

Monday, June 07, 1999 15:54:06

P802.11b Draft D5.0 Remaining Disapprove Comments and Resolutions

CI **XX** SC **P multiple** L # **332**
 David Bagby 3Com Corporation Vote VD

Comment Type **TR** Comment Status **R**

Review Comment 1: Technical Required

This reviewer does not accept the responses to previous comments I submitted re the 802.11b PHY draft (during internal 802.11 ballots) prior to the sponsor ballot. The responses were specious, sometimes factually incorrect. Therefore most prior positions will be reiterated for this ballot (for the benefit of the sponsor ballot reviewers).

To keep the review process productive, this reviewer asks that the 802.11 group refrain from analogy arguments about options in other portion of the 802.11 standard as an argument for the permissibility of options in this PHY. (The analogy arguments given bring to mind the typical stories of a mother asking a child whether they would jump off a cliff just because all their friends were doing it.) The context within which any given decision was made for previous portions of the 802.11 standard do not constitute out of context precedence for any later extensions of the standard.

When 802.11 authorized the 802.11b working group it was by a specific motion that required that the group develop a single high-speed PHY for the 2.4GHz band. In this reviewer's view the intent of the wording of that motion (which I made, so I believe I am qualified to speak to the intent) was to prevent the group from creating multiple (FH and/or DS) high-speed PHYs. The motivation was market driven – the market requirement for wider adoption of 802.11 is for a single high-speed PHY that meets the industry/market psychological need for at least 10Mbps. From a market perspective, the phrase "single PHY" means that no matter what combinations of options are implemented by different vendors, it shall be impossible for a customer to buy two compliant pieces of equipment which, under any circumstances, may fail to interoperate. This is the primary technical requirement that the 802.11b PHY specification must meet in order to acquire my yes vote.

In the opinion of this reviewer, the inclusion of several options within 802.11b D5.0 prevents the specification from meeting either the intended goal or the specific restrictions imposed by the motion chartering the group. The response of the group gives (in this reviewer's opinion) poorly developed arguments based on analogy and procedural arguments. The problems are not at the core procedural, they are technical – the included options, as specified, create interoperability problems.

Further comments will address specific problems in more detail.

SuggestedRemedy

Required change:

Remove options which create the possibility that if different combinations of options are implemented by different vendors, it becomes possible for a customer to buy two compliant pieces of equipment which may fail to interoperate.

Proposed Response **Response Status U**

REJECT. Rejected, all association requests must be responded with the same type of header and rate. Therefore, while the association may be denied, the station will be able to know that it has been rejected. All options are required to carry the basic

CI **XX** SC **10.3.3.1** **P** L # **183**
 Mike Trompower Telxon Corporation Vote VD

Comment Type **T** Comment Status **R**

PLME_join should be updated to reflect the station's support for the new options.

SuggestedRemedy

Proposed Response **Response Status U**

REJECT. Rejected. Them MLME_Join.request is not the mechanism for selecting the bits in the CIF. It simply identifies the BSS description of the BSS to join. The mechanism for setting the bits in the CIF is described in 7.3.1.4.

CI **XX** SC **18.1** **P** L # **188**
 Mike Trompower Telxon Corporation Vote VD

Comment Type **TR** Comment Status **R**

Last paragraph of this section.

We are under NO restrictions to make a high rate phy which interoperable with current FH PHY.

This statement implies many characteristics which are not defined in the current text.

SuggestedRemedy

Change the paragraph to the following:

Capability for identifying a channel agile mode is also provided. However, management of this function is outside the scope of this standard.

Proposed Response **Response Status U**

REJECT. This is an editorial comment. The referenced paragraph does not state that there is a restriction that there is an interoperable FH PHY. It is a statement of the existence of frequency agility, and a pointer to an annex that describes how to do it.

TYPE: TR/technical required T/technical E/editorial COMMENT STATUS: D/dispatched A/accepted R/rejected SORT ORDER: Clause, Subclause, page, line
 RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn Vote: E/ExCom VD/Disapprove VAC/Approve with Comments

CI **XX** SC **18.1**

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Cl XX **SC 18.1.2** **P** **L** # **190**
Mike Trompower Telxon Corporation Vote VD

Comment Type **TR** **Comment Status** **R**

Strike the last sentence.

