

Tentative Minutes of the IEEE P802.11 Working Group

**Interim meeting
San Diego, California
January 8-11, 1996**

Monday, January 8, 1996, 9:00 AM

The meeting was called to order at 9:00 AM Vic Hayes, chairman IEEE P802.11¹⁾ in the chair. Carolyn Heide secretary. Karen Goodburn and Ian Gifford managing document originals and copying, managing distribution and pigeon hole organization. Wayne Moyers handling the attendance list. The agenda document for this meeting is 802.11-95/240.

Objectives for this meeting, all groups

- Complete unresolved LB comments
- Complete D2 draft editing using D2.1 as base
- Output of this meeting (D2.1) to complete D2 LB comment processing resulting in D2.2 (D3.0)
- Finalize result of ad-hoc on Multi Rate Mechanism
- Finalize the PICS proforma
- Submit D3.0 for WG Letter Ballot

¹⁾The officers of the Working Group are:

Mr. VICTOR HAYES

Chairman IEEE P802.11

AT&T Wireless Comms & Netw. Div.

Phone: +31 3402 76528

Fax: +31 3402 39125

E-Mail: Vic.Hayes@Utrecht.ncr.com

Ms. Carolyn Heide

Secretary IEEE P802.11

Spectrix Corp.

Phone: +1 708 491 4534

Fax: +1 708 467 1094

E-Mail: 71041.3262@compuserve.com

Mr. BOB O'HARA

Editor IEEE P802.11

Advanced Micro Devices

Phone: +1 408 987 2421

Fax: +1 408 987 2814

E-Mail: bob.ohara@amd.com

Mr. STUART KERRY

Vice Chairman IEEE P802.11

Symbol Technologies Inc.

Phone: +1 408 369 2634

Fax: +1 408 446 4630

E-Mail: stuart@psd.symbol.com

Mr. JON WALTER ROSDAHL

Vice Chairman IEEE P802.11

Novell Inc.

Phone: +1 801 429 3183

Fax: +1 801 429 7232

E-Mail: jrosdahl@novell.com

Mr. LEON SCALDEFERRI

Vice Chairman IEEE P802.11

NSA

Phone: +1 301 688 0293

Fax: +1 688 0289

E-Mail: lsscald@alpha.ncsc.mil

Mr. DAVE BAGBY

Chair IEEE P802.11-MAC group

Advanced Micro Devices

Phone: +1 408 987 2423

Fax: +1 408 987 2800

E-Mail: david.bagby@amd.com

Mr. DEAN KAWAGUCHI

Chair IEEE P802.11-PHY group

Symbol Technologies Inc.

Phone: +1 408 369 2629

Fax: +1 408 369 2740

E-Mail: deank@psd.symbol.com

Mr. GREG ENNIS

Editor IEEE P802.11

Phone: +1 408 356 4775

Fax: +1 408 358 8991

E-Mail: gennis@netcom.com

1. Opening

1.0 Secretary: Carolyn Heide.

1.1 Roll Call: People in the room were invited to introduce themselves.

1.2 Voting rights:

Participation in debates, moving and seconding is only permitted by voting members, in all 802.11 meetings (at all levels). The subgroup chairs may permit observers to participate in debates.

Voting at the working group level is by voting members only. Chair may permit observers to participate in debate. To become a voting member:

- participate in at least 2 out of 4 consecutive plenary meetings. Voting rights start at third meeting
- participation in at least 75% in meetings, in the room
- one interim may be exchanged for a plenary
- Voting members will get a token to be used at votes

Voting rights can be maintained:

- by participation in 2 plenary meetings within 4 consecutive plenary meetings
- one interim may be substituted for a plenary

Voting rights may be lost:

- after failing to pay the conference fee
- after missing two out of three consecutive letter ballots

Current membership status requires 40 members for a quorum. This meeting does not have a quorum.

1.3 Attendance list, Registration: The attendance list was distributed - 75% attendance according to the attendance list is required to qualify for attending the meeting as a whole, so make sure to sign the book. Copies of the attendance list are handed out before the end of each meeting.

- important for administration of voting rights that the attendance book is used properly.
- sign per meeting (morning, afternoon, evening). Do not sign ahead.
- place initials. Do not cross or underline.
- circle the letter corresponding to the meeting you attend when signing (F=full 802.11, P=PHY, M=MAC group).

Check e-mail addresses in the book:

- some addresses have been struck, or have a \$-sign added to the right - those received complaints from the reflector
- please strike your e-mail address if you do not use it
- if you do not disagree to receiving very long files, mark bulk e-mail with yes

1.4 Logistics: Document distribution is done using pigeon holes - you will find your copies and messages in the referenced location in the expanding file folders in the slot *in front of* your name.

Document distribution:

- sign in for a slot, remember the letter and number
- pigeon holes are file folders with a letter id on each folder and a number on each slot
- in each folder are numbered slots, each of which is 'owned' by a person
- each person owns slot in front of number

Coffee breaks at 10 AM and 3 PM. Noon to 1:00 PM lunch

1.5 Other announcements

1.5.1 Patent Policy - Old Policy (new policy released before the end of the meeting, Doc 96/14)

IEEE standards may include patented technology if there is no equivalent, noninfringing way of achieving the objectives of the standard, if it is justified for technical reasons, and if the patent holder agrees to nondiscriminatory licensing at reasonable rates.

Request all participants to indicate if they know patent on which 802.11 may infringe.

1.5.2 Help Preparing next mailing, Thursday evening: Carolyn Heide, Tom Baumgartner

1.5.3 Other Announcements: none

2. Approval of the minutes of the previous meeting

2.1 Montreal meeting, Document IEEE P802.11-95/234: no quorum

2.2 Matters arising from the minutes: none.

3. Reports

3.1 The Executive Committee, by Vic Hayes

Strategic Study Group

- New name Strategic Planning Advisory Group (SPAG)
- Defeated with 3,5,7

Approval to forward 802.11 draft standard to Regulators for review

- change to reflect no funding available
- approved unanimously
- Vic is looking for name of people in Canada, Mexico and Japan? (There is a suggestion that the FCC would be able to help with the foreign country administrations.)

