this context are 0 to 7 (for indicating block acknowledgement of QoS Data frames).

Variable bitmap lengths can be included in the Per AID TID Info field when the originator and recipient negotiate their use as defined in Negotiation of block ack bitmap lengths.

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Upon reception of the Multi-STA BlockAck frame the originator shall examine each Per AID TID Info field and shall perform the following operations for each Per AID TID Info field that has an AID field addressed to the originator (i.e., the AID subfield is an AID if the originator is a non-AP STA, is 0 when the originator is an AP, and is 2045 when the originator is an unassociated HE STA):

- If the Ack Type field is 0 and the TID field is less than 8 then the BlockAck Starting Sequence Control, TID and BA Bitmap fields of the Per AID TID Info field are processed according to 10.24.7 (HT-immediate block ack mechanism), Error! Reference source not found., and as defined below.
- If the Ack Type field is 0 and the TID field is 15, then the Per AID TID Info field indicates the acknowledgement of a single management frame sent by the unassociated STA as defined by the acknowledgement context.
- If the Ack Type field is 1 and the TID is less than or equal to 7 or is equal to 15, then the Per AID TID Info field indicates the acknowledgement of an [11740] EOF-MPDU, that is a QoS Data frame identified by the value of the TID, a management frame frame [12631] or a PS-Poll frame.
- If the Ack Type field is 1 and the TID subfield of AID TID Info field is 14, then the Per AID TID Info field indicates the acknowledgement of all MPDUs carried in the eliciting PPDU as defined by the acknowledgement context.

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27.4.3 Negotiation of block ack bitmap lengths

Both the Compressed BlockAck frame and Multi-STA BlockAck frame allow different Block Ack Bitmap subfield lengths. The length of the Block Ack Bitmap subfield is indicated in the Fragment Number subfield of the Block Ack Starting Sequence Control field as defined in 9.3.1.9 (BlockAck frame format). The Block Ack Bitmap subfield length in bits of a BlockAck frame used during a BA session depends on the negotiated buffer size between the originator and the recipient as indicated below:

- When a Compressed BlockAck frame is used, the recipient shall follow the rules below [13269]:
 - A recipient shall not transmit a Compressed BlockAck frame with a BlockAck Bitmap field with a length greater than 64 unless the negotiated buffer size is greater than 64
 - If the negotiated buffer size is within [65, 256] then a BlockAck Bitmap length of either 64 or 256 shall be used during the BA session.
- When a Multi-STA BlockAck frame is used, the recipient shall follow the rules below [13269]:
 - A recipient shall not include in a Multi-STA BlockAck frame a Per AID TID Info field with a 32-bit BlockAck Bitmap field addressed to an originator if the 32-bit BA Bitmap Support field in the HE MAC Capabilities Information field in the HE Capabilities element received from that originator is 0.
 - A STA shall not transmit a Multi-STA BlockAck frame with a BlockAck Bitmap field with a length greater than 64 unless the negotiated buffer size is greater than 64. If the negotiated buffer size is within [1, 64] then a BlockAck Bitmap length of either 32 or 64 shall be used during the BA session, with the restrictions listed above.
 - A STA shall not transmit a Multi-STA BlockAck frame with a BlockAck Bitmap field with a length greater than 128 unless the negotiated buffer size is greater than 128. If the negotiated buffer size is within [65, 128] then a BlockAck Bitmap length of 32, 64 or 128 shall be used during the BA session, with the restrictions listed above
 - If the negotiated buffer size is within [129, 256] then a BlockAck Bitmap length of 32, 64, 128 or 256 shall be used during the BA session, with the restrictions listed above

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The recipient shall not include in the Buffer Size field of an ADDBA Response frame a value that would cause the BlockAck Bitmap length of its block ack responses to exceed the BlockAck Bitmap length that is derived by the Buffer Size field of the ADDBA Request frame sent by the originator. When the Buffer Size field in the ADDBA Request frame is set to 0, the Buffer Size field of an ADDBA Response frame is within [1, 64].

[13269]

NOTE—A Multi-STA BlockAck frame might include Per AID TID Info fields with a 32-bit BlockAck Bitmap field addressed to other originators and the nonsupporting originator needs to be able to parse these fields to locate a possible Per AID TID Info field addressed to it.

