Tentative Minutes of the IEEE P802.11 Working Group

Interim meeting
Oshawa, Ontario, Canada
May 9-12, 1994

Monday, May 9, 1994, 9:00 AM

The meeting was called to order at 8:40 AM by Vic Hayes, chairman IEEE P802.11[1)], in the chair. John McKown vice-chairman. The chair called for volunteers for temporary Secretary. C. A. Rypinski responded. The agenda document for this meeting is 802.11-94/92. Document distribution handled by Jon Rosdahl, attendance record by Leon Scaldeferri and copying by John McKown.

Submitted by C. A. Rypinski, extensive editing and formatting by Vic Hayes

Objectives for this meeting

MAC Group

- **Finalize Distributed Time Bounded Service**
- **Complete MAC /PHY interface**
  –If not done in May schedule is in jeopardy!

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- **MAC fragmentation decision**
- **Windowing decision**

Objectives for this meeting(continued)

MAC Group

- **Multi PHY rate impact exploration.**

- **Simulation results**
- **Deferred draft vs issues log cross check.**

PHY group

- **Decide values for PHY frame size and MPDU size**
- **Complete the MAC/PHY interface**
- **All subgroups will be editing text for draft standard**
- **Resolve Clear Channel Assessment issues at the subgroup level**
- **Resolve PHY Layer Control Headers**
- **Generate input to the MAC group on questions they have asked**

1. Opening

The chair took a quorum count. Finding 39 voting members present, and 55 required, no quorum was present. The Chair proceeded with the meeting on the assumption that no final action could be taken without a quorum but that the meeting should continue. Discussion on procedure without a quorum started.

Jagt: Motion to enable business to be transacted subject to ratification by quorum plenary.

McKown: Can't proceed in any way without quorum.

Chair proceeds without quorum. Intention to test for quorum later.

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

Back to the quorum issue. The chair announced that he, instructed by the last meeting, had asked all voters not present at he last meeting to voluntarily defer voting member status by agreeing to be considered to be a "sleeping voting member". As soon as they attended at a meeting at which they would still qualify for voter according to the 802 rules, they would have their voting right back. Dave Bagby presented objections to revocable voting status.

Short break for quorum probability estimate. Still not as required.

Chair Introduces host Storoshchuk.

1.2 Voting rights: Chair goes back to prepared plenary agenda. Voting rights: Chairs last count: 109 voting, 4 sleeping, 21 nearly voting members.

1.3 Attendance list, Registration: Chair called attention to the Attendance record handled by Leon Scaldeferri. Registration and meeting fee on hotel bill.

1.4 Logistics: HP LaserJet II in room 118 with K and E cartridge. Document distribution by Jon Rosdahl.

1.5 Other announcements

1.5.1 Document Distribution Chair gave reasons for mailing in electronic form. People were in general happy with the electronic distribution.

1.5.2 Metric dimensioning The IEEE Board of Directors adopted a statement of Metric Policy. The statement is as follows: To follow SI-based metric practice as detailed in IEEE Standard 268, American National Standard for Metric Practice, to express measured and calculated values of quantity in all IEEE publications including standards. The plan is for implementation by January 1, 1998, at the latest. Plans to update existing standards shall be developed no later than January 1, 1995

1.5.3 New IEEE publications The following are new IEEE publications: IEEE Standards Board, Bylaws, December 1993 and IEEE Standards, 1994 Operations manual,

1.5.4 Drafts on server IEEE allows (working) Draft standard on server, provided there is a password protection for members only. K Lynn will check possibilities.

1.5.5 Anti-trust American anti-trust laws prevent competitors to come together and fix prices. Standard committees are vulnerable in this regard with the major weakness resides in mentioning prices. The latter has happened in last MAC meeting regarding RT encryption. 802.11 Chair has asked IEEE Standards office for advice. The stated that Technical Committees were only responsible for technical part and have to make sure that the holder files his willingness for licensing, without discrimination and for a reasonable fee. The IEEE Standards Office will be further involved in dealing with assessment of "reasonable". IEEE standards office will provide tutorial at next meeting.

1.5.6 Intellectual property statements 802.11 Chair sent the signed statements to the IEEE office. We need to verify if all statements are available. Subgroups are requested to look this week if all material has been checked for IP statement availability. Chair had so far signed statements from NCR (AT&T), Spectrix, Apple (but misses the agreement to nondiscriminatory licensing and reasonable rates), Symbol Technologies, Motorola and Andromeda. Statements without signature were available from Norand, IBM, XIRCOM and Feher. A discussion ensued whether the statements must explicitly give patent numbers.--discussion extensive on positions, rules are difficult to interpret. Will also be covered in tutorial from IEEE Standards office.