The FH section changes didn't make it into draft 2.1, so it was not an up to date copy that went out. It does not contain hopping patterns which the FCC can approve.

Standard motion to forward draft standard to next level

- see document 96/6

3.2 The Editors, by Bob O'Hara:

This week when resolving letter ballot comments Bob will give anyone who needs it separate section documents -don't edit the whole draft document as was distributed in the mailing.

3.3 The Ad-hoc on Multi-Rate Mechanism, deferred until Johnny Zweig is present

3.4 San Jose meeting finances: don't have it

3.5 Schaumburg meeting finances: defer until Jim McDonald is present

3.6 FCC pre-meeting: Vic reviewed contents of Document 96/4. Vic will circulate presentation copies.

3.7 IPR Letters: 96/5 available later this week

4. Registration of Contributions and assignments to subgroups

MAC group: 96/1 (available later this week maybe), 96/3 (in mailing)

PHY group: none

Full group: 96/7(Vic Hayes), 96/8 (Chris Zegelin)

5. Adoption of Agenda: shown in the agenda document 95/240 and 240R1. Adopted by consensus.

6. Unfinished Business:

6.1 Roadmap to letter ballot

SCHEDULE FOR WORKING GROUP CONFIRMATION BALLOT

End of meeting	Jan 11 (Thu)
Editors deliver	Jan 25 (Thu)
Draft on server	Jan 27 (Sat)
Mailing date	Feb 2 (Fri)
Ballot closes	Mar 3 (Sun) (30 days from mailing date, 38 days from server)
Result on server	Mar 7 (Thu)
Meeting start	Mar 11 (Mon)

SCHEDULE FOR INITIAL SPONSOR BALLOT

End of meeting	Mar 15 (Fri)
Editors deliver	Mar 21 (Thu)
Draft on server	Mar 23 (Sat)
Draft at IEEE	Mar 25 (Tue)
All drafts mailed	Mar 29 (Fri)
All drafts received	Apr 2 (Tue)
Ballot closes	May 2 (Thu) (30 days from mail arrive date, 40 days from server)
Result on server	May 8 (Wed)
Meeting start	May 13 (Mon)

SCHEDULE FOR SPONSOR CONFIRMATION BALLOT

End of meeting	May 16 (Thu)
Editors deliver	May 23 (Thu)
Draft on server	May 25 (Sat)
Draft at IEEE	May 27 (Tue)
All drafts mailed	May 31 (Fri)
All drafts received	Jun 4 (Tue)
Ballot closes	Jun 19 (Wed) (15 days from mail arrive, 25 days from ftp-server)
Result on server	Jun 25 (Tue)
Meeting start	Jul 8

Standards Board

Proposed standard due at IEEE office: August 9.

Standards Board meeting September 19

Next opportunity (but needs ExCom e-mail ballot):

Standard at IEEE office: November 1

Standards Board meeting: December 10

Note that there is no time for section editing after meeting the in March - all editing must be complete on sections at the meeting.

There is some sentiment that if there are too many comments on the next draft, they can't be processed at one meeting. We will try our best, but the comments have to be addressed seriously, so if it can't be done, it can't.

The standard motion for the ExCom is in Doc 96/6 - give any comments on this to Vic.

7. New Business:**7.1 Wishlist FH proposed by Naftali**

Do not have a quorum, so only a recommendation can be made. If it is discussed at all, it should be discussed in the PHY group. The goal for this meeting is to produce a draft, and any other discussion should be secondary and not be held until that work has been done. This item will be removed from the presentation to the FCC because it cannot be approved here. The PHY group can discuss it after they do their work on the draft.

There is an opinion that the discussion of these items will be very short. Also, they may have an impact on the MAC. On the other hand, there is another opinion that it is a large rat hole, the discussion could be huge, and that this is new functionality on which we are chartered not to spend time.

7.2 RAST meeting

Motion #1: **Recommend that Vic Hayes represents the 802.11 committee at RAST3, Geneva, January 23rd, 1996.**

Moved by: Peter Chadwick
Seconded by: Wayne Movers

Motion 1 Discussion: none

Approved: 16 Opposed: 0 Abstain: 0 **Motion #1 passes**

7.3 NPRM on 60 GHz: Will be received and made available by Vic, hopefully here, at least in the mailing. There is an opinion that also work in CEPT and IETU study groups in this area should be considered. There is no objection to activating the standing regulatory issues committee when the NPRM is available.

7.4 Tele-conference with FCC, Wednesday: Will be handled as part of the full PHY group meeting.

(Return to agenda item) 3.3 The Ad-hoc on Multi-Rate Mechanism, Johnny Zweig

In summary, there are three basic viewpoints: leave it as is; get rid of multirate support entirely and let different rates be different PHYs; or made modifications to the existing duration field. Arguments against the third view are mostly that there are people who have difficulty changing the existing PLCP header and whether a longer header is adequately protected by the 16-bit CRC.

It is agreed by consensus to add agenda item 7.5 to discuss the tabling of motion 1 at the Nov. 1995 meeting.

7.5 Nov. 1995 meeting motion #1

Motion #2: **To take motion #1 of the Nov. 1995 meeting off the table.**

Moved by: Johnny Zweig
Seconded by: Jan Boer

Motion 2 Discussion: none

Approved: 16 Opposed: 4 Abstain: 1 **Motion #2 passes**

Motion #3: **To convene the full working group at 8:30 AM Tuesday Jan. 9 1996 to address motion #1 from the Nov. 1996 meeting.**

Moved by: Carolyn Heide
Seconded by: Peter Chadwick

Motion 3 Discussion: none

Opposed: none

Motion #3 passes

8. Adjourn for subgroups: 11:10 AM

**Monday AM & PM, 8 January, 1996
MAC & PHY subgroups**

**Tuesday AM, 9 January, 1996
Full Working Group**

The meeting was reconvened at 8:30 PM, by chairman Vic Hayes, Carolyn Heide secretary.