A recipient that is the intended receiver of a [13272] (multi-TID) BlockAckReq frame, MU-BAR Trigger frame, GCR MU-BAR Trigger frame or a (multi-TID) A-MPDU that solicits an immediate BlockAck frame response for each TID shall follow the rules defined in 10.24.7 (HT-immediate block ack extensions) except that:

- *WinSize_R* is set to the smaller of *BitmapLength* and the value of the Buffer Size field of the associated ADDBA Response frame that established the block ack agreement, where the *BitmapLength* is the largest value for the BlockAck Bitmap [12485]
- The Starting Sequence Number subfield of the Block Ack Starting Sequence Control subfield shall be set to any value in the range from (*WinEnd_R* – *BitmapLength* + 1) to *WinStart_R*
- The values in the recipient's record of status of MPDUs beginning with the MPDU for which the Sequence Number subfield value is equal to *WinStart_R* and ending with the MPDU for which the Sequence Number subfield value is equal to *WinEnd_R* shall be included in the BlockAck Bitmap, wherein the length of the BlockAck Bitmap field shall be greater than or equal to *WinEnd_R* – *WinStart_R*

[13270] The originator of a (multi-TID) BlockAckReq frame, MU-BAR Trigger frame, GCR MU-BAR Trigger frame or a (multi-TID) A-MPDU that includes QoS Data frames or management frame that solicits an immediate BlockAck frame response shall [12484] set the Duration field value accounting for the largest BlockAck Bitmap length based on negotiated buffer size.

[13276, 11091]

If a STA sets the HE Fragmentation Support subfield in the HE Capabilities element to 3, then the LSB of the Fragment Number subfield of the BA frame may be set to 1. If the LSB of the Fragment Number subfield of the BA frame is set to 1, then the BA Bitmap fields are re-mapped as defined in **Error! Reference source not found.**

27.4.4 Per-PPDU acknowledgment selection rules

27.4.4.1 General

A STA that [11092, 11810] transmits a PPDU can solicit different immediate responses for the frames contained in the PPDU by using the Ack Policy field of QoS Data or QoS Null frames, the type of the frame (e.g., [12486] the type of management frame, (multi-TID) BAR, MU-BAR Trigger frame, GCR MU-BAR Trigger frame, etc.), [12891] number of TIDs in the AMPDU and the EOF field setting of the delimiter.

27.4.4.2 Responding to an HE SU PPDU or HE ER SU PPDU with an SU PPDU

An HE STA that receives an HE SU PPDU or an HE ER SU PPDU with an A-MPDU that contains MPDUs that solicits acknowledgment and that does not include a Trigger frame, or a frame with UMRS Control field, shall respond using an SU PPDU as follows [13663]:

- 1) If the [13664] A-MPDU includes only one MPDU, and the MPDU is an EOF-MPDU [that is either a QoS Data frame or QoS Null frame with the Ack Policy field equal to Normal Ack, or [12486, 12889] a management frame that solicits acknowledgement], then the STA shall respond with an Ack frame.
- 2) If the HE STA supports ack-enabled aggregation by setting the Ack-Enabled Aggregation Support subfield in the HE MAC Capabilities Information field to 1, and if the A-MPDU includes more than one MPDU, only one of which solicits acknowledgement and the MPDU that solicits acknowledgement is an EOF MPDU that is a QoS Data frame or a QoS Null frame with Ack Policy subfield equal to Normal Ack, or a management frame that solicits acknowledgement, then the HE STA shall respond with an Ack frame.
- 3) If the A-MPDU does not include an EOF MPDU but does include one or more non-EOF-MPDUs that are QoS Data frames [11758, 12888] belonging to the same block ack agreement and with the Ack Policy field equal to Implicit Block Ack Request for at least one MPDU, then the STA shall either respond with

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Moved up [1]: A recipient shall not include in a Multi-STA BlockAck frame a Per AID TID Info field with a 32-bit BlockAck Bitmap field addressed to an originator if the 32-bit BA Bitmap Support field in the HE MAC Capabilities Information field in the HE Capabilities element received from that originator is 0.

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a Compressed BlockAck frame as defined in 10.24.7.5 [12487], or a Multi-STA BlockAck frame with the Ack Type field set to 1 and the TID field set to 14 as defined in 27.4.2 (Acknowledgement context in a Multi-STA BlockAck frame) if the recipient has indicated the all ack support by setting the All Ack Support subfield in the HE MAC Capabilities Information field to 1.

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4) If the HE STA supports ack-enabled aggregation by setting the Ack-Enabled Aggregation Support subfield in the HE MAC Capabilities Information field to 1, and if the A-MPDU includes a management frame that solicits an acknowledgement, and one or more QoS Data frames with the Ack Policy field equal to Normal Ack, or Implicit Block Ack Request, then the STA shall respond with a Multi-STA BlockAck frame as defined in 27.4.2 (Acknowledgement context in a Multi-STA BlockAck frame).