The sentence creates many ambiguities - such as, do Cwmin, Cwmax, slottime, turnaround times, etc. default to those provided in the high rate PHY mib, or should the MAC be made aware of those currently used by the FH PHY.

SuggestedRemedy

Delete the last sentence

Proposed Response **Response Status** **U**

REJECT. The MAC and MAC management do not use the PHY MIBs. Therefore this editorial comment is rejected. There is no ambiguity because the normative requirements are described elsewhere in clause 18

Cl XX **SC 18.2.1** **P** **L** # **192**
Mike Trompower Telxon Corporation Vote VD

Comment Type **TR** **Comment Status** **R**

This section creates ambiguity.

It says that the long preamble is mandatory. Which means that it must always be supported. It then implies that the short preamble is intended for exclusive use; ie. a BSS will use only the short preamble.

In order to have the exclusive case, additional parameters must be added to the MIB and MAC which allow this mode.

If exclusivity is the intent of the PBCC and agility as well, then variables must be added for these as well.

In other words, will the PHY chips be created so that they can recognize on the fly which preamble is being used, or will they operate in one mode (long or short) only in order to demodulate the packet?

Will the PHY chips be created so that they can recognize on the fly whether or not PBCC is used and correctly demodulate the packet?

Likewise with the other combinations !!

SuggestedRemedy

Proposed Response **Response Status** **U**

REJECT. This is an editorial comment and rejected. The short preamble is properly supported through the changes in clauses 7 and 9.

Cl XX **SC 18.2.3.9** **P** **L** # **215**
Mike Trompower Telxon Corporation Vote VD

Comment Type **TR** **Comment Status** **A**

Confusion added - as stated in previous comments --

This section says ..."A receiver not configured to receive the high rate signals will not detect this SFD."

The implication is that the high rate PHY will be able automatically detect (at all times) between long and short preamble usage.

SuggestedRemedy

Clarify that this statement is correct or that the intended use is one or the other (long or short preamble) per BSS.

Proposed Response **Response Status** **U**

ACCEPT. Accepted, clarify that a station not configured to receive the short preamble will not detect this SFD.

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CI **XX** SC **18.3.3** P L # **222**
 Mike Trompower Telxon Corporation Vote VD

Comment Type **TR** Comment Status **A**

This section also adds to the confusion about intended operation.
 Reporting a single value, implies that the intent is to have exclusive operation.

Reported values for Preamble Length, Cwmin and Cwmax should be changed to report all valid values in a "mix and match" environment.

The fact that a mix and match mode MAC will be UNDULY BIASED towards stations using short preamble - better access because of shorter Cwmin, suggests that the intent is to have exclusive operation

SuggestedRemedy

I believe the intent is to have "mix and match", therefore, reporting Cwmin and Cwmax consistent with legacy systems is correct.

If the hooks are added to allow for exclusive BSS use of some options, shortening of CWMIn andMax would be OK

This points out that there is a hole in the system, which says that the BSS ought to report the current Cwmin and Cwmax times in the BEACON and PROBE frames.

Also points out that statements ought to be added to the standard which specifies which values a station uses.

Should the station use values reported by its PHY, or should it adopt those values presented in the BEACON and PROBES

Or remove all doubt, the high rate PHY uses same values as legacyDS PHY, regardless of mode of operation. However, this leaves a bias towards DS vs FH which "combo vendors" will have to address.

Proposed Response Response Status **U**

ACCEPT. Accepted, the legacy values are to be used and the shorter values removed.

CI **XX** SC **18.3.3** P **28** L **15** # **314**
 Anil K. Sanwalka Neesus Datacom Vote VD

Comment Type **T** Comment Status **R**

I have made this comment before.

There is no way for aPreambleLength to have 1 of 2 possible values. I would suggest leaving this as the value for long preamble. The TXTIME primitive should not use this value leaving it in the structure only to provide compatibility with the TGrev DSSS system.

SuggestedRemedy

Change value to 144

Proposed Response Response Status **U**

REJECT. Rejected, Its accepted to have a dynamic value for this parameter.