A. Announcements

A.1 Tutorial at March meeting

- volunteers requested to make/present presentations:
 - MAC - Belanger, Diepstraten, Ennis
 - PHY FH - Chayat
 - PHY DS - Boer
 - PHY IR - Baumgartner.
- style coordinator - Hayes
- time to reserve: 2 hours

Proposed agenda: listen to the two papers submitted and then have the discussion of Motion #1(Nov.) to come to conclusion. There are no objections to working to this agenda.

B. Multirate

B.1 Report of the Ad Hoc Multirate Study Group, Doc P802.11-96/10, Johnny Zweig

Missed a point that was made about PHYs that may need training sequences in the future, such that constraining them to have the same formats we have now may be technically infeasible.

Discussion:

The idea that Johnny slipped into the end of the document about having the PLCP header length field actually being duration instead was discussed and rejected previously, when multirate was first proposed.

B.2 Maximizing Primary Rate Traffic in a Multirate BSS, Doc P802.11-96/8, Greg Ennis

The presentation is directed to infrastructure networks, has not addressed operation in IBSS scenario specifically.

If an STA can only get association across at the low rate, then does the AP accept communication with that STA at the lower rate? Yes, enough to do the association process, but after that the AP does not accept the association. If it wishes to run a high rate BSS, then it must reject association

with any low rate only STA. If the AP accepts association with a mixed rate of STAs, then it must send management and broadcast/multicast frames at the lower rate.

But a STA which cannot go at the primary rate cannot hear the management frames (i.e. beacons) needed to associate anyway, so they will not even try to associate.

In the future there may be more than two rates. If you only allow people to associate at the primary rate, how do you deal with a multiplicity of secondary rates? The AP must support all secondary rates.

The primary rate for a BSS need not necessarily be the highest possible rate supported.

Discussion:

There is a feeling that this introduces installation and management complication for little gain over the current proposal.

B.3 Conclusion

Motion #1(Nov.) discussion:

Straw poll how many people hold the opinion there are no problems associated with the D2.1 Multirate mechanism? (no problems: 2, one or more problems: everyone else).

Motion #4:

Given that:

- the committee just asserted in a straw poll that there are problems associated with the D2.1 multirate mechanisms, and
- that it is not acceptable to forward a standard for sponsor ballot with a known deficient mechanism;

1) The problems associated with multirate shall be resolved, and text to reflect the correction required, shall be ready by Thursday 8:30 AM and during the Thursday afternoon plenary session said text shall be approved (or not) for incorporation into D2.2 via technical vote, XOR

2) If the multirate problems cannot be resolved and/or the text documenting the corrections is not adopted on Thursday, the D2.1 multirate mechanisms shall be removed from the draft and not be part of D2.2

Moved by: Dave Bagby
Seconded by: Chandos Rypinski

Motion 4 Discussion:

Clarification: accepting this motion thus precludes leaving the multirate mechanism as is.

In the interests of not wasting time voting to do what we all came here to do, call the question by Carolyn Heide, second Tom Baumgartner (6,13,1) - fails

Against the motion because leaving it as is is precluded by this. Call the question by Greg Ennis, second Tom Baumgartner (13,8,3) - fails

Against the motion there may be problems in the 2.1 proposal but we can live with it. Call question by Simon Black, second Wayne Moyers (16,7,1)

Approved: 5 Opposed: 16 Abstain: 2 **Motion #4 fails**

Motion #1(Nov.) discussion (cont.):

In favour of motion #1(Nov95):

What's broken is maintenance of the NAV. Multirate support clearly increases the probability of collisions. Moving the duration to the PLCP header as proposed in Doc 95/247 is a solution to this problem. Haven't heard any technical reason why we can't do that.

Doc 96/8 is good and would in fact be improved by the changes in 95/247.

With the duration available to all stations at running at all rates, all traffic (management frames included) can go at the primary rate. This improves the efficiency of the multirate mechanism as well as assisting the NAV maintenance. This also lessens the need to use RTS/CTS, and increases reliability in cases where it is not used.

Text should be generated this week to incorporate that into the standard. This is quite do-able this week. Doc 95/247 points out places that need change, as do associated letter ballot comments. Also need slight redefinition of duration and NAV update mechanism algorithm. Work has been done looking for changes - it is not massive.

Maybe some other changes can be made beyond 95/247.

From the ad hoc discussion group: The FH PLCP header has nice math properties of error tolerance because it is short. There is fear about increasing the error susceptibility by making it longer. The DS PHY doesn't seem to express the same concern.

Not expressed in the ad hoc discussion group: There is probably a concern for people who already have implementations. There may be a slow down in the introduction of getting 802.11 products on the shelf. There is a cost.

Lack of quantification of the cost versus benefit.

Helps the standard plan for taking advantage PHY changes coming in the near future, with the advent of faster PHYs.

Collision avoidance is important to the operation of the system. If half the STAs can't be seen by the STAs in the system because they are running at different speeds, that has to introduce a problem.

All traffic can go at any rate with this change, management frames don't have to stay at basic rate.

The higher error rate introduced by lengthening the PLCP header may be no worse than the collisions that will be introduced by not moving the duration field. At worst it is a couple of dB performance loss.

Against motion #1(Nov95):

The perceived problem is that an excess number of collisions will result from the mechanism as it is. What is there works, maybe this problem is not large enough to be worried. Will there be a significant degradation due to the existing mechanism - no. The problem is introduced into maintenance of the NAV, and that is not the primary collisions avoidance mechanism, and is clearly not to be heavily relied upon.

There is a fear that if this standard doesn't go out until next year that there is no point, defacto standard will have taken over. So let's not make any big changes.

The 96/8 proposal just introduces policies for using the basic mechanism - an improvement not a correction.

