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Resolutions of Ballot on Draft Standard D4.0

Comments WITH RESPONSES on clauses 5 through 9

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1	11.3 also 11.1.3.2 .1 also 8.1	mif	T	n	There is nothing specified, either procedurally or in the MAC MIB to define an upper bound on the time between receipt of an Associate or Reassociate request at an AP and the generation of the expected response. This leaves open the possibility of independently–implemented stations and APs, both of which are fully conformant with this standard, but which are NOT INTEROPERABLE! In particular, in the case where the AP never responds to these requests before the STA has ceased listening. For power-managed stations, waiting "forever" is a poor alternative. I strongly recommend that we apply the time limits already in the MIB for aMinProbeResponseTime and aMaxProbeResponseTime to the request/response exchanges for Association, Reassociation, and Authentication (for each step in the authentication sequence), as well as for Probe. There also needs to be a constraint that the AP (or responder in the case of Probes and Authentication sequences in an IBSS) make its first attempt to transmit the response within aMinProbeResponse of receipt of a valid request. The requirement for conformance & interoperability is to have an upper bound on the response time between successful receipt of the request and the first attempt to obtain control of the medium to transmit the response. With this time interval known, there is	Add a sentence to each sub-section which defines when response frames are sent. The general format of this sentence is: "The station shall generate and attempt to transmit a XXX Response frame within aMinProbeResponeTime of receipt of a valid XXX Request frame."	Duplicated as #22 in 96/106-4. Will be processed there because the subject text is primarily in Clause 11. DECLINED SEE 96/106–4r1, #22 FOR FULL RESPONSE

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					a basis for interoperability that allows local decisions at the stations as to how much longer (if any) to wait due to medium access delays, and whether to retry, look elsewhere, etc.		
2	3.	kba	e		DSS definition, first line: change "distributions" to "distribution"		Editorial ACCEPTED.
3	3.	jz	t		I think the definition of Authenticate is incomplete. Establishing the identity *as one of a particular set of authorized stations* constitutes authentication.	The service used to ~~adequately~~ establish the identity of one station <u>as a member of the set of stations authorized to associate with</u> ~~to~~ another station.	Editorial ACCEPTED.
4	3.	jz	t		802.11 no longer has a concept of "ESS Basic Rate Set". There is a BSS Basic Rate Set, and the PHY Mandatory Rate Set. So we need to change either the definitions or clause 9.	Change "ESS" to "BSS" and strike the sentence about being preset for all stations in an ESS.	Editorial ACCEPTED.
5	3.	jz	t		Define MMPDU.	**MAC Management Protocol Data Unit (MMPDU).** The unit of data exchanged between two peer MAC entities to implement the MAC Management protocol.	Editorial ACCEPTED.
6	4.	kba	t		Define Station Identifier defined by SID and used in 5.7.2		**Definition of SID is already present. NO CHANGE REQUIRED**
7	4.	jz	E		Define all acronyms and abbreviations. Add these:	CS = Carrier Sense CW = Contention Window EIFS = Extended Inter-Frame Space LRC = Long Retry Count RF = Radio Frequency SLRC = Station Long Retry Count SRC = Short Retry Count SSID = Service Set Identifier SSRC = Station Short Retry Count	Editorial ACCEPTED
8	5.1.1.2	th	e		The term "hidden" is never adequately defined in the draft standard.	In 5.1.1.2, add to the last item of the list ("e"), after the words "every other STA is invalid" the following text: "(STAs may be "hidden" from each other)".	Editorial ACCEPTED

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9	5.2	kba	t		BSS dfinition here, and CF dfinition in 3., both use "shall" and for a duplicate purpose. Should there be a coresponding PICS item in Annex A?		**Editorial** **A PICS entry is not required for every "SHALL" in these introductory clauses. The specific behavior of the stations is defined in later clauses. This behavior is what can be observed in the conformance test process, and is where the PICS entries are needed (and present). NO CHANGE REQUIRED**
10	5.3	jz	e		Rephrase to sound better	802.11 explicitly ~~decided~~ does not ~~to~~ specify ~~specific~~ the details of DS implementations.	**Editorial** **ACCEPTED**
11	5.3	jz	t		Isn't Power Management an architectural service? I don't know where it fits in, but it seems like clause 5 ought to mention this relatively important and complex piece of the architecture.		**Editorial, grouped w/#39** **(because this clause contains an architectural overview and the necessary power management functionality is specified in subsequent normative clauses) Power-Management and MSDU Delivery are not included in Sec.5.4. Power Management is type of MSDU delivery mech. DECLINED**
12	5.3.3	kba	E		"IETF Mobile IP" is mentioned without providing any refernce.	Add the complete reference as a footnote.	**Editorial** **ACCEPTED** **Text not yet updated because none of the attendees had the appropriate document with them and a search of IETF's RFC index did not yield the desired document number.**
13	5.3.3	jz	e		Reference is wrong	(see clause 7.1.3.3.3~~4~~)	**Editorial** **Fixed the reference to 7.1.3.3.1 from clause 4 and fixed additional references which were**

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							incorrect in 5.4 ACCEPTED
14	5.4	kba	e		In forth paragraph change "data service" to "Data Service" to match clause 6.		Editorial ACCEPTED
15	5.4	jz	e		References to other clauses are all wrong		Editorial ACCEPTED
16	5.4	kba	t		Paragraph four mentions three types of messages but paragraphs four and five only define two of them.	Extend paragraph five with a definition of Control messages.	Editorial Added a new paragraph ACCEPTED
17	5.4.1.1	kba	e		In paragraph six, and all other places in the draft standard, remove the use of underlining as a way to emphasize a word, i.e., "How" here.		Editorial ACCEPTED
18	5.4.1.1	kba	e		In paragraph six, last line, change "related (...) services to "related services (...)".		Editorial ACCEPTED
19	5.4.1.1	kba	e		In paragraph seven, and in all other places in the draft standard, remove the quotes from lower case words such as "input". If they are important enough to be quoted then define them, use upper case ane do not use quotes either. Otherwise they just tend to make the draft standard harder to read and time consuming looking for the quoted references.		Editorial Not changed because this will be handled by IEEE editors
20	5.4.1.1	jjk	e	n	clause number is wrong at end of section	(Refer to clause 74 for details)	Editorial ACCEPTED
21	5.4.2.1	jz	e		Unless my suggestion about changing "independent" to "autonomous" throughout the document when referring to what we now call an IBSS is adopted, the term "independent Extended Service Set" in item c) is confusing.	Change "an independent" to "a different"	Editorial ACCEPTED
22	5.4.2.4	kba	e		In paragraph four, dhange "(STA" to "(non-AP STA" to match the rest of the draft standard.		Editorial ACCEPTED
23	5.4.2.4	kba	e		In the last paragraph, change "(" and ")." to ". (" and ".)"		Editorial ACCEPTED
24	5.4.2.4	jz	T		It is physically impossible to implement the normative requirement "STAs shall Disassociate whenever they leave a network".	Insert "attempt to" or something like that, to cover cases where STA moves out of the BSA before it knows it.	Editorial Change sentence to: "Stations shall attemt to disassociate prior to leaving the

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							network." ACCEPTED
25	5.4.3	kba	t		In paragraph one, third line, "non-shared" is wrong; 802.3 and 802.4 definately use a shared media!	Replace "closed, non shared" with "physically closed and controlled" and replace "open, shared" with "physically open"	Editorial ACCEPTED
26	5.4.3.1	kba	e		In paragraph six, and in all other places in the draft standard, remove the use of single quotes from upper case words such as "Open System". They are not needed. Also, define the upper case phrase Open System.		Editorial Inconsistent use of quotation marks will be handled by the IEEE editors. Definition reference added ACCEPTED
27	5.4.3.1	jz	e		Rephrase to sound better	If desired, an 802.11 network ~~can~~ may be operated using ~~run with~~ 'Open System' authentication. […] In an Open System, any~~one~~ station is allowed to become authenticated.	Editorial ACCEPTED
28	5.4.3.1	jz	t		Change "can" to "may" in last sentence, since this is normative text.		Editorial ACCEPTED
29	5.4.3.2	kba	t		In the paragraph four, if Deauthentication is a notification and not a request then change "shall not be refused" to "can not be refused". There are other instances of this that need to be changed also.		Editorial, but not changed because a better wording that did not change the meaning was not found. Commenter has accepted this explanation. DECLINED
30	5.5	jz	t		There are several uses of "shall" that are confusing. They make it sound like the station automatically becomes authenticated when it receives a Deauthentication frame (analogous verbiage to "upon receipt of the acknowledgment, the station shall become authenticated with the AP). Also, there are cases where the state transitions are wrong – z.B. a station that is in state 1 does *not* go to state 2 if for some weird reason it receives a disassociation frame! Also, it is not clear that APs are always in state 3 regardless of whether they have talked to anyone yet. Otherwise a PC cannot have a CFP until someone has associated.	<<I'll rephrase the whole section during the meeting if anyone agrees that the text here is as messed up as I think it is.>>	Editorial Did not change reportedly confusing "shalls" since the comment resolution group did not believe there were actual flaws in the text, and did not have time to wordsmith to ensure no change of meaning. Changed the text to clarify that station changes to state 2 upon disassociation only if in state 3.