CI **XX** SC **18.4.4.2** P L # **225**
 Mike Trompower Telxon Corporation Vote VD

Comment Type **TR** Comment Status **A**

Add 'X' to table for PMD_CS.request

Add new section (18.4.5.xx) for PMD_CS.request which states the method for setting the CS_THRESHOLD according to the text

SuggestedRemedy

Proposed Response Response Status **U**

ACCEPT. Accepted in principle, Change CS_threshold to correlation threshold which does not have a setting method.

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CI **XX** SC **18.4.6.12** P L # **247**
 Mike Trompower Telxon Corporation Vote VD

Comment Type **TR** Comment Status **A**

The TBD must be resolved.

More accurately, this section ought to specify an exact hop time.
 If one system hops in 100usec and begins transmitting, the 224usec station (while compliant) is at a disadvantage or worse the two won't interoperate.

SuggestedRemedy

Resolve the TBD

Specify an exact hop time specification or put a statement that no transmission will occur until after the time specified here.

Proposed Response Response Status **U**

ACCEPT. Accepted, the TBD is resolved by removing the specification of settling rate. The hop time statement will be added by editor.

CI **XX** SC **18.4.6.12** P **49** L **17** # **293**
 Allen Heberling Eastman Kodak Co. Vote VAC

Comment Type **T** Comment Status **A**

...and the rate of change has settled to within TBDkHz/us.

SuggestedRemedy

Please provide specific value for this TBD.

Proposed Response Response Status **U**

ACCEPT. Partially accepted, text removed.

CI **XX** SC **18.4.6.14** P L # **250**
 Mike Trompower Telxon Corporation Vote VD

Comment Type **TR** Comment Status **A**

The PICS (Annex A4.3) references two temperature types, the text references three.

SuggestedRemedy

Change 18.4.6.14 to reflect two temperature ranges.

Proposed Response Response Status **U**

ACCEPT. Current TGrev has two types. Editor will change to these two types.

CI **XX** SC **18.4.6.6** P **45** L **48** # **294**
 Jeff Fischer MICRILOR, Inc. Vote VD

Comment Type **TR** Comment Status **R**

The PBCC (i.e. coded) mode should be required, not optional. This issue is not related to the debate of having "options" in the standard, but to needing the PBCC mode because it is the only way the standard can be generally useful to the industry. The CCK modulation is inherently very weak by today's communications standards. If the PBCC is not used then the only way to make this waveform useful is with a severe measure of equalization. Therefore the only way to make this standard a useful one depends on a companies implementation, not on the standard waveform itself. By making the PBCC a requirement then the standard waveform itself will have inherent utility. The argument that there are commercial reasons to make a poor link is not a good one. Commercially speaking, the equalizer is a more complex, more costly, more power consumptive circuit to implement than the PBCC circuits.

SuggestedRemedy

Make this mode required for a standard implementation.

Proposed Response Response Status **U**

REJECT. Rejected, CCK has been adopted as a mandatory modulation with well documented performance. PBCC has been added as an option for certain environments.

CI **XX** SC **18.4.6.7** P L # **255**
 Mike Trompower Telxon Corporation Vote VD

Comment Type **TR** Comment Status **R**

We are under NO restrictions to make a high rate phy which is interoperable with current FH PHY.

The agility option enables a form of tolerance and coexistence, but not interoperability with current FH phys.

The statement referencing "shall meet requirements of ..." opens a can of inconsistency worms as described above.

SuggestedRemedy

Change text to following:

The channel agility option gives a high rate phy implementation the flexibility to move about the band. The management (determination of when and where to hop) of this option is outside the scope of this standard. When the channel agility option is enabled, the implementer may make use of both FH and DS parameter sets in BEACON and PROBE frames.

Proposed Response Response Status **U**

REJECT. Rejected, the requirements for hopping parameters are to be included in clause 18.4.6.7 by moving them from F1 through F3. The sequence of hopping must be specified in order for all stations to operate on the same channel.

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CI **XX** SC **18.4.6.7** P **48** L **34-35** # **316**
 Anil K. Sanwalka Neesus Datacom Vote VD

Comment Type **TR** Comment Status **A**

Sorry guys but this one is important.