Determining what rate to pick is a very complicated thing, leaving it ambiguous is discomfoting. There is fear that the result will be compliant, but not compatible, systems because of no specified mechanism of rate switching. More changes must be made than just putting in that field to make multirate work properly. Haven't seen any numbers that justify the effort and delay in standard release that will be caused by making this change.

It is easier to add APs in an FH system to increase throughput, rather than increasing rate. Making this duration field change is not important to increasing throughput.

People are afraid of a large change in amount of text and number of places in the draft. A massive technical change at a late date.

There is a suggestion that if you see the length in the PLCP header, if you had a more bit there also that would be enough. Adding a more bit to the PLCP header would be good enough.

Call the question by Tom Baumgartner, second Wayne Moyers (no nays)

Approved: 10

Opposed: 10

Abstain: 4

Motion #1(Nov95) fails

14. Adjourn: 11:45 AM

Tuesday AM (remaining) & PM, 9 January, 1996
MAC & PHY subgroups

Wednesday AM & PM, 10 January, 1996
MAC & PHY subgroups

Thursday AM, 11 January, 1996
MAC & PHY subgroups

Thursday PM, 11 January, 1996
Full Working Group

The meeting was reconvened at 1:15 PM, by chairman Vic Hayes, Carolyn Heide secretary.

15. Opening

15.1 Announcements

15.1.1 Raw results will be available in diskette format

- dispositions of comments and submissions etc.
- draft text

15.1.2 IPR

- response to my letter 96/5
- changed IEEE patent policy 96/14

Discussion: rules are less strict. Not supposed to be concerned about patented stuff at the working group level, don't discuss it. Let the patent holders tell you whether or not it is relevant.

15.1.3 FCC NPRM 60 GHz

- no electronic copy yet
- paper copy is large
- comment period closes 60 days after publication in the Federal Register
- assume that is after the March meeting
- proposals for 802 positions requested shortly

15.1.4 Review of draft standard by FCC

- e-mail exchange with Rich
- proposed to postpone till next draft available
- asked for his dates during week of February 12 for tele-conference
- alternative for visit on Friday, March 8

15.1.5 distribution of disposition and text

- 3 diskettes for text for draft text
- 3 diskettes for disposition and other papers

15.2 **Document list update:** item deferred to after subgroup reports.

15.3 **Agenda adjustments:** adopted with minor modifications.

16. Reports

16.1 MAC Group, by Dave Bagby

Document 96/022 is the report from this group.

Nov. '95 Goals for Jan '96 mtg.

- Complete D2 draft editing using D2.1 as base.
- Use output of Nov. mtg. (D2.1) to complete D2 LB comment processing resulting in D2.2 (D3.0?).

Misc. Subjects

Nov. MAC minutes approved

This Week's Work Summary.

PICS Proforma

- Good progress made
- 4, 5, 8 completed so far, 6 in progress
- Other Clauses (1,2,3,7) not checked yet.
- PICS work reflects D2.1 not this weeks work.
- MAC Vote: 7, 0, 2

Motion #5: to adopt MAC PICS proforma work done so far.

Moved by: The MAC group
 Seconded by: Tom Baumgartner

Motion 5 Discussion: none

Approved: 17 Opposed: 0 Abstain: 0 *Motion #5 passes*

Section 6 LB comments vs 247 impacts

- D2.0 LB comments not resolved.
- 6 comments were resolved, but reversal of 95/247 caused a problem.
- MAC vote: 7,1,6

Motion #6: that we decline LB comments 6-300, 301, 302, 304, 305, 307 because the plenary declined to alter the D2.1 multi-rate mechanisms.

Moved by: The MAC Group
 Seconded by: Chris Zegelin

Motion 6 Discussion:
 No change to text of draft, only comment resolution.

Approved: 14 Opposed: 1 Abstain: 2 *Motion #6 passes*

Add'l MAC mgt. SAP text for clause 7

- (later became submission 96/027)
- MAC Vote: 7, 0, 0

Motion #7: to adopt clause 7 MAC mgt. improvements from Tom Siep.

Moved by: The MAC Group
 Seconded by: Wayne Moyers

Motion 7 Discussion: none

Approved: 17 Opposed: 0 Abstain: 0 *Motion #7 passes*

CIF

- MAC vote: 10, 0, 2

Motion #8: **to adopt CIF changes rec. by Greg Ennis.**

Moved by: The MAC Group
 Seconded by: Chris Zegelin

Motion 8 Discussion: none

Approved: 17 Opposed: 0 Abstain: 0 *Motion #8 passes*

MAC State Machines (6.7) moved to informative Annex

- No technical change from D2.1
- Simply corrected placement of informative text.
- Moved:
- MAC Vote: 11, 1, 0

Motion #9: **that clause 6.7 be moved to an informative annex and that the MAC group continue to work according to agenda to improve that annex.**

Moved by: The MAC Group
 Seconded by: Tom Baumgartner

Motion 9 Discussion:

Some think this is not a normal standards thing to do. The English language is imprecise, state machines are better guides. Not having time to fix the state machine is not a good reason to make them only informative.

The document said right in it that the prose took precedence - that made them informative. Moving them was just a mechanical action.

At least one PHY section states that the state machines take precedence. Maybe this inconsistency should be corrected.

These state machines use a quite imprecise technical description technique. The text is becoming quite definitive, doing the PICS proforma is helping with this.