5) If the HE STA supports multi-TID aggregation and if the A-MPDU includes two or more QoS Data frames [11759, 12888] with the Ack Policy field equal to Implicit Block Ack Request and are belonging to more than one block ack agreement, [12486, 12887], then the STA shall respond with a Multi-STA BlockAck frame as defined in as defined in 27.4.2 (Acknowledgement context in a Multi-STA BlockAck frame).

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27.4.4.3 Responding to an HE MU PPDU with an SU PPDU

If an AP intends to solicit an immediate response in an SU PPDU the following apply:

- An AP shall set the Ack Policy field of the QoS Data and QoS Null frames to Normal Ack or Implicit Block Ack Request in at most one A-MPDU in the HE MU PPDU (see 10.3.2.10.1 (Acknowledgement procedure for DL MU PPDU in SU format) for an example of this sequence).
- The A-MPDUs in the HE MU PPDU shall not contain [12630] a management frame that solicits a response.

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A non-AP HE STA that receives an HE MU PPDU with an A-MPDU that contains MPDUs that solicits acknowledgment and that does not include a Trigger frame, or a frame with UMRS Control field shall respond using an SU PPDU as follows:

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1) If the A-MPDU carries only one MPDU and the MPDU is an EOF-MPDU that is either a QoS Data frame or QoS Null frame addressed to it and with the Ack Policy field equal to Normal Ack, then the STA shall respond with an Ack frame carried in an SU PPDU.

2) If the HE STA supports ack-enabled aggregation by setting the Ack-Enabled Aggregation Support subfield in the HE MAC Capabilities Information field to 1, and if the A-MPDU includes more than one MPDU, only one of which solicits acknowledgement and the MPDU that solicits acknowledgement is an EOF MPDU that is a QoS Data frame or a QoS Null frame with Ack Policy subfield equal to Normal Ack, then the HE STA shall respond with an Ack frame.

3) If the A-MPDU does not include an EOF MPDU but does include one or more non-EOF-MPDUs that are QoS Data frames [11762] belonging to the same block ack agreement and with the Ack Policy field equal to Implicit Block Ack Request for at least one MPDU, then the STA shall either respond with a Compressed BlockAck frame as defined in 10.24.7.5 [12487], or a Multi-STA BlockAck frame with the Ack Type field set to 1 and the TID field set to 14 as defined in 27.4.2 (Acknowledgement context in a Multi-STA BlockAck frame) if the recipient has indicated the all ack support by setting the All Ack Support subfield in the HE MAC Capabilities Information field to 1.

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NOTE—A control response frame carried in an SU PPDU that is an immediate response to an HE MU PPDU follows the rules defined in 10.7.6.5 (Rate selection for control response frames).

27.4.4.4 Responding to an HE MU PPDU or HE SU PPDU or HE ER SU PPDU [13907] with an HE TB PPDU

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An AP that sends an HE MU PPDU or HE SU PPDU or HE ER SU PPDU that solicits an immediate response carried in an HE TB PPDU shall set the Ack Policy to HTP Ack for each of the [12896] QoS Data frames for which it intends to solicit an immediate response (see 10.3.2.10.2 (Acknowledgement procedure for DL MU PPDU in MU format) [13515]. If [12631] a management frame that solicits an immediate acknowledgement is carried in an HE MU PPDU, then the response is carried in an HE TB PPDU. A non-AP STA that receives an HE MU PPDU or HE SU PPDU or HE ER SU PPDU with an A-MPDU that contains QoS Data [11763, 13517] addressed to it with Ack Policy field equal to HTP Ack, or [12486, 12897] a management frame that solicits an immediate acknowledgement, shall not respond if it has not received the UL resource allocation information either through UMRS Control field or a Trigger frame in the soliciting PPDU.

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27.4.4.5 Responding to an HE TB PPDU with a DL SU PPDU

A non-AP STA that sends an HE TB PPDU as a response to a Basic Trigger frame that solicits an immediate response shall set the Ack Policy [12899, 13279] of the QoS Data frames or QoS Null frames to Normal Ack/Implicit Block Ack Request (see 10.3.2.10.3 (Acknowledgement procedure for an UL MU transmission) for an example of this sequence).

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[12900] If the HE TB PPDU carries MPDUs only from one STA and if the HE AP intends to send the response in a DL SU PPDU format, then the HE AP shall respond using DL SU PPDU as follows:

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1) If the A-MPDU includes only one MPDU, and the MPDU is an EOF-MPDU that is either a QoS Data frame or QoS Null frame with the Ack Policy field equal to Normal Ack, or a management frame that solicits acknowledgement, then the HE AP shall respond with either an Ack frame or a Multi-STA BlockAck frame with the Ack Type field set to 1.