Firstly:
 Channel agility does not enable FH interoperability as it is claimed here and in Appendix F. It simply allows an implementer to build a "dual-mode" radio that can be used to colocate a DS and FH BSS. My understanding of the result of the last meeting was that we would put in frequency agility as an option without any specific claim for FH interoperability, with the knowledge that a "smart" implementer could create a system with radios that could switch between DS and FH modes.

I feel that frequency agility may be a useful thing in and of itself without any reference to FH interoperability.

Secondly:
 Here it says that the hop sequences shall be as described in Annex F. In other places it says that Annex F is informative. I don't think you can have it both ways.

My feeling is that for there to be any kind of interoperability the hop sequences have to be normative.

SuggestedRemedy

Remove references to FH interoperability from clause 18.
 Define Hop sequences and make them mandatory in clause 18.
 Include Appendix F as an informative annex describing FH interoperability (I think that is what it is now).

Proposed Response Response Status **U**

ACCEPT. Hop sequences added to clause 18, but references to FH interoperability not removed.

CI **XX** SC **18.4.8.1** P L # **265**
 Mike Trompower Telxon Corporation Vote VD

Comment Type **TR** Comment Status **R**

These sections should specify as to whether this performance is achieved with or without or regardless of the "LOCKED" bit.
 If different performance expectations are anticipated, so state.

SuggestedRemedy

Proposed Response Response Status **U**

REJECT. Rejected, the specification apply whether or not the locked bit is set. There is no mention of the Locked bit in any of these sections.

TYPE: TR/technical required T/technical E/editorial COMMENT STATUS: D/dispatched A/accepted R/rejected SORT ORDER: Clause, Subclause, page, line
 RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn Vote: E/ExCom VD/Disapprove VAC/Approve with Comments

CI **XX** SC **18.4.8.2**

CI **XX** SC **18.4.8.1** P L # **266**
 Mike Trompower Telxon Corporation Vote VD

Comment Type **TR** Comment Status **R**

These sections should specify as to whether this performance is achieved with or without or regardless of the "LOCKED" bit.
 If different performance expectations are anticipated, so state.

SuggestedRemedy

Proposed Response Response Status **U**

REJECT. Rejected, the specification apply whether or not the locked bit is set. There is no mention of the Locked bit in any of these sections.

CI **XX** SC **18.4.8.1** P **54** L **16** # **267**
 Stan Reible MICRILOR, Inc Vote VD

Comment Type **T** Comment Status **R**

We need to select a transmit modulation approach which can provide better receiver input level sensitivities in fielded equipment.

SuggestedRemedy

Place a tighter sensitivty constaints on the equipment (and emerging chip designs)implementing the proposed standard.

Proposed Response Response Status **U**

REJECT. Rejected, this is a minimum requirement on implementations and allows low cost.

CI **XX** SC **18.4.8.2** P L # **268**
 Mike Trompower Telxon Corporation Vote VD

Comment Type **TR** Comment Status **R**

These sections should specify as to whether this performance is achieved with or without or regardless of the "LOCKED" bit.
 If different performance expectations are anticipated, so state.

SuggestedRemedy

Proposed Response Response Status **U**

REJECT. Rejected, the specification apply whether or not the locked bit is set. There is no mention of the Locked bit in any of these sections.

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CI **XX** SC **18.4.8.4** P L # **270**
 Mike Trompower Telxon Corporation Vote VD

Comment Type **TR** *Comment Status* **R**
 Remove the reference to a timer in CCA mode 2.
 The mode says report busy upon detection of signal by carrier sense, therefore, the timer is not necessary.

I take this to mean that a high rate PHY must recognize and determine carrier sense for BOTH barker and CCK modulation.
 This means that a high rate PHY which does not implement or recognize the

SuggestedRemedy
 Delete reference to timer in mode 2.

Proposed Response *Response Status* **U**
 REJECT. Rejected, the timer insures coexistence by making sure that a long preamble only station can defer enough time on a short preamble transmission and also protects the system when the header is corrupted.