Call the question by Greg Ennis, second Tom Baumgartner (no nays)

Approved: 14 Opposed: 1 Abstain: 3 *Motion #9 passes*

6.7 vs more bit edits

- Editing now caught up with Nov. Votes.
- No plenary vote required

6.3 visio edit

- Editing now caught up with Nov. votes.
- No plenary vote required

95/227G

- MAC vote: 10, 0, 3

Motion #10: **to accept comment resolutions for 227G**

Moved by: The MAC Group
 Seconded by: Tom Baumgartner

Motion 10 Discussion:

Approved: 20 Opposed: 0 Abstain: 2 *Motion #10 passes*

96/3 Missing comments

- MAC vote: 12, 0, 0

Motion #11: to accept rec. resolutions of comment of 96/3

Moved by: The MAC Group
 Seconded by: Tom Baumgartner

Motion 11 Discussion: none

Approved: 21 Opposed: 0 Abstain: 1 *Motion #11 passes*

Bcast Reliability Improvement

- Clause 6 comment 197 still unresolved
- motion: that the reliability of bcast should be improved.
- MAC vote 8,2,2

- motion: that to improve reliability of bcast we ask a ad-hoc group to work out the details of an approach based upon a mechanism of PIFS before all bcast incl. beacon, restrict from new xmit at TBTT w or w/o a more bcast bit, and bring a detailed proposal back to the MAC group for action.

- MAC vote: 9, 2, 1

- rec.: (96/15): To use PIFS before all multicast including beacons with a restriction against new TX at TBTT by non-AP, w/ more bit by adopting the text changes presented within this presentation

- for MORE bit, see section 8.2.1.4 - already in the d2.1 Doc

- text in 96/15

- MAC vote: 7, 4, 4

Motion #12: To use PIFS before all multicast including beacons with a restriction against new TX at TBTT by non-AP, w/ more bit by adopting the text changes presented within this presentation

Moved by: The MAC Group
 Seconded by: Tom Baumgartner

Motion 12 Discussion:

The intent of the motion is pretty well agreed upon. There is consensus that the reliability of broadcast needs to be improved.

Against: There are simpler ways to solve this. There are ways an implementer can improve the reliability using existing mechanisms with no change at all. This creates a pseudo-PCF that doesn't follow the normal PCF rules.

In favour: a small change, modifies only an aspect of a way a PCF can work.

Against: the real problem is that the power management mechanisms have created periods of congestion that make broadcast unreliable. The power management mechanism should be fixed.

There is an opinion that the it is pretty clear that the MAC group doesn't agree about this yet.

Call the question by Simon Black, second Jim Renfro (10,8,-) fails

Against: no flexibility. If this doesn't work, we can't tell until there are implementations that push the limit, we are stuck. We have mandated that broadcasts must be done this way and the implementer can't create a scenario that works for them. Leaving as is gives implementers the ability to use the rules of the standard to increase the broadcast reliability.

In favour: if this doesn't pass, the unreliability of broadcast will be discussed next time, because there will be no votes based on this problem.

Against: the problem is caused by poor handling of contention, and this doesn't fix that.

In favour: if the problem were only due to power management polls that could be easily fixed, beacons are unreliable also. This solution increases the reliability of beacons by increasing their priority, and enhances power management by allowing STAs to go back to sleep after the broadcasts and not having to stay awake all beacon period.

In favour: this is quite similar to a PCF, but if it is not used and a true PCF is used to solve the problem, then PCF must be made mandatory.

Call the question by Jim Renfro, second Tom Baumgartner (many ayes, one nay)

Approved: 11 Opposed: 7 Abstain: 4 *Motion #12 fails*

TSF Timer Specification

- MAC vote: 5,4,3

Motion #13: **to change in clause 8.1.2.3 "0.0025" to "0.0035".**

Moved by: The MAC Group

Seconded by: Johnny Zweig

Motion 13 Discussion:

In favour: accuracy is very important in an AP. But in an IBSS where you resynchronize quit a bit based on other STAs information.

Against: accuracy of the frequency is important, and so is the resolution of the TSF timer. This is not good enough for an AP, which needs to be very accurate. There needs to be a different specification for APs and STAs. Further study is required.

Approved: 6 Opposed: 7 Abstain: 7 *Motion #13 fails*

PHY - new backoff # after hop...

- MAC vote: 11, 0, 2

Motion #14: **to adopt 96/17**

Moved by: The MAC Group

Seconded by: Tom Baumgartner

Motion 14 Discussion: none

Approved: 17 Opposed: 0 Abstain: 5 *Motion #14 passes*

"Future No vote" resolution info

Wim: No action requested. wanted to make group aware of issues. (see 96/19 for ref.)

- Var before fixed fields
- pad vs word alignment tradeoffs
- Misc. CIF bit issues
- ESS/IBSS bits
- CF aware
- Sync vs TBTT

Tom T: How tell when CF period begins?

- (submission has become Doc 96/026)

- MAC vote: 8, 0, 5

Motion #15: **to change Cf parameter CFP_rate as per text in cf_param.doc**

Moved by: The MAC Group

Seconded by: Johnny Zweig

Motion 15 Discussion: none

Approved: 15 Opposed: 0 Abstain: 5 *Motion #15 passes*

Dave Bagby
 - sec 6-218 - editors will change must to shall
 - sec 6-110 does not match history, research needed.

Johnny:
 - MAC vote: 8,1,3

Motion #16: *to move 4.4 inserted as new section into clause 6.*

Moved by: The MAC Group
 Seconded by: Johnny Zweig

Motion 16 Discussion: none

Approved: 17 Opposed: 1 Abstain: 3 *Motion #16 passes*

Let's make a D3 - "Third time is a charm..."
 - MAC Vote: 11, 0, 1

Motion #17: **That 802.11 create Draft D3 from D2.1 and adopted changes from this week and send D3 out for (regular, not confirmation) Letter Ballot per schedule passed out by Vic.**

Moved by: The MAC Group
 Seconded by: Dean Kawaguchi

Motion 17 Discussion:

Motion #18: **To postpone until after the other group reports.**

Moved by: Dave Bagby
 Seconded by: Tom Baumgartner

Motion 18 Discussion:
 The original motion adopts anything else that happens today, so postpone is in order.

Approved: 19 Opposed: 1 Abstain: 1 *Motion #18 postponed*

Motion #19: **Recess for 15 minutes**

Moved by: Peter Chadwick
 Seconded by: Johnny Zweig

Approved: (many ayes, one nay) *Motion #19 passes*

Goals for Mar 96

- We have one goal - Process D3 LB comments and forward D3.1 for sponsor ballot.