2) If the HE AP supports ack-enabled aggregation by setting the Ack-Enabled Aggregation Support subfield in the HE MAC Capabilities Information field to 1, and if the A-MPDU includes more than one MPDU, only one of which solicits acknowledgement and the MPDU that solicits acknowledgement is an EOF-MPDU that is a QoS Data frame or a QoS Null frame with Ack Policy subfield equal to Normal Ack, or a management frame that solicits acknowledgement, then the HE AP shall respond with an Ack frame or a Multi-STA BlockAck frame with the Ack Type field set to 1.

3) If the A-MPDU does not include an EOF-MPDU but does include one or more non-EOF-MPDUs, that are QoS Data frames belonging to the same block ack agreement and with the Ack Policy field equal to Implicit Block Ack Request for at least one MPDU, then the HE AP shall respond with a Compressed BlockAck frame as defined in 10.24.7.5, or a Multi-STA BlockAck with the Ack Type field set to 1 and the TID field set to 14 if the recipient has indicated the all ack support by setting the All Ack Support subfield in the HE MAC Capabilities Information field to 1 or a Multi-STA BlockAck frame with the Ack Type field set to 0 as defined in 27.4.2 (Acknowledgement context in a Multi-STA BlockAck frame).

4) If the HE AP supports ack-enabled aggregation by setting the Ack-Enabled Aggregation Support subfield in the HE MAC Capabilities Information field to 1, and if the A-MPDU carries a management frame that solicits acknowledgement, and one or more QoS Data frames with the Ack Policy field equal to Implicit Block Ack Request, then the HE AP shall respond with a Multi-STA BlockAck frame as defined in Acknowledgement context in a Multi-STA BlockAck frame as defined in 27.4.2 (Acknowledgement context in a Multi-STA BlockAck frame).

5) If the HE AP supports multi-TID aggregation and if the A-MPDU includes two or more QoS Data frames, with the Ack Policy field equal to Normal Ack or Implicit Block Ack Request and are belonging to more than one block ack agreement, then the HE AP shall respond with a Multi-STA BlockAck frame as defined in Acknowledgement context in a Multi-STA BlockAck frame.

If the HE TB PPDU carries MPDUs from more than one STA, and if the AP sends the response in DL SU PPDU, then the AP shall respond with a Multi-STA BlockAck frame carried in a DL SU PPDU format that contains the appropriate settings in each Per AID TID Info field intended to each STA as defined in 27.4.2 (Acknowledgement context in a Multi-STA BlockAck frame).

27.4.4.6 Responding to an HE TB PPDU with an HE MU PPDU

A non-AP STA that sends an HE TB PPDU as a response to a Basic Trigger frame that solicits an immediate response shall set the Ack Policy to Normal Ack/Implicit Block Ack Request for each of the QoS Data frames carried in the A-MPDU (see 10.3.2.10.3 (Acknowledgement procedure for an UL MU transmission) for an example of this sequence).

If an HE AP sends response to an HE TB PPDU that it received using an HE MU PPDU, then the AP shall respond to each A-MPDU that it received using the following procedure:

1) If the A-MPDU received from a STA includes only one MPDU, and the MPDU is an EOF-MPDU that is either a QoS Data frame or QoS Null frame with the Ack Policy field equal to Normal Ack, or a management frame that solicits acknowledgement, then the STA shall respond with an Ack frame or a Multi-STA BlockAck frame with the Ack Type field set to 1 carried in the HE MU PPDU.

2) If the HE AP supports ack-enabled aggregation by setting the Ack-Enabled Aggregation Support subfield in the HE MAC Capabilities Information field to 1, and if the A-MPDU includes more than one MPDU, only one of which solicits acknowledgement and the MPDU that solicits acknowledgement is an EOF-MPDU that is a QoS Data frame or a QoS Null frame with Ack Policy subfield equal to Normal Ack, or