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							Statement added to 5.5 to indicate that AP is always in state 3 (with respect to the DS) because it is inherently able to communicate with the DS. This is a clarification of existing functionality regarding access to and communication with/over the DS. This does not change the requirement that stations authenticate with an AP before communicating via the DS. **PORTIONS ACCEPTED**
31	5.5.3.3	kba	e		In paragraph three, change "assumed by" to "implicit in".		Editorial **ACCEPTED**
32	5.6	kba	e		Change "only be" to "only".		Editorial **ACCEPTED**
33	5.7.1	jz	e		Change "In an ad hoc case" to "In an autonomous BSS" or "In an ABSS" (see my general comment). Ad hoc is old nomenclature.		Editorial **ACCEPTED**
34	5.7.1	th	t		This clause ("Data") states that in an ESS a Data message "shall be handled by the Distribution System", and refers to the To DS and From DS bits. This can only be taken to mean that the To DS bit is ALWAYS set for ALL Data messages \ an ESS, even for STAs communicating within a single BSS. Use of the To DS bit requires transmission to the AP, as clause 7.2.2 states that "A station shall use the contents of Address 1 field to perform address matching for receive decisions". Always setting the To DS bit contradicts clause 9.3.3.2, which permits direct transmissions "to any station in the BSS". Annex C.4.2, state MD2 of the MAC Data Service State Machine explains the direct/To DS transmit decision, but leaves out the fact that a "hidden" station within the same BSS must also be accessed via	In the 2nd sentence of 5.7.1, after the words "handled by the Distribution Service" add the following text: ", unless the recipient station is known by the transmitting station to be a non-hidden, non-power-save station, in which case it is an option that the Data message be sent directly". In all 3 states of MD2 in annex C.4.2, the text: "non-hidden, " should be added in front of the texts: "non-power-save" and "non-power managed" wherever they occur.	Editorial / Consistency grouped with #35 **ACCEPTED** by making the text changes below, which are acceptable to the commenter REPLACE 5.7.1 with: "When a Station wishes to send data to another Station it sends a Data message. In an ESS the message shall be handled by the Distribution Service if the ToDS bit is set, otherwise the Data message is sent directly. In an IBSS, the Data message is sent directly."

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					the DS.		ALSO: remove reference to state machines in 9.1.5 (This is a consistency change which should have been made when the state machines were changed from normative to informative.) — — — — — — NOTE: A few members of the MAC group believe that all ESS data transfers should be handled by distribution service. To require this would constitute a major functional change, since DCF & PCF data frame transfer rules have allowed direct station-to-station (StS) transfers in ESS & IBSS environments ever since original adoption of the MAC foundation. This comment flags an inconsistency between the MAC behavior permitted in clauses 7 & 9, and the data transfer architecture described in clause 5. This comment does not ask that StS transfers in ESSes be prohibited. Both before and after this change, a STA can be fully conformant without attempting to initiate StS transfers while communicating as part of an infrastructure network.
35	5.7.1	rn	t	n	The text says that " In an ESS the message shall be handled by Distribution Service" which does not completely convey the Infrastructure BSS case. According to section 9.15 and Annex D of the MAC	Replace the text "In an ESS the message shall be handled by the Distribution Service." with "In an Infrastructure BSS the message shall	Editorial / Consistency grouped with #34 Adopting the proposed wording

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					data service state machine, the DATA message is sent directly to NON-power save station and to the distribution service in case of power save station.	be sent directly if the destination is a non-power save station, otherwise the message shall be handled by the Distribution Service."	would be a major (and undesirable) technical change that required the use of StS transfers in infrastructure networks. The same inconsistency is corrected in the resolution of comment #35, so this comment is DECLINED with agreement by commenter.
36	5.7.4	kba	t		Change "a" to "the" since there is only one broadcast address if IEEE 802 addressing is used.		Editorial ACCEPTED
37	5.7.5	jjk	e	n	clause numbers wrong	clause 117 clause 74	Editorial ACCEPTED
38	5.x	kba	e		Many clause references are off by 3 clauses.		Editorial ACCEPTED
39	6.	jz	T		Isn't Power Management a MAC Service? I think it should be in clause 6 somewhere.	<<I'll write text if you like>>	Editorial, grouped w/#11 In relation to MAC Data Service (the subject of clause 6) Power Management is type of MSDU delivery mechanism, which is not directly visible from the LLC interface. The exposed power managment service interface is part of MAC Management service, and the primitives are in clause 10. DECLINED
40	6.1.3	kba	t		With respect to the last sentence, can "reordering" assumptions be clarified further with an all 802 DS?		802.11 does not {cannot} guarantee strict ordering, even if the DS is another 802 network. The commenter has accepted this explanation. DECLINED, NO CHANGE
41	6.1.3	jz	t		Reordering is not a service! *Failing* to reorder things is a service. Change section heading to "MSDU Ordering", and reference clause 9.8 by adding this text:	Clause 9.8 specifies operational restrictions that ensure the appropriate ordering of MSDUs.	Editorial ACCEPTED
42	6.2.1.1	kba	t		MSDUs of up to 2304 octets and Frame Bodies of up		Required definition is clearly

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	& 7.1.2				to 2312 octets are mentioned without any definition of why the numbers are different.		stated in section 7.1.3.5 DECLINED, NO CHANGE
43	6.2.1.3	jz	e		Delete extra copy of last paragraph "The effect of receipt…" and fix the indentation of item h).		Editorial ACCEPTED
44	7,9	sab	e	n	The standard is inconsistent as to whether it is To(space)DS/From(space)DS or ToDS/FromDS. I thought I'd caught all of these in clause 7 - but it looks like I changed it the opposite way to the clause 9 team. Anyhow, it needs to be straightened out.	Editorial	EDITORIAL ACCEPTED
45	7.1.1	jz	t		The restriction that "The Individual/Group bit is always transferred first" imposes a wacky constraint on the PHY since the MAC/PHY interface is bytewise. I am not sure this is an appropriate restriction in clause 7.		Statement is not considered contradictory (MAC/PHY interface is not exposed), also 802-1990 clause 5 is very explicit on this matter). DECLINED, NO CHANGE
46	7.1.3.1.1	jz	e		Change "understands" to "supports" to sound better.		Editorial ACCEPTED
47	7.1.3.1. 5	sab	e	n	I think this should be … or current MMPDU now that we have a term for this item. A frame in the clause 7 text generally means a transmitted structure.	The More Fragments filed shall be one bit in length and shall be set to 1 in all frames which have another fragment of the current MSDU or ~~Management frame~~ MMPDU to follow. It shall be set to 0 in all other frames.	Editorial ACCEPTED (NB There are probably many other places in the standard where MSDU is used and MSDU/MMPDU is meant)
48	7.1.3.1.7	jz	t		Need to be precise with respect to when the PM bits will take effect. Also, 9.7 defines frame *exchange* sequences, not frame sequences.	The value shall indicate the mode in which the station shall be after the successful completion of the frame exchange sequence.	Editorial/Consistency ACCEPTED Brings text into line with 11.2.1.1
49	7.1.3.1. 7	AS	t	n	The power management bit indicates the current mode of the station not the future mode.	Original Text: A value of 1 shall indicate that the STA shall be in Power Save Mode. A value of 0 shall indicate that the STA shall be in Active Mode. This field shall always be set to 0 in frames transmitted by an AP. New Text:	Intent is for PM field to indicate status at end of a successful frame exchange sequence (ie in the future). This comment is an assertion, but is inconsistent with defined use of these bits and would require a technical change.