17.a Financial Report from Schaumburg meeting, by Jim McDonald

August 28 through August 31
 Marriott Hotel, Schaumburg Ill
 Number of Attendees: 31
 Host: Motorola

Cost

Meeting Rooms	0.00
Audio/Visual	2023.60
Catering Breaks	1667.32

Total	3691.92
Revenues	
Previous Meetings	0.00
Attendee Fees	3100.00
Host	591.92
Total	3691.92

Motion #20: **To approve the finances from the Schaumburg meeting.**

Moved by: Wim Diepstraten
 Seconded by: Wayne Moyers

Motion 20 Discussion: none

Approved: (no nays)

Motion #20 passes

16.2 PHY Group, by Dean Kawaguchi

Full PHY Group, by Dean Kawaguchi

1. Elect PHY Vice Chair.

- Peter Chadwick, nominated by Jim Renfro, seconded Mack Sullivan.
- Accepted unanimously.

2. Old Business

- a) Acceptance of minutes of last meeting: acceptance proposed
 Peter Chadwick, seconded Jan Boer. Accepted unanimously.
- b) **Duration field/multi-rate.**
 Brief discussion of the issue, straw poll on moving the duration field in the PLCP header.
 Results were 5, 2, 1 in favor.
- c) **PHY service primitives (clause 9)**
 We addressed all of the technical letter ballot comments on clause 9 of D2.0.

16 technical comments
 7 accepted
 9 rejected (2 from duration field issue)

Discussion on the comment by Michael Fischer on 9.3.5.2.3 to add: [The time between receipt of the last bit of the provided octet from the WM and the receipt of this primitive by the MAC entity shall be the sum of aRx_RF_Delay + aRx_PLCP_Delay.](#)

Motion: accept the comment.

Moved by Jim Renfro, seconded by Jan Boer
 PHY group vote: 3, 2, 3 - Motion passed by 50% but less than 75% with the chair breaking a tie.

Motion #21: **accept the comment.**

Moved by: The PHY Group
 Seconded by: Jan Boer

Motion 21 Discussion:

This comment was addressed to a section which is the receive side only.
 The service interface primitives are abstract and have no timing relationship with a real implementation, so what is the value of this definition? This delay must be compensated for when updating the TSF timer.
 The text changes proposed improve what was there, although the group didn't necessarily like the reasoning behind the suggestion.

Call the question by Chris Zegelin, second Jim Renfro (no nays)

Approved: 12 Opposed: 0 Abstain: 7 *Motion #21 passes*

Motion: accept the changes to clause 9 PHY Service Primitives as documented in the distributed draft text and comments resolution file for inclusion in D3.0.

- Moved by Dean Kawaguchi, seconded by Jan Boer
- PHY group vote: 6, 0, 2 Motion passes.

Motion #22: **accept the changes to clause 9 PHY Service Primitives as documented in the distributed draft text and comments resolution file for inclusion in D3.0.**

Moved by: The PHY Group
Seconded by: Jan Boer

Motion 22 Discussion: none

Approved: 16 Opposed: 0 Abstain: 3 *Motion #22 passes*

d) PHY MIB (clause 10)

We addressed all of the technical comments in clause 10, and added some new parameters.

- 8 technical comments
- 3 accepted
- 5 rejected (4 were obsolete)

Motion: accept the changes to clause 10 PHY MIB as documented in the draft text and comments resolution file for inclusion in D3.0.

- Moved by Dean Kawaguchi, seconded by Jan Boer
- PHY group vote: 7, 0, 1 Motion passes.

Motion #23: **accept the changes to clause 10 PHY MIB as documented in the draft text and comments resolution file for inclusion in D3.0.**

Moved by: The PHY Group
Seconded by: Wayne Moyers

Motion 23 Discussion: none

Approved: 17 Opposed: 0 Abstain: 2 *Motion #23 passes*

3. New Business

a) 3 Mbit/s presentation postponed due to Naftali's weather related absence.

Will be on March 1996 agenda.

b) FCC wish list.

Insufficient time remaining. Added to March 1996 agenda.

4. Agenda for March 1996

- Resolution of D3.0 letter ballot comments
- 3 Mbit/s informational presentation
- FCC wish list
- Conformance testing

FH PHY Group

Vice-Chair .

- Peter Chadwick, nominated by Dean Kawaguchi, seconded by Jim Renfro.
- FH PHY vote: 3 - 0 - 1.

Congestion after Hop

Jim McDonald raised the problem of collisions immediately after hopping. After discussion, it was

decided on a straw poll to recommend that after a hop had taken place, there would be a new back-off number chosen.

Motion: that the group recommend that the MAC group implement the above change. Moved by Jim Renfro, seconded by Peter Chadwick.

FH PHY vote: 3 - 0 - 2 Motion passes.

PICS Proforma

- Dean Kawaguchi introduced the PICS pro-forma table. After discussion, it was decided that where items related to the support of service primitives be changed from optional to mandatory. Format changes requested by Bob O'Hara would be implemented by Dean Kawaguchi.

- Motion in PHY group: Table the service primitives changes until March 1996 PHY meeting.

- Moved by Dean Kawaguchi, seconded Jan Boer

- PHY vote: 6, 0, 2 Motion passes.

Sect 11 as revised

- The changes voted in the November 1995 meeting did not appear in the D2.1 draft due to some mix-up in emails. The edited version was distributed in the FH meeting and reviewed. We implemented additional cleanup and MIB updates. The only significant technical change made was on CCA busy during hop.

Technical change: CCA Busy during Hop

- Motion: that the CCA should indicate "Busy" during a hop_time, and that hop_time should be a period of 224 μ s, starting from the time that the radio is commanded to change channel.

- Moved by Dean Kawaguchi, seconded Peter Chadwick

-FH PHY voted unanimous. Motion passes.

-PHY vote: 6, 0, 1 Motion passes.