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- a management frame that solicits acknowledgement, then the HE AP shall respond with an Ack frame or a Multi-STA BlockAck frame with the Ack Type field set to 1 carried in the HE MU PPDU.
- 3) If the A-MPDU does not include an EOF MPDU but does include one or more non-EOF-MPDUs that are QoS Data frames belonging to the same block ack agreement and with the Ack Policy field equal to Implicit Block Ack Request for at least one MPDU, then the HE AP shall respond with a Compressed BlockAck frame as defined in 10.24.7.5, a Multi-STA BlockAck with the Ack Type field set to 1 and the TID field set to 14 or a Multi-STA BlockAck frame with the Ack Type field set to 0 as defined in 27.4.2 (Acknowledgement context in a Multi-STA BlockAck frame) carried in the HE MU PPDU.
 - 4) If the HE AP supports ack-enabled aggregation by setting the Ack-Enabled Aggregation Support subfield in the HE MAC Capabilities Information field to 1, and if the A-MPDU carries a management frame that solicits acknowledgement, and one or more QoS Data frames with the Ack Policy field equal to Implicit Block Ack Request, then the HE AP shall respond with a Multi-STA BlockAck frame as defined in Acknowledgement context in a Multi-STA BlockAck frame as defined in 27.4.2 (Acknowledgement context in a Multi-STA BlockAck frame), carried in the HE MU PPDU.
 - 5) If the HE AP supports multi-TID aggregation and if the A-MPDU includes two or more QoS Data frames, with the Ack Policy field equal to Implicit Block Ack Request and are belonging to more than one block ack agreement, then the HE AP shall respond with a Multi-STA BlockAck frame as defined in 27.4.2 (Acknowledgement context in a Multi-STA BlockAck frame).

[12913]

The AP may respond with group addressed Multi-STA BlockAck frame(s) in an HE MU PPDU if [12489, 12831] the intended receivers of the frame have set the Group Addressed Multi-STA BlockAck In DL MU Support [12489] subfield of the HE MAC Capabilities Information field to '1'. The Ack Type field shall be set according to the acknowledgement context. [12831] If an HE AP chooses to send a group addressed Multi-STA BlockAck frame in an HE MU PPDU to a non-AP HE STA n , then the HE AP shall only transmit the frame on the broadcast RU (26/52/106/242/484/996) (see 28.3.10.8.6 (HE-SIG-B per-user content)) that includes the RU used for receiving the immediately preceding HE TB PPDU from STA n . There shall be no more than one group addressed Multi-STA BlockAck frame carried in a broadcast RU of the HE MU PPDU.

27.4.5 HE block acknowledgment request and response rules

An HE AP may solicit BlockAck frame responses from multiple HE STAs using an MU-BAR Trigger frame or GCR MU-BAR Trigger frame. The MU-BAR Trigger frame shall contain either Compressed BlockAckReq variant or Multi-TID BlockAckReq variant in each of the Per User Info fields. An HE AP shall not send a Multi-TID BlockAckReq (neither as part of a Per User Info field intended to the STA in an MU-BAR Trigger frame nor as a BAR frame) to a STA that has not indicated support for multi-TID A-MPDU. (Multi-TID) BlockAckReq, BlockAckReq, GCR MU-BAR Trigger, and MU-BAR Trigger frames indicate the length of the solicited block ack responses according to the FN settings defined in 9.3.1.9 (BlockAck frame format). [12750, 12866, 12867, 13150]

An HE STA that receives a BlockAckReq frame or an MU-BAR Trigger frame that contains a Compressed BlockAckReq variant in the User Info field addressed to the STA, or a GCR MU-BAR Trigger frame that contains a Compressed BlockAckReq variant in the Common Info field shall respond with a Compressed BlockAck frame as defined in 10.24.7 (HT-immediate block ack extensions) or a Multi-STA BlockAck frame as defined in HE block acknowledgement procedure, with Starting Sequence Number subfield set to the Starting Sequence Number subfield of the Block Ack Request Starting Sequence Control subfield and the length of the Block Ack Bitmap subfield calculated as defined in Negotiation of block ack bitmap lengths.

An HE STA that receives a Multi-TID BlockAckReq frame or an MU-BAR Trigger frame that contains a Multi-TID BlockAckReq variant in the User Info field addressed to the STA or a GCR MU-BAR Trigger frame that contains a Multi-TID BlockAckReq variant in the Common Info field shall respond with a Multi-STA BlockAck frame that contains a Per AID TID Info field with a Block Ack Bitmap subfield for each of the TIDs (with values less than 8) contained in the BlockAckReq frame, with Starting Sequence Number subfield set to the Starting Sequence Number subfield of the Block Ack Request Starting Sequence Control subfield and the length of the Block Ack Bitmap subfield calculated as defined in Negotiation of block ack bitmap lengths.

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3.1 Definitions

Instruction to editor: Insert the following [11740]

EOF-MPDU: An MPDU carried in an A-MPDU subframe that has the EOF field in the MPDU delimiter set to 1.

non-EOF-MPDU: An MPDU carried in an A-MPDU subframe that has the EOF field in the MPDU delimiter set to 0.

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