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						A value of 1 shall indicate that the STA shall be in Power Save Mode. A value of 0 shall indicate that the STA shall be in Active Mode. This field shall always be set to 0 in frames transmitted by an AP.	**HOWEVER, this comment does not actually request a change because the proposed new text is identical to the old text!** **DECLINED, NO CHANGE**
50	7.1.3.1.8	jz	t		The More Data field is used in group-addressed frames as well as directed frames. Also, this business about only being valid some of the time needs to be explicitly and precisely described!	The More Data field shall be valid only in Data Type frames transmitted by an AP to an STA in Power Save Mode, as well as broadcast/multicast frames transmitted by an AP, and shall be ignored by the receiver in all other cases.	**Editorial** **Changed text to clearly differentiate between directed and broadcast/multicast, capturing spirit of comment** **ACCEPTED**
51	7.1.3.1.8	jz	t		AP cannot know the future, and could conceivably send non strictly-ordered broadcast/multicast frames that arrive later during this beacon interval.	…by the AP when no more buffered broadcast/multicast MSDUs remain to be transmitted…	**Editorial** **handled as part of #50**
52	7.1.3.1.8	AS	t	n	**The more data bit in broadcast/multicast frames transmitted by an AP only announces further frames in the beacon interval if at least one station associated with the AP is Power Save Mode and the frame is not part of the Strictly-Ordered class.**	Original Text: The More Data field shall be set to "1" in broadcast/multicast frames transmitted by the AP, when additional broadcast/multicast MSDUs remain to be transmitted by the AP during this beacon interval. The More Data field shall be set to "0" in broadcast/multicast frames transmitted by the AP when no more broadcast/multicast MSDUs remain to be transmitted by the AP during this beacon interval. New Text: The More Data field shall be set to "0" in broadcast/multicast frames transmitted by the AP for frames with	**Editorial** **handled as part of #50**

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						the Order bit set. The More Data field shall be set to "0" in broadcast/multicast frames transmitted by the AP, when all stations associated with the AP are in the Active Mode. The More Data field shall be set to "1" in broadcast/multicast frames transmitted by the AP, when additional broadcast/multicast MSDUs remain to be transmitted by the AP during this beacon interval. The More Data field shall be set to "0" in broadcast/multicast frames transmitted by the AP when no more broadcast/multicast MSDUs remain to be transmitted by the AP during this beacon interval.	
53	7.1.3.2	jz	E		Do not ever use binary strings. The only conventions we have are for decimal values. It would be better to be more verbose and consistent than to be imprecise.	Change "set to '11'" to "both set to 1"	**Editorial** **Binary strings removed from entire clause** **ACCEPTED**
54	7.1.3.2	sab	e	n	**Second table row includes the term CF frames. Be careful with acronyms since CF is defined in the glossary as Coordination Function.**	**Change to 'Frames transmitted during the CFP that do not need an SID'**	**Editorial** **General clean up of table regarding references to CF frames and PS-Poll** **ACCEPTED**
55	7.1.3.2	jz	t		Item b) and the SID entry in the table contradict each other. I believe PS Polls are not supposed to be sent under the PCF, but it needs clarifying. If a STA wakes up during a CFP, it might not know that it is PCF time and might send a PS Poll. Is that illegal?		**Editorial** **ACCEPTED** **(see #54)**
56	7.1.3.3	AS	t	n	**In the Duration/ID table the encoding of SID is claimed to be used for PCF or DCF.**	Original text: SID in PS-Poll frames (under either	**Editorial** **ACCEPTED**

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					1. There are no PS-Poll frames in the PCF. 2. The PCF is a subset of the DCF.	PCF or DCF) New text: SID in PS-Poll frames	(see #54)
57	7.1.3.3. 2	AS	t	n	With the strictly-ordered class the broadcast address refers only to station of the same class. A station wishing to transmit a broadcast frame to all stations attached to the "medium" needs to transmit the frame twice, once to each service class. It is not clear what attached the communication medium means in this context. I think it should say part of the ESS.	Original Text: 2) Broadcast Address. A distinguished, predefined multicast address that always denotes the set of all stations on a given local area network. All 1's in the Destination Address field shall be predefined to be the Broadcast address. This group shall be predefined for each communication medium to consist of all stations actively connected to that medium; it shall be used to broadcast to all the active stations on that medium. All stations shall be able to recognize the Broadcast Address. It is not necessary that a station be capable of generating the broadcast address. New Text: 2) Broadcast Address. A distinguished, predefined multicast address that always denotes the set of all stations on a given local area network **of a particular service class**. All 1's in the Destination Address field shall be predefined to be the Broadcast address. **This group shall be predefined for each ESS to consist of all stations that are current members of the ESS; it shall be used to broadcast to all the stations in that ESS. All**	**DECLINED** 1) Service class is per–MSDU, not per–STA, so the requested behavior is inappropriate. 2) The broadcast address is defined in IEEE 802-1990 so we should not include our own definition here.

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						stations shall be able to recognize the Broadcast Address. It is not necessary that a station be capable of generating the broadcast address.	
58	7.1.3.4.1	AS	T	y	The sequence number in a broadcast/multicast frame does not provide any information and may make interoperability between stations and APs from different vendors impossible. The standard states that a station maintains a set of source address, sequence number tuples to perform duplicate detection. Due to the nature of multicast transmission from an AP after a DTIM, a broadcast frame could cause the source address, sequence number information associated with a directed transmission from the AP to be lost. This could result in either a frame being incorrectly rejected or a duplicate to be passed up to the LLC. The only way to avoid this is to ignore sequence numbers in broadcast/multicast frames. If sequence numbers are of no use in broadcast/multicast frames then fixing them to 0 greatly simplifies the algorithm for generating sequence numbers at the AP.	Original Text: The Sequence Number shall be a 12 bit field indicating the sequence number of an MSDU, or MMPDU. Each MSDU or MMPDU transmitted by a STA shall be assigned a sequence number. Sequence numbers shall be assigned from a single modulo 4096 counter, starting at 0 (zero) and incrementing by 1 (one) for each MSDU or MMPDU. Each fragment of a MSDU or MMPDU shall contain the assigned sequence number. The sequence number shall remain constant in all retransmissions of an MSDU, MMPDU or fragment thereof. New Text: The Sequence Number shall be a 12 bit field indicating the sequence number of an MSDU, or MMPDU. Each directed MSDU or directed MMPDU transmitted by a STA shall be assigned a sequence number. Sequence numbers shall be assigned from a single modulo 4096 counter, starting at 0 (zero) and incrementing by 1 (one) for each directed MSDU or directed MMPDU. Each fragment of a MSDU or MMPDU	PART OF A NO VOTE MAC Group Resolution: MAC group believes that there is no necessity for the requested change as is a simple design optimization rather than a fault in the protocol. Sequence numbers in multicast/broadcast frames can safely be ignored because the retry bit in those frames will never be set. MAC Group motion #10 MAC Vote 9-0-0 Confirmed by Plenary Motion #17 without dissent DECLINED This response was read to voter over the phone, he has agreed to change his NO vote to a YES if an editorial clarification is incorporated into clause 9.2.8. This has been done (comment #19 from 96/106-6, adopted in MAC motion #13)

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						shall contain the assigned sequence number. The sequence number shall remain constant in all retransmissions of an MSDU, MMPDU or fragment thereof.	
59	7.1.3.4	AS	t	n	**MMPDUs are not fragmented.**	Original Text: The Fragment Number shall be a 4 bit field indicating the number of each fragment of an MSDU or MMPDU. The Fragment Number shall be set to zero in the first or only fragment of an MSDU or MMPDU and shall be incremented by one for each successive fragment of that MSDU or MMPDU. New Text: The Fragment Number shall be a 4 bit field indicating the number of each fragment of an MSDU. The Fragment Number shall be set to zero in the first or only fragment of an MSDU and shall be incremented by one for each successive fragment of that MSDU. The Fragment Number shall be set to zero in an MMPDU.	**Editorial / clarification** **The preexisting behavior is not changed.** **MAC group believes that directed MMPDUs may be fragmented (eg Authentication frames containing the challenge text) and multicast MMPDUs may not (multicast frames are never fragmented).** **ACCEPTED** **by changing text to indicate directed MMPDUs may be fragmented, and that multicast MMPDUs may not**
60	7.1.3.6	jz	e		Please don't use the letter "x" for a multiplication sign ×. Especially in a polynomial, it is dangerously confusing!		**Editorial** **The IEEE editors requested us to use "x" for multiplication.** **DECLINED**
61					*COMMENT NUMBER 61 DOES NOT EXIST*		
62	7.2.1	sab	e	n	**B15 in the frame control field is still labeled Rsvd, should be 'order'**	**Bring diagram up to date**	**Editorial** **ACCEPTED**