Motion #24: **that the CCA should indicate "Busy" during a hop_time, and that hop_time should be a period of 224 μ s, starting from the time that the radio is commanded to change channel.**

Moved by: The PHY Group

Seconded by: Tom Baumgartner

Motion 24 Discussion: none

Approved: 19 Opposed: 0 Abstain: 1 **Motion #24 passes**

MIB Additions:

- aPreamble_Lngth

- aPLCP_Hdr_Lngth

- aMPDU_Lngth_Factor

- aPref_Max_MPDU_Frgmnt_Lngth

- Motion: To add this parameter in as a STATIC value of 400 octets.

- Moved by Dean Kawaguchi, seconded by Ron Mahany

- FH PHY vote: 4, 2, 0 motion passes with 50% but less than 75%

- PHY vote: 3, 0, 3 Motion passes.

Motion #25: **To add this parameter in as a STATIC value of 400 octets.**

Moved by: The PHY Group

Seconded by: Wayne Moyers

Motion 25 Discussion:

Against: doesn't belong in the MIB. An informative annex or not at all.

What is the MAC supposed to do with this? Default value for the MAC to use when selecting fragment size.

Against: This short a fragment size hurts multirate performance, the higher speed doesn't give much benefit.

In favour: to make sure that for an FH radio to be conformant, want to make sure that it works.

Call the question by Dean Kawaguchi, second Jim Renfro (no nays)

Approved: 2 Opposed: 16 Abstain: 1 ***Motion #25 fails***

Motion: Accept the ratified changes made at the January 1996 meeting to Clause 11 FH PHY on the edited text from the November 1995 meeting, as documented in the distributed draft text, for inclusion in D3.0.

- Moved by Dean Kawaguchi, seconded by Peter Chadwick

- FH PHY vote: 5, 0, 1 Motion passes.

- PHY vote: 8, 0, 0 Motion passes.

Motion #26: **Accept the ratified changes made at the January 1996 meeting to Clause 11 FH PHY on the edited text from the November 1995 meeting, as documented in the distributed draft text, for inclusion in D3.0.**

Moved by: The FH PHY Group

Seconded by: Peter Chadwick

Motion 26 Discussion: none

Approved: 17 Opposed: 0 Abstain: 1 ***Motion #26 passes***

Agenda for March 1996

- Resolve letter ballot comments

- Inclusion of France, Spain, Australia, etc.

DS PHY

Updated clause 12 with editorial changes and to be consistent with updated clauses 9 and 10.

Motion: Accept the changes made at the January 1996 meeting to Clause 12 DS PHY, as documented in the distributed draft text, for inclusion in D3.0.

- Moved by Jan Boer, seconded by John Fakatselis

- DS PHY vote: 4, 0, 0 Motion passes.

- PHY vote: 5, 0, 0 Motion passes.

Motion #27: **Accept the changes made at the January 1996 meeting to Clause 12 DS PHY, as documented in the distributed draft text, for inclusion in D3.0.**

Moved by: The DS PHY Group

Seconded by: Jan Boer

Motion 27 Discussion: none

Approved: 14 Opposed: 0 Abstain: 2 ***Motion #27 passes***

Finalized the PICS proforma for clause 12, available in document 96/13.

- Motion: Accept the changes in 96/13 for clause 12 PICS Proforma.

- Moved by Jan Boer, seconded by John Fakatselis

- DS PHY vote: 4, 0, 0 Motion passes

- PHY vote: 5, 0, 0 Motion passes.

Motion #28: **Accept the changes in 96/13 for clause 12 PICS Proforma.**

Moved by: The DS PHY Group
 Seconded by: Jan Boer

Motion 28 Discussion:

Approved: 11 Opposed: 0 Abstain: 5 *Motion #28 passes*

Discussion of DS conformance test spec.

Minutes in document 96/12.

Agenda for March 1996

- Comment processing
- Proposed outline for conformance test specification
- Proposed test bed for DS PHY

IR PHY

Wrote PICS Proforma for clause 13.

- Motion: Adopt the PICS Proforma for clause 13 as documented in the distributed file.
- Moved by Tom Baumgartner, seconded by Wayne Moyers.
- PHY vote: 7, 0, 0 Motion passes

Motion #29: PICS for 13

Moved by: The IR PHY Group
 Seconded by: Dean Kawaguchi

Motion 29 Discussion: none

Approved: 17 Opposed: 0 Abstain: 2 *Motion #29 passes*

Motion #17: That 802.11 create Draft D3 from D2.1 and adopted changes from this week and send D3 out for (regular, not confirmation) Letter Ballot per schedule passed out by Vic.

(was postponed till this moment)

Motion 17 Discussion (cont.): none

Approved: 20 Opposed: 0 Abstain: 0 *Motion #17 passes*

16.3 FCC Report - meeting didn't happen due to weather problems at the FCC

17. Unfinished Business**17.0 Miscellaneous**

17.1 Recap of Output Documents: Draft standard to regulatory bodies and liaison (D3)

17.2 Recap of Document Distribution: none

17.3 Next Meeting**Objectives for next meeting (in order of priority)**

- Resolve D3.0 letter ballot comments and prepare Draft for sponsor ballot
- Inclusion of hop tables for other countries (France , Spain, Australia)
- Tutorial to 802
- Conformance test

3 Mbit/s informational session
FCC wish list

Mailing date: one mailing only, Jan 25, mailed Feb 2nd.

17.4 Future Meetings: see chart. May in the USA would be good because there is worry about travel approve from US companies to Europe twice in a row, and good meeting attendance is important.