CI **XX** SC **18.4.8.4** P L # **269**
 Mike Trompower Telxon Corporation Vote VD

Comment Type **TR** *Comment Status* **R**
 If the timer is not removed, then
 The algorithms for CCA should have different numbering from those used in section 15.
 The MIB should reflect the additional modes as well.
 The algorithms using a timer are not the same as those which do not.

SuggestedRemedy
 Mode 2 should become new mode 4
 Mode 3 should become new mode 5

Change in 18.4.8.4 and in PICS HRDS11

Proposed Response *Response Status* **U**
 REJECT. Rejected, the specifications for the high rate PHY stand alone. They may be like the low rate PHY, but do not need to be numbered in sequence with the CCA modes of that PHY.

CI **XX** SC **18.4.8.4** P **55** L **15** # **271**
 Stan Reible MICRILOR, Inc. Vote VD

Comment Type **T** *Comment Status* **R**
 While lower-transmit-level equipment is likely to be of a lower performance nature, dropping the energy detection threshold levels for such equipment by 10 dB does not appear to be full justifiable.

SuggestedRemedy
 Consider a 4-6 dB lowering of the energy detection threshold levels for lower performance equipment.

Proposed Response *Response Status* **U**
 REJECT. Rejected, this scheme was to allow low power, limited range cells.

CI **XX** SC **7.3.1.4** P **5** L **18** # **274**
 Stanley Reible MICRILOR, Inc. Vote VD

Comment Type **T** *Comment Status* **R**
 Channel Agility is not a requirement for high rate DS nor does it insure backward compatibility with devices implementing the existing standard. The options of short preamble, PBCC, and channel agility will combine to introduce a Multi-Standand Product

SuggestedRemedy
 Eliminate the option for channel agility. Greatly shorten the long preamble to eliminate a need for the optional short preamble.

Proposed Response *Response Status* **U**
 REJECT. Rejected. Frequency agility provides valuable capabilities for both interoperability with FH systems and or use in uncoordinated systems where interference is a great problem.

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P802.11b Draft D5.0 Remaining Disapprove Comments and Resolutions

CI **XX** SC **7.3.1.9** P L # **276**
 Mike Trompower Telxon Corporation Vote VD

Comment Type **TR** Comment Status **R**

The three new reason codes are not supported by stations which are compliant to the current (1997) standard.
 The existing products, "should" ignore the three new capabilities bit definitions established in 7.3.1.4, however, the 1997 spec says they are defined to be always zero - it does not say what is proper course to take when a '1' bit is received.
 Since the current systems cannot interpret these bits and are not aware of these new reason codes, there is no way for them to determine the reason for denied association.

Section 18 states that the long preamble is MANDATORY. Section 18.2.3.9 implies that long and short are used together. Section 18.2.5 states that the decision for using long or short is a management decision and implies packet by packet basis. To me this means "mix and match" is the intended operation.

Section 18 states that these new capabilities are optional. Section 7.3.1.4, when defining these new capabilities, implies that these features may be used (or not) on an individual packet by packet basis.

If the intent is to define the use of these new options as exclusive use and mandatory to join a BSS when enabled, then the station must know in advance (PHY bits) how to decode the frame and whether to recognize the short preamble.

SuggestedRemedy

I believe the intent was to allow mix and match operation. Therefore, no station can be denied access to the BSS based on non-support and these reason codes will never be used and should be deleted.

If the intent is to give a vendor the ability to selectively discriminate against stations not supporting a particular optional mode, additional MIB parameters should be defined which allow configuration of the use as mandatory or optional within a BSS. - then the reason codes can be kept, although only recognized by stations compliant to this newer version of the draft.

Proposed Response Response Status **U**

REJECT. Rejected, reason codes received that are other than 'successful' will still indicate a failure of association. See clauses 10.3.6.2 and 11.3.1.

CI **XX** SC **Annex A.4** P L # **280**
 Mike Trompower Telxon Corporation Vote VD

Comment Type **TR** Comment Status **R**

HRDS8 - states that hop sequences are MANDATORY when agility is present.
 First, this line item is not given a text reference.

Second, this feature falls outside the scope of 802.11. It must be controlled by an outside management entity, and therefore is outside the bounds of 802.