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63	7.2.1	AS	e	n	**The figure shows the more data field as non-zero. The description of more data in 7.1.3.1.8 says that the more data field is only 1 for data frames from the AP to power save stations.**		**Editorial** **The clear intent of the standard is that More Data Field should always be 0 in Control Type Frames.** **ACCEPTED** **NOTE: There are probably other instances of inconsistency regarding the More Data bit, especially related to its use during the contention free period, but there was insufficient time to identify or correct them.**
64	7.2.1.4	jz	E		Do not ever use binary strings. The only conventions we have are for decimal values. It would be better to be more verbose and consistent than to be imprecise.	Change "set to '11'" to "both set to 1"	**Editorial** **ACCEPTED**
65	7.2.2	jz	E		We don't have a convention for binary strings in the first place, and the notation "01xx" is not defined. Be explicit that we are talking about binary strings, and enumerate all four possibilities.	Change "01xx" to "whose binary representation in table 1 is 0100, 0101, 0110 or 0111". Similar changes for "00xx" in the middle of the clause	**Editorial** **ACCEPTED** **but subtypes enumerated to be consistent with rest of clause**
66	7.2.2	AS	t	n	**Multicast data frames are not fragmented**	Original Text: If the More Fragments bit is set to 0 in the Frame Control field of a frame and the Address 1 field contains an individual address, the Duration value shall be set to the time, in microseconds, required to transmit one ACK frame, plus one SIFS interval. If the More Fragments bit is set to 0 in the Frame Control field of this frame and the Address 1 field contains a group address, the Duration value shall be set	**Editorial** **This is an artifact left from incomplete application of last meeting's adopted changes.** **ACCEPTED** **changed to bring into line with remainder of standard**

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						to 0. If the More Fragments bit is set to 1 in the Frame Control field of a frame, and the Address 1 field contains an individual address, the Duration value shall be the time, in microseconds, required to transmit the next fragment of this Data frame, plus two ACK frames, plus three SIFS intervals. If the More Fragments bit is set to 1 in the Frame Control field of the frame, and the Address 1 field contains a group address, the Duration value shall be the time, in microseconds, required to transmit the next fragment of this Data frame, plus one SIFS interval. New Text: If the Address 1 field contains a group address, the Duration value shall be set to 0. If the More Fragments bit is set to 0 in the Frame Control field of a frame and the Address 1 field contains an individual address, the Duration value shall be set to the time, in microseconds, required to transmit one ACK frame, plus one SIFS interval. If the More Fragments bit is set to 1 in the Frame Control field of a frame, and the Address 1 field contains an individual address, the Duration value	

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						shall be the time, in microseconds, required to transmit the next fragment of this Data frame, plus two ACK frames, plus three SIFS intervals.	
67	7.2.3	AS	e	n	**Management frames are no longer fragmented.**	Original Text: Within all Management Type frames sent during the contention period the Duration field shall be set according to the following rules: If the More Fragments bit is set to 0 in the Frame Control field of a frame and the DA contains an individual address, the Duration value shall be set to the time, in microseconds, required to transmit one ACK frame, plus one SIFS interval. If the More Fragments bit is set to 0 in the Frame Control field of a frame and the DA contains a group address, the Duration value shall be set to 0. If the More Fragments bit is set to 1 in the Frame Control field of a frame, and the DA contains an individual address, the Duration value shall be the time, in microseconds, required to transmit the next fragment of this Management frame, plus two ACK frames, plus three SIFS intervals. If the More Fragments bit is set	**Editorial / clarification** **The preexisting behavior is not changed.** **MAC group believes that directed MMPDUs may be fragmented (eg Authentication frames containing the challenge text) and multicast MMPDUs may not (multicast frames are never fragmented).** **ACCEPTED** **by changing text to indicate directed MMPDUs may be fragmented, and that multicast MMPDUs may not**

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						to 1 in the Frame Control field of a frame, and the DA field contains a group address, the Duration value shall be the time, in microseconds, required to transmit the next fragment of this Management frame, plus one SIFS interval. New Text: Within all Management Type frames sent during the contention period the Duration field shall be set according to the following rules: If the DA contains a group address, the Duration value shall be set to 0 The Duration field shall be set to the time, in microseconds, required to transmit one ACK frame, plus one SIFS interval.	
68	7.2.3.1	sab	E	n	Be careful of the use 'mandatory' in describing optional information elements. This defines clearly when it is required but not where it is not. Make this absolutely clear.	Use wording such as: The FH Parameter Set information element shall only be present within Beacon Frames generated by STAs using Frequency Hopping Physical layers. Same for other Notes	Editorial / Clarification ACCEPTED also corrected probe response in 7.2.3.9
69	7.2.3.1, 7.2.3.9 also 11.1.2.1 and	mif	t	n	The time to next TBTT field should be restored to Beacon and Probe Response frames — this both improves the efficiency of passive scanning (as measured by required power consumption at the station) and reduces the processing overhead for	Restore the fields as defined in D3.1. Add a sentence to 11.1.2.1. and 11.1.2.2 stating that the sender of the Beacon frame shall include a value that is a number of Kmicroseconds	Technical Requests new functionality which may be useful, but is not critical to operation of the protocol and which has been

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	11.1.2.2 and 11.1.3.2 .1				**active scanning. This also provides a much simpler means of a station listening for other APs while still associated, to possibly select a better AP for reassociation, without extra overhead to obtain synchronization when reassociation is attempted.**	**equal to or one less than the time from the time of sending this Beacon frame until the next TBTT. A similar sentence should be added to 11.1.3.2.1 for inclusion of this field in the probe response frame.**	**rejected at least once before. DECLINED**
70	7.2.3.10	jz	t		I think we should allow more than one Challenge Text element to be present in case some future algorithm needs more than 255 bytes worth of text.	Change Note 2 to explain this.	**Editorial** This principle was agreed upon at the last meeting. This is why challenge text takes the element ID value 16 — the 4 lower order bits can be used as a challenge text sequence number. **ACCEPTED** Added explicit statement that element ID's 17-31 are reserved for chalenge text extension.
71	7.2.3.9	jz	e		Change "Ad Hoc" to "IBSS" in note 3. And put hanging indents onto those paragraphs.		**Editorial ACCEPTED**
72	7.3.1.1	jz	t		There never has been and never will be a reason to have more than 255 authentication algorithms or steps in an authentication procedure. Make the Authentication Algorithm Number and Authentication Transaction Sequence Number both a single octet. Since they always appear together, it preserves the even-alignment of the frame.		**Technical** Fixed fields are always even octet aligned. This would be a technical change and may cause problems in confirmation ballot. The extra overhead is only in authentication frames. Best to leave alone considering the discussion on this subject in the past **DECLINED**
73	7.3.1.3	jz	t		The beacon interval is defined as the time between TBTTs, not Beacon generations, since they may be delayed.	Change "Beacon generations" to "TBTTs (see clause 11.1.2.2)".	**Editorial ACCEPTED**
74	7.3.1.4	th	e		**The paragraph starting "0An STA that is" has an extra leading character.**	**Change the first sentence to begin: "An STA that is".**	**Editorial ACCEPTED**

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75	7.3.1.4	sab	e	n	Remove spurious 0 at the start of the fifth paragraph	0An STA that is CF-Pollable ...	Editorial ACCEPTED
76	7.3.1.4	mif	t	n	There should be a capability bit in frames sent by an AP that contain a capability information field to indicate that the AP is using WEP with Exclude Unencrypted=TRUE. This avoids the situation where a station associates with such an AP, the has all of its frames discarded, without indication, due to its not using WEP. This is not a strict interoperability problem, but with a plurality of reserved capability information bits available, there seems to be no reason to waste time of the wireless medium for frames which are guaranteed to be discarded, even when received without error.	Define capabilitiy bit 4 to meand Excluding Unencrypted, withe the definition that "APs shall set the Execluding Unencrypted subfield to 1 within transmitted Beacon or Probe Response Management frames when operating with aExcludeUnencrypted=True." A further refinement would be to allow STA to set this bit in probe requests to seek responses only from APs using WEP, but this is of limited value, and does not relate to the risk of transmitting unusable frames.	May be Technical This is a request for a minor technical improvement, the inclusion of which is unjustifiable at this late date. The MAC group is willing to accept the slight (and, presumably, limited-duration) efficiency loss in the cases where the lack of this feature matters. DECLINED NOTE: Commenter believes this is not a technical change under Geoff Thompson's definition, as an implementation of D4.0 in a BSS with stations that set/interpret this bit would be no less interoperable than in a BSS of pure D4.0 stations.
77	7.3.1.6	th	e		The "Reason Code" heading for the next section has been pulled into the previous "Listen Interval" section.	"Reason Code" should be 7.3.1.7, next sections will move down.	Editorial ACCEPTED
78	7.3.1.6	jjk	e	n	sections run together. STA.Reason Code run together. Reason Code is a new sub-section	add new subsection after ...that it buffers foan an STA.	Same as comment #77 Editorial ACCEPTED
79	7.3.1.6	mif	E	n	There seems to be a section heading missing for "Reason Code", with the definition of the reason codes beginning as the 3rd paragraph of "Listen Interval"	Add heading, ensure that the section references in the PICS remain consistent	Same as comment #77 Editorial ACCEPTED
80	7.3.1.6	jz	t		An AP can only support a finite number of stations in Power Save mode, since they take buffer resources. If a STA requests to go into PS Mode and the AP can't handle it, the only thing I can see happening is for the AP	Add a reason code "Disassociated because AP cannot support additional Power Save stations".	Discussed at great length, but in the end decided to leave alone. Group believes that reason code #5 (cannot support all currently