17.5 Other Intermediate Meetings: MAC, PHY ad-hoc groups start at 8:30 AM Monday in La Jolla

18. New Business:

18.1 Thanks to MaCOM for arranging an excellent meeting and not having it on the east coast.

19. Closure - meeting adjourned at 4:25 PM.

Tentative Meeting Schedule

Date	Month	Year	Place	Type	Location	Host
11-15	March	1996	La Jolla, CA	Plenary	Hyatt Regency	
13-16	May	1996	TBD	Inter	TBD	
8-12	July	1996	Netherlands	Plenary		
TBD	Sept	1996	TBD	Inter	TBD	
11-15	Nov	1996	Vancouver, BC	Plenary	Hotel Vancouver	
11-15	March	1997	Irvine, CA ?	Plenary	Irvine Marriot?	
7-11	July	1997	Lahaina, HI ?	Plenary	Hyatt Regency Maui ?	
10-14	Nov	1997	Vancouver, BC ?	Plenary	Hotel Vancouver?	

Appendix 1

Attendance list

Title and first name	Last name	status	Company	communications
Mr. DAVID	BAGBY	voter	Advanced Micro Devices david.bagby@amd.com	+1 408 749 5425
Mr. C. THOMAS	BAUMGARTNER	voter	Spectrix Corp. ctb8@aol.com	+1 847 317 1770
Mr. SIMON	BLACK	voter	Symbionics Networks Ltd sab@symbionics.co.uk	+44 1223 421025
Mr. JAN	BOER	voter	AT&T WCND Utrecht jan.boer@att.com	+31 3060 97483
Mr. PETER E.	CHADWICK	voter	GEC Plessey Semiconductors Inc. gecp.peterc@applelink.apple.com	+44 1793 518080
Mr. WIM	DIEPSTRATEN	voter	AT&T WCND Utrecht wim.diepstraten@att.com	+31 3060 97482
Mr. SCOTT	DOYLE		M/A-COM Inc. sbd@technet.macom.com	+1 508 656 2603
Mr. ROBERTS	EGRI		M/A-COM Inc. rge@technet.macom.com	+1 508 656 2795
Mr. DARWIN	ENGWER		XIRCOM dengwer@xircom.com	+1 415 691 2500
Mr. GREG	ENNIS	voter	+1 408 358 5544 gennis@netcom.com	
Mr. JOHN	FAKATSELIS	voter	HARRIS Corporation M/S 62A-028 jfakat01@ccmail.mis.semi.harris.com	+1 407 729 4733
Mr. MATHEW	FISCHER	voter	Advanced Micro Devices abl matt@brahms.amd.com	+1 408 749 5403
Mr. GEORGE	FISHEL		AMP Inc. grfishel@amp.com	+1 717 592 6161
Mr. ROLAND	FOURNIER	voter	Advanced Micro Devices roland.fournier@amd.com	+1 408 749 5439
Mr. IAN	GIFFORD	voter	M/A-COM Inc. giffordi@corp.macom.com	+1 508 442 4650
Mr. VICTOR	HAYES	voter	AT&T WCND Utrecht vic.hayes@att.com	+31 3060 97528
Ms. CAROLYN L.	HEIDE	voter	Spectrix Corp. 71041.3262@compuserve.com	+1 847 317 1770
Mr. DEAN M.	KAWAGUCHI	voter	Symbol Technologies Inc. deank@psd.symbol.com	+1 408 369 2629
Mr. BRIAN	KHABBAZ		M/A-COM Inc. khabbazb@corp.macom.com	+1 508 656 2910
Mr. ARTHUR	LASHBROOK		XIRCOM alashbro@xircom.com	+1 415 691 2500

Appendix 1

Attendance list

Title and first name	Last name	status	Company	communications
Mr. RONALD	MAHANY	voter	Norand Corporation mahanyrl@norand.com	+1 319 369 3552
Mr. JIM	McDONALD	voter	Motorola Inc. jim_mcdonald@wes.mot.com	+1 708 576 3169
Mr. WAYNE D.	MOYERS	voter	Wise Communications Inc wmoyers@wise.com	+1 408 338 7562
Mr. RAVI P.	NALAMATI		Digital Equipment Corp. nalamati@irocz.enet.dec.com	+1 508 486 5189
Mr. BOB	O'HARA	voter	Advanced Micro Devices bob.ohara@amd.com	+1 408 749 4952
Mr. MITSUJI	OKADA	voter	NEC Electronics Inc. mokada@asic.mtv.nec.com	+1 415 965 6549
Mr. AL	PETRICK	voter	HARRIS Semiconductor MS 58-96 apetrick@ccmail.mis.semi.harris.com	+1 407 729 4944
Mr. JAMES A.	RENFRO	voter	Raytheon Company james_a_renfro@ccmail.ed.ray.com	+1 508 490 1934
Mr. WILLIAM	ROBERTS		American Microsystems Inc. x6514 wroberts@poci.amis.com	+1 208 233 4690
Mr. CHANDOS	RYPINSKI	voter	LACE Inc. rypinski@netcom.com	+1 415 389 6659
Mr. ANIL K.	SANWALKA	voter	Neesus Datacom Consultants anil@interlog.com	+1 416 724 8127
Mr. THOMAS	SIEP	voter	Texas Instruments siep@ti.com	+1 214 995 3675
Mr. BERT	SULLAM		Seattle Silicon Corp bert@seasil.wa.com	+1 206 957 4422 x101
Mr. MACK	SULLIVAN	voter	Proxim Inc. mack@proxim.com	+1 415 960 1630
Mr. MIKE	TROMPOWER	voter	Aironet Wireless Comms. Inc. mtrom@aironet.com	+1 216 665 7920
Mr. TOM	TSOULOGIANNIS	voter	+1 416 299 1954 tomt@interlog.com	
Mr. SAROSH	VESUNA	voter	Symbol Technologies Inc. saroshv@psd.symbol.com	+1 408 369 2657
Ms. DONNA A.	WOZNICKI		Digital Equipment Corp. woznicki@lkg.mts.dec.com	+1 508 486 5085
Mr. CHRIS	ZEGELIN	voter	Symbol Technologies Inc. M.S. 160 369 2667 chrisz@psd.symbol.com	+1 408
Mr. JOHNNY	ZWEIG	voter	XIRCOM jzweig@xircom.com	+1 415 691 2500