There are many 'desirable' methods which could be employed to decide when and where to hop. Unless ALL methods are provided for (and defined) this spec should not define a specific method. Besides, it is 'legally' outside the scope of 802.

SuggestedRemedy

Delete this check box from the spec.

Proposed Response Response Status **U**

REJECT. Rejected, the hop sequences are moved back into the normative part of the text. Therefore the check box is needed.

CI **XX** SC **Annex A4.3** P L # **281**
 Mike Trompower Telxon Corporation Vote VD

Comment Type **TR** Comment Status **R**

If the timer is not removed, then
 The algorithms for CCA should have different numbering from those used in section 15.
 The MIB should reflect the additional modes as well.
 The algorithms using a timer are not the same as those which do not.

SuggestedRemedy

Mode 2 should become new mode 4
 Mode 3 should become new mode 5

Change in 18.4.8.4 and in PICS HRDS11

Proposed Response Response Status **U**

REJECT. Rejected. This is a new PHY with 4 rates. There is no coupling between the numbering of clause 15 and clause 18.

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Cl **XX** SC **Annex F** P L # **284**
 Mike Trompower Telxon Corporation Vote VD

Comment Type **TR** Comment Status **R**

Delete this entire annex and all references to it. The information in this annex is outside the scope of 802.

This information (and many pointers to it in the text) alludes to the creation of a NEW PHY. This phy must be capable of receiving both FH and DS preambles. AS A SPECIFIC REFERENCE, the first sentence of annex f states that this option creates an "INTEROPERABLE" FH and DS PHY. This new PHY is not a part of the PAR.

If you attempt to use two radio devices, the mechanism for transferring the information between the two radios is not defined (and is outside the scope of 802) and will likely NOT Result in an "interoperable" solution as stated.

Further, the CCA mechanism which is referenced, is new functionality, not part of the main spec. no provisions have been provided in other parts of the spec (MIB and PICS)

SuggestedRemedy

Delete this entire annex - do not any of this information into section 18.

Proposed Response Response Status **U**

REJECT. Rejected by a vote. The content of F.1, F.2, and F.3 will be moved to clause 18. The technical content of F.4 remains in dispute and will remain in the annex. This is not a new PHY, but extended capabilities of one PHY, providing some FH interoperabili

Cl **XX** SC **Annex F** P **60** L # **296**
 John H. Cafarella MICRILOR, Inc. Vote VD

Comment Type **TR** Comment Status **R**

I believe the frequency-agility option violates our single-PHY PAR restriction. It perpetuates the dual-PHY situation into the future. It will work against acceptance of this already complex standard. Uncoordinated users (i.e., SOHO environment) may cause/experience disruption when this option is employed, and they will not understand why.

SuggestedRemedy

Remove Annex F, and all related cross-referencing from the main body of the standard.

Proposed Response Response Status **U**

REJECT. Rejected by a vote. The content of F.1, F.2, and F.3 will be moved to clause 18. The technical content of F.4 remains in dispute and will remain in the annex.

Cl **XX** SC **Annex F - Frequency H** P **60** L **51** # **285**
 Stanley Reible MICRILOR, Inc Vote VD

Comment Type **T** Comment Status **R**

The option for FH interoperability introduces unnecessary system complexity without enhancing high data system capability. The ability for users to readily switch operating channels will make it very difficult for high rate DS uses to find and effectively use any clear channels in environments such as office and industrial parks. In such environments there can be many small company users, each with different equipment and widely varying MIS and networking management approaches. This will be made more serious by the fact that some of these small companies will have multiple offices and sites within the same office parks which need connectivity. Yet htis is exactly the environment where wireless data links may be most needed.

SuggestedRemedy

Discourage the use of the channel agility option by striking it from the high rate standard.

Proposed Response Response Status **U**

REJECT. Rejected by a vote. The content of F.1, F.2, and F.3 will be moved to clause 18. The technical content of F.4 remains in dispute and will remain in the annex. This is not a new PHY, but extended capabilities of one PHY, providing some FH interoperabili

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CI **XX** SC **MAC changes to suppo** P **multiple** L # **297**
 David Bagby 3Com Corporation Vote VD

Comment Type **TR** Comment Status **R**

Review Comment 7: Technical Required
 Essentially all the proposed changes to the MAC portions of the 802.11 standard are present to support the options addressed in previous review comments (1 thru 6). I think there are additional problems that are created by the proposed MAC changes.