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					to disassociate the STA at that time.		associated stations) can be used for the indicated purpose since the problem is likely to be due to a shortage of buffer space in the AP. **DECLINED**
81	7.3.1.6 (7)	sab	E	n	**Reason Code title is normal text. Section has no number (and following section numbering is thus out)**	**Reformat**	**Editorial ACCEPTED**
82	7.3.1.7	jz	E		Do not ever use binary strings. The only conventions we have are for decimal values. It would be better to be more verbose and consistent than to be imprecise.	Change "set to '11'" to "both set to 1"	**Editorial ACCEPTED**
83	7.3.1.7	sab	t	n	**SIDs up to 2007 can be accommodated within the TIM. Therefore refrain from assigning SIDs above 2007. The current max value here is 16383 which is inconsistent with clauses 7.1.3.2 and 7.3.2.1**	**The value assigned as the Station ID shall be in the range 1 - 2007 ~~16383~~ and shall ….**	**Editorial Consistency required with 7.1.3.2 ACCEPTED**
84	7.3.1.7	AS	t	n	**The range of SID is 1-2007 not 1-16383**	Original Text: The value assigned as the Station ID shall be in the range 1 - 16383 and shall be placed in the least-significant 14 bits of the SID field, with the 2 most-significant bits of the SID field set to 11 (see 7.1.3.2). New Text: The value assigned as the Station ID shall be in the range 1 - 2007 and shall be placed in the least-significant 14 bits of the SID field, with the 2 most-significant bits of the SID field set to 11 (see 7.1.3.2).	**Editorial Consistency required with 7.1.3.2 ACCEPTED**
85	7.3.1.8	jz	t		An AP can only support a finite number of stations in Power Save mode, since they take buffer resources. If a STA requests to be in PS Mode when it associates and the AP can't handle it, the only thing I can see happening is for the AP to deny the association.	Add a status code "Association denied because AP cannot support additional Power Save stations"	**See discussion for comment #80 Also, the AP cannot determine whether a STA wants to enter PS mode at association time (or may ever choose to enter later in**

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							its association) except in cases where the STA sets PM field in the association frame sequence. **DECLINED**
86	7.3.2	sab	e	n	**The order in which element descriptions appear is somewhat random - reorder either in Alphabetical order or (preferably) in the order that they are assigned IDs**	**Reformat**	**Editorial** Not changed due to risk of introducing new cross-reference and PICS errors. **DECLINED**
87	7.3.2.1	jz	t		The sixth paragraph contradicts 11.2.1.5, since a PC may not set all the bits for stations that have buffered traffic. Also, need to use "shall" in normative text.	Each bit in the traffic-indication virtual bitmap shall correspond to traffic buffered for a specific station within the BSS that the AP is prepared to deliver at the time the beacon or probe response frame is transmitted. ~~If bit~~ Bit number N ~~is~~ shall be 0, if there are no directed frames buffered for the station whose Station ID is N. If any directed frames for that station are buffered, and the AP is prepared to deliver them, bit number N in the traffic-indication virtual bitmap ~~is~~ shall be 1. A PC may decline to set bits in the TIM for stations is does not intend to poll (see clause 11.2.1.5).	**Editorial / Consistency** Text changed as shown below: Each bit in the traffic-indication virtual bitmap shall correspond to traffic buffered for a specific station within the BSS that the AP is prepared to deliver at the time the beacon or probe response frame is transmitted. ~~If bit~~ Bit number N ~~is~~ shall be 0, if there are no directed frames buffered for the station whose Station ID is N. If any directed frames for that station are buffered, and the AP is prepared to deliver them, bit number N in the traffic-indication virtual bitmap ~~is~~ shall be 1. A PC may decline to set bits in the TIM for CF-Pollable stations it does not intend to poll (see clause 11.2.1.5) **Also changed:** in 11.2.5.1. (c) delete the words "CF-Pollable" **ACCEPTED**
88	7.3.2.5	sab	E	n	**Diagram here has k microseconds, text has K microseconds. Latter is intended. Modify Diagram**	**Modify Diagram**	**Editorial** **ACCEPTED**
89	7.3.2.7	jz	t		I think we need to allow for multiple Challenge Text		**Editorial, see comment #70**

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					elements to be present, in case an algorithm needs more than 253 octets worth of text, or wants to deal with more than one key at a time or something. Add a note to this effect here and in 7.2.3.10.		**This principle was agreed upon at the last meeting. This is why challenge text takes the element ID value 16 — the 4 lower order bits can be used as a challenge text sequence number.** **ACCEPTED** **Added explicit statement that element ID's 17-31 are reserved for chalenge text extension.**
90	8.1.1.2	jz	t		A STA should always implement *some* kind of authentication algorithm. I think we should require OSA of systems that don't implement SKA. Add this to the end of the section:	The result field shall be "unsuccessful" only if the transmitter of the response implements some other authentication algorithm.	**Editorial / Consistency** **Text modified in 8.1.1. The requested behavior is already implicit from the default values specified in 11.4.4.1.9 and 11.4.4.1.11** **ACCEPTED**
91	8.1.2	th	e		**last paragraph, 2nd sentence:** **The acronym "PRN" has not been defined at this time. Also, the wording "This facilitates finding the PRN" is not strong condemnation.**	**Change the words "PRN sequence" to: "PRN (pseudo random number) sequence.** **Change the beginning of the sentence to: "This facilitates unauthorized discovery of the PRN".** **Also, capitalize the first word of the next sentence: "Implementations".**	**Editorial** **ACCEPTED**
92	8.1.2	jz	t		Should the end of the first paragraph be like it is, or does it mean that SKA shall be *active* if WEP is *active*? I guess I can imagine having WEP active while using OSA, though it does not make a lot of sense.		**Editorial / Clarification** **The meaning is that SKA shall be available, but not necessarily active, in any STA where the WEP option is implemented. The sentence was changed to clarify this meaning.** **ACCEPTED**
93	8.1.2.4	th	e		**The Information Item labeled "Authentication Algorithm Identification" is written as "shard key"**	**It should be written as "shared key"**	**Editorial** **ACCEPTED**
94	8.2.3	jz	t		Describe the bit-order of the IV field. It should probably	<<I'll rewrite it during the meeting if	Editorial

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					be LSB first (is LSB defined in clause 4?). I say rewrite the paragraph beginning with "For WEP protected frames" so it just references, rather than contradicts, clause 8.2.5. Also, the term "key" is used where "seed" should be used.	people agree with my assertion>>	ACCEPTED the item pertaining to IV field details by replacing obsolete discription with a reference to 8.2.5. DECLINED the item pertaining to "key" because the wording appears to be appropriate.
95	8.2.3	jz	T		The phrase "IV may be changed as frequently as every MPDU" implies that it need not. The only reason for not changing it is to improve efficiency. This is covered under U.S. Patents 5,345,508 and 5,444,781. Would it be prudent to point that out to the reader?		Not changing the IV only improves efficiency for some implementations, and may actually reduce efficiency in other cases. The cited patents describe an implementation approach which *could* be used for 802.11 WEP, but is only one of many possible approaches. DECLINED
96	8.2.3	jz	t		There are two occurrences of "is" in the last paragraph that ought to be "shall be" in normative text.	I'll let you figure out which two are OK and which two are not. ;-)	Editorial ACCEPTED
97	8.2.5	jz	t		Specify the bit-order for the IV field. And rephrase the last sentence of the first paragraph with "shall occupy".		Editorial Clarified IV field bit order by adding a reference to 7.1.1 (which is the global definition of bit ordering in 802.11 fields). ACCEPTED
98	8.3.2	jz	t		I think "externally read-only" should be "externally write-only".		Editorial / Consistency "Externally read-only" was an editing error when this text was originally included. Annex D was already correct, and a corresponding consistency change has been made to 11.4.2.1.1. ACCEPTED
99	8.3.2	jz	t		The default value for aWEPDefault should either be -1 or 256, to allow for a future expansion of the key number to more bits.		See also 96/106-4, comment #25 The requested change is declised

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							as (marginally) technical, but the commenter's stated objective has been achieved due to an editorial/consistency change: The default value was changed to 0 in clauses 8.3.2 and 11.4.4.1.14 to be consistent with the aWEPDefault value specified in Annex D. ACCEPTED in spirit, but with different, editorial change.
100	8.3.2	jz	T		The "Transmit case:" and "Receive case:" descriptions are both totally screwed up and inconsistent with the new way we use aWEPDefault and aDefaultWEPKey. And the receive case doesn't mention the WEP control bit.	<<I'll rephrase during the meeting if nobody else wants to have a crack at it>>	Editorial / consistency Editing artifacts removed and this portion of 8.3.2 updated to be consistent with Annex D and other parts of clause 8 as part of same consistency change mentioned with comment #99. ACCEPTED
101	9.1.2	jz	t		The members of a point-coordinated BSS won't even attempt to gain access to the medium out of turn (their NAVs are set), so using PIFS to give the AP priority is wacky. It really is only to allow the AP to grab the medium away from *another* overlapping BSS.	Add text to that effect.	Editorial / Clarification Text change in section 9.1.2 without changing the meaning. ACCEPTED
102	9.2	jz	t		The fifth paragraph is incorrect as it now reads.	, which is through the end of the ACK that is expected at the end of the next transmission in the frame exchange sequence.	Editorial / Clarification ACCEPTED New text carefully reviewed by MAC group to ensure no change of meaning
103	9.2.1	jz	t		I don't like the sentence "the opposite of a busy medium shall be known as a free medium." It is patronizing.	Delete sentence or rephrase it so it has some nontrivial intellectual content	Editorial ACCEPTED Sentence merged with previous sentence
104	9.2.3.1	jz	t		A station can't "cause SIFS to vary" as in the second	Change "cause SIFS to vary from its	Editorial ACCEPTED

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					paragraph. SIFS is a constant It can allow the gap between successive frames to diverge from a SIFS by a certain amount.	nominal" to "allow the space between frames that are defined to be separated by a SIFS time, as measured on the medium, to vary from the nominal SIFS""	
105	9.2.3.2	jz	t		The PCF is a function. It allows certain STAs to access the medium. It does not itself access the medium. Rephrase section to evince appreciation of the difference between the function and the STA operating under the function.		Editorial ACCEPTED (Change also made to 9.2.3.3 (DCF))
106	9.2.3.4	jz	T		The EIFS mechanism is basically an assumption that the medium is busy for a certain amount of time after an unintelligible reception, regardless of what is on the medium. Need to clarify how this relates to NAV. Add:	NAV shall not be decremented during an EIFS interval regardless of the state of the physical carrier sense mechanism.	Editorial / Clarification ACCEPTED
107	9.2.4	th	e		**Figure 39 has obvious problems with numbers being partially hidden.**		Editorial FIGURE FIXED
108	9.2.4	jz	e		The numbers in the picture are both illegible and nonsensical. Should start at 31 and go up to 1023		same issue as comment #107 FIGURE FIXED (Numerical values are clearly stated as being an example in the figure caption, so the values have not been changed)
109	9.2.4	sab	e	n	**Numbering in Figure 39 is probably unnecessary**	**Remove, or replace with aCWmin, 2aCWmin up to aCWmax**	same issue as comment #107 FIGURE FIXED (Numerical values are clearly stated as being an example in the figure caption, so the values have not been changed)
110	9.2.4	db	t	n	Clause 9.2.4 figure 40 - editors note says figure is wrong due to editing limitation. Correct figure - I view correction of figure to match previous decisions as editorial in nature though the problem is technical.		same issue as comment #107 FIGURE FIXED (Numerical values are clearly stated as being an example in the figure caption, so the values have not been changed)
111	9.2.4 14.8 15.3.4	rn	t	n	**The text says .....and continuing upto and include a static PHY-specific aCWmax value"**		Much debate on this and associated consistency throughout draft.

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	16.4				aCWmax value is not defined in any of the PHY sections. If it is PhY specific, it needs to be defined in the PHY sections 14.8,15.3.4, and 16.4 else delete that its is PHY specific.		**Motion:** Although this is an improvement in principle, we decline comment 111 in the interests of minimizing changes and maximizing the chance of a successful confirmation ballot **Moved: Wim Diepstraten** **Second: Chris Zegelin** **Plenary Motion #9: 10, 6, 5** **Motion Fails** **Motion:** Replace the word static with fixed with respect to CWmin in clause 9.2.4. Define aCWmin, aCWmax in each PHY MIB (DS, FH, IR) aCWmin : FH=15, DS=31, IR=63 aCWmax : FH=DS=IR = 1023 Make new PHY MIB objects <u>Get only</u> to reflect the fact that they have been moved from MAC (where they needed to be set by the MAC according to the PHY type) to the PHY (where they are fixed based on decision at last meeting). **Moved : Simon Black** **Second: Michael Fischer** **Plenary Motion #10 : 13, 1, 10** **Motion Passes** (Note also issue/comment in

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							clause 11)
112	9.2.4	mif	t	n	The Random() function needs to be slightly more rigorously defined to produce a fair CSMA mechanism. In particular, if Random() yields a pseudo–random number between 0 and 1, there should be a provision that the fractional precision be at least equal to 1/CWmax (so that the random number has the possibility of selecting any slot in the contention window). Furthermore, the random numbers should be from a UNIFORM distribution, which is the typical, but not the only, interpretation of the term "random" in probability.	Add text to the definition of Random() to state: "Pseudo random number between 0 and 1. This pseudo random number shall have sufficient fractional precision to represent not less than aCWmax discrete values, drawn from a uniform distribution over the half–open interval (0,1]."	Editorial / Clarification ACCEPTED Definition added, but with half-open interval reversed so that a backoff duration of 0 is possible. Comment author agrees that the desired behavior occurs when this interval is reversed to [0,1).
113	9.2.5	AS	t	n	The contention window (CW) should be reset after a successful transfer or the frame is discarded due to the retry count reaching the RetryLimit. It makes no sense to penalize a new transmission to possibly a different destination.	Original Text: The CW shall be reset to aCWmin after every successful attempt to transmit an MSDU or MMPDU. New Text: The CW shall be reset to aCWmin after every successful attempt to transmit an MSDU or MMPDU. The CW shall also be reset to aCWmin when either of the retry counters equals the associated retry limit.	Suggested modification does not help if retries are due to a busy medium. This was discussed at length during the May, 1996 meeting, leading to the conclusion was that this behavior was not desirable. DECLINED
114	9.2.5.1 9.1.4	th	t		No mention is made in 9.2.5.1 ("Basic Access") that an STA may not transmit a pending MPDU if there is not time before a dwell time boundary for an FH PHY. All discussion of this limitation is in reference to "fragments" (clauses 9.2.5.5 and 9.4). This limitation also applies to non-fragmented MSDUs (those transmitted in a single MPDU). The MAC Control State Machine, Transmission Control (C7) does make this clear, but the text never supports this limitation, as it must. It is my understanding that the term "fragment" was to also apply to the non-fragmented MSDU transmitted in a single MPDU. However, given that in 9.1.4 it is stated: "Fragmentation creates	9.2.5.1 should be modified to add a sentence at the end of the 2nd paragraph: "An STA using a FH PHY shall not initiate transmission of a pending MPDU if there is not time before the dwell time boundary for it to receive the ACK for that MPDU." An alternative is to change 9.1.4 to specify that the term "fragment" can also apply to a non-fragmented MSDU transmitted in a single MPDU. I feel this is more awkward.	Editorial Moved text from fragmentation clause to basic access clause (9.2.5.1). Tidied text to account for broadcast/multicast and substituted MPDU for fragment. ACCEPTED