New bits have been defined in the capability information field. However, the MAC header version has not been updated. How is a station supposed to know how to parse the information? If you change the version level then only new implementation (presumably those that come with an 802.11b implementation) will understand the new capability bits. That would of course also prevent the long PHY header interoperability capability since the old version MACs will not understand the new version mac info.

If you don't change the version information, then what problems may occur? What will a new MAC implementation do when it gets an old MAC capability frame? Will it take action based on the values of the newly defined bits? Will the action be correct? What will happen if an old MAC gets a new MAC header with information in bits that were specified as reserved.

I believe these problems arise because the 802.11b draft proposes putting PHY capabilities into the MAC capability field. The MAC Capabilities field is for MAC capabilities. Mixing PHY info into the MAC capability field makes the MAC version dependent upon the PHY being used. That violates one of the prime design goals of 802.11: A single MAC for multiple PHYs. How should the bits be set in a new MAC header when it's running some other PHY (802.11a or a later developed PHY...)?

I also note that the charter of 802.11b was to create a PHY specification. It was not to change the MAC. Personally, I would accept minor changes to the MAC that do not cause any issues with existing 802.11 MAC implementations – but the changes proposed in 802.11b probably fail that test. Until an analysis of all possible combinations of interactions between “old” and “new” MAC implementations containing the proposed changes is done, presented and circulated for review, and deemed not to contain any problems, I will have to vote no on the 802.11b draft.

Please note that there is an easy way out of the problem: Adopt all the other 802.11b PHY changes requested in my review comments. That would eliminate the PHY options that are the source of the problems; there would be no need for any of the changes proposed to the 802.11 MAC specification, and without the proposed changes, this particular set of issues disappears.

SuggestedRemedy

Required change:
 Adopt all the other 802.11b PHY changes requested in my review comments; eliminating the need for any of the changes proposed to the 802.11 MAC specification; and then delete the corresponding MAC changes.

Proposed Response Response Status **U**

REJECT. Rejected, we did not adopt all of the other changes needed to adopt this resolution.

CI **XX** SC **many** P **many** L # **298**
 John H. Cafarella MICRILOR, Inc. Vote VD

Comment Type **TR** Comment Status **R**

My concern here is the existence of too many options: 1) for the high-rate PHY there are 11- and 5.5-Mbps rates using either CCK or PBCC; 2) the long and short PLCP Headers; and 3) the frequency-agility option. This standard is all on paper, and is a design by committee. Unlike the adoption of 802.3 and the original 802.11, where there was considerable experience before the standards, there is no practical experience with this complex collection of stuff.

SuggestedRemedy

- 1) Keep CCK or PBCC, not both (prefer keep PBCC);
- 2) Keep long or short header (prefer short);
- 3) Eliminate frequency agility.

Make the standard simpler to implement and EASIER TO USE.

Proposed Response Response Status **U**

REJECT. 3. Rejected by a vote. Each of the three options mentioned in this comment provide distinct advantages, either in implementation or performance, without threatening interoperability.

CI **XX** SC **PBCC related text** P **multiple** L # **299**
 David Bagby 3Com Corporation Vote VD

Comment Type **TR** Comment Status **R**

Review Comment 6: Technical Required
 Prior to Sponsor ballot I had requested the deletion of the PBCC option. I again make the request as part of my sponsor ballot. The utility provided by the option is insufficient (in this reviewer's opinion) to merit the complexity involved. In my (informal) sampling of people planning to implement the 802.11b PHY, I did not find anyone that planned to implement the option. The option exists due to political deals made in earlier meetings. It's time to be pragmatic and clean up the side effects of past politics – delete the option that (I believe) will not be used. If this is done it makes the resolution to the next comment (#7) easier as a positive benefit.

SuggestedRemedy

Required change:
 Delete PBCC option.

Proposed Response Response Status **U**

REJECT. REJECT.