Seq. #	Section number	your initials	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Corrected Text	Disposition/Rebuttal
					MPDUs smaller than MSDU size", a fragment CANNOT refer to a non-fragmented MSDU transmitted in a single MPDU. Nothing in 9.1.4, which defines fragmentation, implies that a fragment is anything other than a part of an MSDU contained in an MPDU. This seems to be a direct contradiction of the expanded use of the term "fragment" to include an entire MSDU contained in a single MPDU. Therefore text referring to ensuring adequate time before an FH PHY dwell time boundary must be made more general than the current references to fragments only.		
115	9.2.5.2	jz	t		Clarify what "winning" means in sixth paragraph, and that the other stations that "lose" have decremented their counters and will thus be more likely to "win" next time.		**Editing group concluded existing text was clear and accurate, so no change is needed.** **DECLINED**
116	9.2.5.4	jz	t		First sentence is wrong. The beginning of a CFP sets the NAV to a non-zero value ("duration" is the wrong word).	Change "the event" to "an event" and "frames" to "any frame"	**Editorial** **Comments relate to a sentence that is strictly redundant. Sentence deleted so spirit of comment accepted.** **ACCEPTED**
117	9.2.5.4	jz	T		The third paragraph allows a station to reset its NAV to zero; it should go back to what it was before the RTS was received! Consider the case of two other stations that are out of range of each other. If you get some duration value from an ACK (say), then a duration that stretches out to a little longer than that from an RTS, you still need to defer to the traffic that generated the ACK.	<<I can rephrase the paragraph if nobody else feels like it.>>	**Group believes current text is correct (ie NAV should be zeroed). One good reason is the desire not to buffer old NAV values !** **DECLINED**
118	9.2.5.5	sab	e	n	**Bullets at the end of this section are incorrectly formatted. Third bullet should return to Normal style to begin a new bullet list**	**Reformat**	**Editorial** **FIXED FORMATING**
119	9.2.5.5	jz	t		An impending TBTT in another cause that can make a STA give up in the middle of an otherwise successful	Rephrase second sentence to cover all the cases.	**An STA should complete the frame exchange sequence**

Seq. #	Section number	your ini-tials	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Corrected Text	Disposition/Rebuttal
					MPDU burst. There may be other ones as well…		(fragment burst) underway (even) if a TBTT occurs. **DECLINED, NO CHANGE**
120	9.2.5.5	jz	t		The paragraph about having to re-contend at the beginning of the next dwell time needs a correlate for what to do when you get interrupted by a CFP or TBTT.		related to comment #119 **DECLINED**
121	9.2.5.5	AS	t	n	**The current bullet list doesn't make sense**	Original Text: The following rules shall also apply.When a station has transmitted a frame other than an initial or intermediate fragment, that station shall not transmit on the channel following the acknowledgment for that frame, without performing the backoff procedure. New Text: The following rules shall also apply. • When a station has transmitted a frame other than an initial or intermediate fragment, that station shall not transmit on the channel following the acknowledgment for that frame, without performing the backoff procedure.	**Editorial FIXED FORMATING**
122	9.2.5.6	jz	t		The last sentence of the second paragraph makes it sound like you don't need to do any RTS/CTS at all.	therefore no further RTS/CTS frames need to be generated after the RTS/CTS that began the frame exchange sequence even though	**Editorial / Clarification ACCEPTED**
123	9.2.5.7	sab	e	n	**Directed MPDU Transfer Procedure title has become**	**Reformat (will cause section**	**Editorial**

Seq. #	Section number	your ini-tials	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Corrected Text	Disposition/Rebuttal
					'Normal' text	renumbering)	ACCEPTED
124	9.2.5.7	jz	t		The second paragraph makes it sound like you should ignore any other frames and go right to the backoff procedure. The STA should process any correctly received frames as usual, and go do the transmit backoff thing after that.		**Editorial / Clarification** **Text added to state that frame processing is optional (standard was mute).** **ACCEPTED**
125	9.2.7	jz	t		Why is aACKTimeout a MIB variable? It's just SIFS plus the processing delay now, since we defined it as when the ACK should have *started* rather than finished. We also need to clarify that STA should respond to any other correctly received frame it gets while expecting an ACK as usual, not ignore it and run back to the backoff procedure.		**OK this MIB object is not the most useful ! Too much editing to remove at this stage.** **The second part of this comment is related to #124 and is fixed with the same text change.** **DECLINE PART 1** **ACCEPT PART 2**
126	9.2.8	jz	T		The use of "source-address" here is wrong. It should be the Address 2 (immediate transmitter's address), shouldn't it? And change "rejected" to "discarded" in the last sentence.		**Editorial / Consistency** **(This is an editing artifact from before the frame format changes that specified the Address2 field as the immediate sender's address at the November, 1994 plenary meeting.)** **replace SA with Address 2 here, as well as in several other places (see also comment #140)** **ACCEPTED**
127	9.2.9	jz	e		Please don't use the letter "x" for a multiplication sign ×.		**Editorial** **DECLINED** **because 'x' was reqested by the IEEE editors**
128	9.2.9	sab	e	n	**The last sentence says: 'The tolerances are specified in the PHY MIB and shall only apply to the SIFS specification so that tolerances shall not accumulate'.** **Tolerance on SIFS is now specified in 9.2.3.1 (SIFS) not in the PHY MIB** **Underscores need to be removed from this diagram's**	**Amend reference** **Amend text on diagram**	**This is felt to be unnecessary duplication** **DECLINED**

Seq. #	Section number	your ini-tials	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Corrected Text	Disposition/Rebuttal
					text		
129	9.2.9	vh	e	no	Inconsistent use of units	Replace Mbps by Mbit/s on the middel of page 85	Editorial ACCEPTED
130	9.2.9	jz	t		Does aACKSize include the PLCP overhead? It is multiplied by 8 to get the length of time an ACK takes at one Mbps in a couple of different places. Either need to fix definition in the MIB or add the PLCP junk into the formula.		Editorial / Clarification Changed the text to reflect the PLCP overhead ACCEPTED
131	9.2.9	jz	t		Reiterate the +/- 10% restriction on SIFS accuracy.		DECLINED this is already in PHY section.
132	9.2.9 14.3.3.2 .1, 14.6.15. 3 15.4.8.4	sab	t	n	Sure Slot Time is a PHY dependent parameter since the minimum value is directly related to CCA assessment time and RxTx turnaround time. However, the absolute timing of slot boundaries is related to MAC timing (see 9.2.9). In fact 14.3.3.2.1 is ambiguous as to the reference point for slot timing (MAC or antenna). My guess is that you mean MAC referenced slot timing - the 22us after the start of a slot referring to the RxTx Air and RF propagation delays. If this is so then say this. In fact, will the indication to the MAC at the slot boundary not be a little late since the MAC needs to make a decision aMACPrcDelay (M2 in 9.2.9) before the end of the slot boundary. Indeed, the default values in 14.8.2 do not seem to add to the slot time according to clause 9.2.9: SlotTime = RxTx (20) + AirProp (1) + CCAssmnt (29) + MACPrcDelay (2) = 52 ! I really wonder how an implementation is going to be tested for compliance to these CCA rules. Why is this not simply stated as a maximum CCA assessment time - ie signal at antenna to CCA indication - rather than something referenced to timing points not in this sub-layer? This would get rid of all this slot time referencing and asynch/synch specification. This would surely make testing compliance easier. I'm	Cross check MAC and PHY CCA texts and diagrams for a consistent story in the sections indicated. Watch reference points. I know how this works but I'm not so sure that everything in the document knits together for the unwary ... or the conformance test specification!	Editorial ACCEPTED MAC group to fix identified problems with figure in 9.2.9 PHY groups dealing with reference points, etc separately.