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CI **XX** SC **PICs CF6** P **55** L # **300**
 David Bagby 3Com Corporation Vote VD

Comment Type **TR** Comment Status **A**

Review Comment 4: Technical Required
 Item CF6 in the PICs (page 55) is OFDM PHY for the 5GHz band. Delete this line from the 802.11b PICs. It has no business existing in the 802.11b PHY draft (it should exist in the 802.11a draft instead).

SuggestedRemedy

Required change:
 Delete item CF6 in the PICs (page 55) for the OFDM PHY for the 5GHz band.

Proposed Response Response Status **U**

ACCEPT. line will be removed.

CI **XX** SC **PICs HRDS3** P **56** L # **301**
 David Bagby 3Com Corporation Vote VD

Comment Type **TR** Comment Status **R**

Review Comment 5: Technical Required
 Prior to the sponsor ballot I had requested during internal 802.11 ballots that the FH interoperability option be made mandatory. The group responded to that request by saying "Partially accepted, the FH PLCP frame format option has been deleted". Doing exactly the opposite of what was requested is really stretching the meaning of the phrase "partially accepted"...

However, my primary concern was that the option created interoperability issues. The deletion of the option does remedy my concern. I accept the change in draft 5.0. Please complete the deletion by making the following edit:

Delete PICs item HRDS3 page 56 "Channel Agility Option". Section 18.2 no longer has the option so the PICs can't reference it.

SuggestedRemedy

Required change:
 Delete PICs item HRDS3 page 56 "Channel Agility Option".

Proposed Response Response Status **U**

REJECT. REJECT.Rejected, the channel agility option is in 18.3.2 and is not deleted, so a PICs item is necessary. The reference in the PICs will be corrected from 18.2 to 18.3.2

CI **XX** SC **PICs HRDS3&6** P **56** L # **302**
 David Bagby 3Com Corporation Vote VD

Comment Type **TR** Comment Status **A**

Review Comment 3: Technical Required
 I had previously requested that the use of the short preamble be either deleted or made mandatory. The 802.11b group prior to sponsor ballot declined the request. The problems caused by the option specifications remain.

SuggestedRemedy

Please refer to the PICs in draft 5.0:
 Item HRDS3 (page 56) is shown as optional and refers to section 18.2.
 Item HRDS6 (page 56 - short preamble process on RX) is shown as optional and refers to section 18.2.6.
 Neither the PICs nor the referenced text sections tie the two options together.

From what I've read that the following are possible compliant implementations:

- Vender A: Implements Short header on TX and RX (both options).
- Vender B: does not implement any short header options (neither Option)
- Vender C: Implements short header on TX option, but not the RX option.

Once the use of short headers is turned on at a sending station here are some of the bad cases possible given the current draft:

- Case 1: A's equipment always sends short headers, B can never talk to him. Result: non-interoperability.
- Case 2: B can't talk to C. Result: non-interoperability
- Case 3: C can't talk to C! Result: non-interoperability

SuggestedRemedy

Required change:
 Here is what is required:
 1) RX short header processing must be mandatory if the Tx short header option is implemented. That will prevent case 3 above.
 2) The purpose of the short header is to provide performance (as the long header limits thput). The purpose of the long header is antenna to antenna interoperability between 1 and 2 Mbps 802.11 DS PHYs (the FH is now irrelevant due to the removal if the FH compatibility stuff in D5.0) and an 802.11b PHY.

The use of an option is an attempt to have both. The option approach fails because it causes interoperability issues, effectively providing neither benefit.

Either

- a) Delete the short header (effectively deciding that old PHY interoperability is more important than performance) or
- b) Make the use of the short header mandatory (making performance more important than old PHY compatibility).

I can accept either choice a) or b).

My preference is that the standard take choice b) as there are other ways to achieve data interoperability between 1-2 Mbps DS PHYs and the proposed 802.11b PHY. It can be accomplished by multiple APs and let the interoperability occur in the DS; it is not necessary to have antenna to antenna interoperability between the various PHY specifications (this is how

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one moves data from a current FH PHY station and a DS PHY station). This gives the 802.11b system both data interoperability (the real user requirement) and performance.

Proposed Response *Response Status* **U**

ACCEPT. Accepted, the use of the short preamble is coupled between RX and TX by changing the HRDS6 dependent on HRDS3