Seq. #	Section number	your ini-tials	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Corrected Text	Disposition/Rebuttal
					going to be interested to see the procedures for checking the probabilities for FH here too ! I'm also not sure about 9.2.9 now since CCAdel in the PHY definition includes RxRFDelay and RxPLCPDelay (14.8.2.1.5) yet in the diagram here this is part of D2 - D2 should just be air propagation time, not D1 plus air prop time. The DS folks have a similar thing in 15.4.8.4. Again here it is ambiguous where the slot timing reference point is (with the wording here it is also ambiguous whether this means 5us from the start (correct) or end (wrong) of the slot since it simply says 'from a slot boundary'.		
133	9.3	jz	t		The concept of polling list is introduced in fits and starts throughout the section, and it took me about five readings of the document to figure out what the Hell it is. Please define the concept in the first part of the section. It needs to be clear the difference between the set of stations that are eligible to be polled and the list of stations that will be polled in some order at a particular time. Perhaps the baseball term "lineup" would be better.		**Editorial** **DECLINED the comment since no text was provided**
134	9.3.1	jz	t		The third paragraph places an incorrect restriction on what frames can have CF parameter sets in them. There are several places where "beacon" is used instead of "beacon and probe response".	shall only be present in Beacon <u>and Probe Response</u> frames	**Editorial** **ACCEPTED**
135	9.3.2.2	jz	t		It is unclear to me whether a probe response can be generated during a CFP, but if it can the second paragraph should include that in the set of things that cause you to update your NAV.		**Editorial / Clarification** **New text provided to clarify the authors comment** **ACCEPTED**
136	9.3.3.1	jjk	t	y	it must be made clear that Non-CF-Pollable stations that receive a data frame during the PCF do not reset their NAVs either, just as in the case of CF-Pollable	A CF-Pollable station that receives a directed frame with any of data subtypes that include CF-Poll may transmit one data frame a SIFS period after receiving the CF-Poll. CF-Pollable stations shall ignore, but not reset, their	PART OF A NO VOTE MAC Motion #4: That we **ACCEPT** comment 136 on clause 9, suggest text from Joe Kubler from technical no vote, but place

Seq. #	Section number	your ini-tials	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Corrected Text	Disposition/Rebuttal
						NAV when performing transmissions in response to a CF-Poll. <u>Non-CF-Pollable stations that receive a directed frame with any of data subtypes shall transmit a DCF ACK, but shall not reset their NAV.</u>	the text in a separate paragraph after the paragraph indicated in the comment (since the referenced paragraph refers to CF-Pollable stations). **This change, however, is a clarification, not a technical change to the standard.** Change is not technical because in 9.2.5.4 it is stated that the NAV is updated only when the new duration is greater than the existing duration. In 9.3.2.2 the only conditions which may reset the NAV are CF-End or CF-End+ACK. Moved: Jon Rosdahl Seconded: Bob O'Hara MAC Vote: 9, 0, 0 Confirmed by Plenary Motion 18: Moved: MAC Group Seconded: Jon Rosdahl Approved by voice vote without dissent This changed text was FAXed to Joe. He accepts this resolution and has FAXed a reply confirming the change of his NO vote to YES.
137	9.3.3.3 9.3.3.5	th	t		It is unclear what a PC using an FH PHY must do as the dwell time boundary approaches. Clause 9.3.3.3 implies that it will relinguish the medium at the dwell time boundary by sensing for a free medium for a DIFS time, but "every aMediumOccupancyLimit Kµs during the CFP" is not defined as being synchronized with the dwell time boundary, even though it is equal	In clause 9.3.3.3, 2nd paragraph, the text reading: "For operation of the PCF in conjunction with an FH PHY, aMediumOccupancyLimit shall be set equal to the dwell time" should have the following text added: ", with the sensing of the free	**Editorial / Clarification** This is the equivalent PCF issue to #114 on DCF transfers near a dwell boundary, and has been clarified in a similar manner, as part of the PCF transer rules. This was also clarified by

Seq. #	Section number	your ini-tials	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Corrected Text	Disposition/Rebuttal
					to the dwell time for an FH PHY. In clause 9.3.3.5, no mention is made of how the PC handles the disruption to polling caused by the dwell time boundary. If the usual mechanisms are used, it would not issue frames containing CF-Polls if the polled station would not have time to respond with a maximum length MPDU. If the PC *can* issue frames containing CF-Polls regardless of proximity to the dwell time boundary, this should be stated, as the retransmission mechanisms must be implemented so as to handle the dwell time boundary.	medium by the PC occuring after, and synchronized with, the dwell time boundary". Clause 9.3.3.5 should have the following text added at the end of the last paragraph: "The PC shall not issue frames with a sub-type which includes CF-Polls if insufficient time remains before the dwell time boundary to permit the polled station to transmit a Data frame containing a maximum length MPDU."	explicitly listing insufficient time to transfer an MPDU before a medium occupancy boundary as a reason a CF-pollable station may respond with Null(no data) to a CF-Poll in Table 20 (9.7), since the decision at the last meeting to use Null(no data) as the affirmitive response to a CF-Poll when no MPDU nor ACK needs to be transferred. This also results in a consistent treatment of DCF & PCF transmission decisions near a dwell boundary, with the station that has a frame to send (hence knows how much time is needed for the MPDU/MMPDU + ACK) making the decision about whether to inititate the transfer. It was noted that the PC could distinguish a Null(no data) due to empty transmit queue from Null(no data) due to insufficient time for the MPDU transfer if the responding station sets the More Data bit in the Null(no data) or CF-ACK(no data) when an MPDU is queued. ACCEPTED, but with a different, more consistent and more efficient resolution that is accepteable to the commenter.
138	9.3.3.4	jz	t		aHandshakeOverhead is not in the MIB. Is it the right thing to use here? And note that it depends on the data	Redefine here or add to MIB	Editorial Editorial change since the MIB

Seq. #	Section number	your ini-tials	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Corrected Text	Disposition/Rebuttal
					rate used for the control frames, so the value used to limit aCFPMaxDuration has to allow 1 Mbps operation.		attribute was deleted in D4.0. The equation now calculates the equivalent value from available information & attributes. **ACCEPTED**
139	9.4	jz	t		I think "varying" is a confusing word in the fourth paragraph.	Replace "varying" with "arbitrary"	**Editorial ACCEPTED**
140	9.5	jz	t		Shouldn't reassembly be based on the Address 2 field, regardless of the Source Address? It would still work just as well (probably better) and is easier to implement.		**Editorial same issue as comment #126 Changed the text reflect that it is Address 2 field indeed. ACCEPTED**
141					*COMMENT NUMBER 141 DOES NOT EXIST*		
142	9.5	jz	t		Duplicate fragments are those that have the Retry bit set and have the same ephemerides as an immediately-previous MPDU from the same transmitter. The last paragraph makes it sound like if you *ever* see the same information again (even after the counters have wrapped around) you discard the "duplicate". Wrong!		**Editorial / Clarification This is a clarification. Reference to clause 9.2.8 where duplicate detection and recovery is described in detail is added. ACCEPTED**
143	9.6	jz	t		The PHY MIB should have an entry for the mandatory rates, and the second paragraph should reference that variable.		**DECLINED because this is not a MAC issue.**
144	9.6	msu	T	Y chan ged to N	The current draft does not specify an algorithm for switching between available rates. An algorithm is required to accommodate the large number of users who require a combination of speed and range.	**Delete** the following sentence: "The algorithm for selecting this rate is implementation dependent and is beyond the scope of this standard."	**The text in the draft is sufficient to be interoperable. DECLINED**
145	9.6	AS	t	n	**What is the difference between, one of the PHY mandatory rates (where are these specified) and, one of the rates included in the aBSSBasicRateSet.** **Unless there is another MIB attribute that defines the PHY mandatory rates, and these are different from the aBSSBasicRateSet, the text should be changed to use aBSSBasicRateSet in this section.**		**Editorial / Consistency Text changed to state that all the control frames shall be transmitted at aBasicRateSet. ACCEPTED**
146	9.7	AS	t	n	Table 20 does not and nowhere else that I could find is		**Editorial / Clarification**

Seq. #	Section number	your ini- tials	Cmnt type E, e, T, t	Part of NO vote	Comment/Rationale	Corrected Text	Disposition/Rebuttal
					the mechanism for transferring fragmented frames during a CFP described. My impression is that it shall be: Data(dir)+CF-Poll{+CF-Ack} [Frag - ACK -] Last - Data(dir){+CF-Ack} [Frag - ACK -] Last - [ACK | CF-Ack]		The mechanism is there in Table 20 lines 4 thru 8. The Data(dir) allows the case of fragment and has been re-defined to mean any directed MDPU. The lines in the comment are not sufficient because they do not cover fragmented MSDUs from the PC {where the initial Data(dir) is a fragment} nor does an embedded ACK {vs. CF-Ack+CF-Poll(no data)} provide the proper intermediate acknowledgement from the PC {which could also send a fragment with CF-Ack+CF-Poll} The comment resolution group felt adding all possible frag & last combinations to Table 20 would end up less clear than allowing Data(dir) to mean any directed MPDU/MMPDU. If time permits, additional clarification text will be put in. **ACCEPTED the comment, but with different text.**
147					*COMMENT NUMBER 147 DOES NOT EXIST*		
148	9.8	jz	e		The last sentence "Individual frames within each of these sequences" is supposed to end 9.7. I think 9.8 got stuck in one paragraph too soon.		**Editorial** Moved text to end of 9.7 where it belongs **ACCEPTED**