Second break

IP (intellectual property) discussion continues--free use of patents escapes antitrust--but still cost of alternatives matters--costs are an inevitable factor

1.5.7 Conformance claims Discussion of published statements--must not claim conformance to any draft standards--difficulties with press interpretations-- Chair needs written evidence in order to take action.

2. Approval of the minutes of the previous meeting

2.1 Vancouver meeting, quorum count 46 -- no approval vote for prior meeting minutes

2.2 Matters arising from the minutes: none.

3. Reports

3.1 Report from the Executive Committee, by Vic Hayes

- approval of IRDA and IEC Liaison statements
- approval for NTIA comments

3.2 from editors report by Kerry Lynn. Schuessler, O'Hara, Ennis are new co-editors. Revised organization--revised document to be released-- Doc: 20b1--FYI: help from Dave Bagby on MAC acknowledged.

Jagt: on MAC-PHY interface primitives. Detail of these concealing substantive technical change which appears as editorial change. Lynn: just changing arrangement of items in TOC--O'Hara: no changes in TOC.

Chair rules that future agenda item is the time for discussion of technical issues involved.

Lynn: 068 FH and xx MAC PHY group documents on primitives in conflict to be resolved.

3.3 from simulators Kerry Lynn reports that work is in progress on simulation. Mathematica program on FTP server.

3.4 from MAC/PHY interface ad-hoc

3.5 financial report San Jose meeting by Wayne Moyers

collected via room charge: 46 @ $ 45.00	2,070.00
collected at registration by WiSE 59 @ $ 45,00, less petty cash expense)	2,763.32
Total receipts	4,833.32
Paid to hotel	4725.00

Excess funds ($ 108.32) carried over to next meeting. Approval at next meeting.

4. Registration of contributions

Numbers range from 78 to 105 defined. Refer to appendix two for the list.

5. Adoption of the Agenda Jagt:: Objections to possible discussion of MAC/PHY interface in combined group before taking it up in the PHY group. Changes to Doc: 68 belongs in PHY group, not in direct action of the FH group to MAC/PHY in plenary.

Point of Order Voting member objects to video taping of parts of meeting by attendee; who then suspends photography.

section 7 draft standard impacted. Chairman rules to end discussion and to resume it at later point.

Lunch break

Resume at 13:45 approx.

Chair calls meeting to order and makes quorum count--39--short.

Discussion of quorum requirements. Recount 50 then recount 49. McKown proposes that a quorum be defined by 50% of the average attendance (at plenary?).

Moved that we confirm as an assembly that can reach decisions for ratification at the next plenary--extensive discussion--much objection to temporary rule change--argument that chair has power to expedite progress may include quorum rule modification.

Motion to adjourn for subgroups to meet. Moved by: Larry van der Jagt, Seconded by: Paul .Struhsaker. passed by unanimous voice vote.

Group continues to sit--Storoshchuk offers test bed--few takers

Group dissolves.

Tuesday morning, May 10, 1994

A roll call performed in the various sub-group meetings revealed that the numbers of voters in the meeting rooms was 54 of the required 55. The registration list showed we would have 56 and some said the missing persons had already left. The Chair decided that he would no, any more seek for a quorum and the remainder of the week had to be worked on a recommendation production basis

Wednesday PM May 11, 1994

9. Opening The chair opens the meeting on 13:05 PM

9.1 Roll Call All present were invited to mention their name and affiliation.

9.2 Document list update John McKown announces that 45, 60, 67are missing and that the following papers will be added: 127, 128, 129, 130, 131, 132. Refer to appendix 2 for the titles.

Jon Rosdahl announces that the following papers are still in copying: 91, 99, 100, 101, 105, 113, 114.

The chair stresses that he needs magnetic versions of submissions.

9.3 Agenda adjustments Michael Fischer draws the attention on the fact that the "September meeting" already starts in August! The agenda item 6 from Monday will be dealt with before agenda item 10. In announcement we will deal with HIPERLAN, Editing requirements, Antitrust and IP requirements. The modified agenda is approved on 13:45 AM.

9.4 Announcements

9.4.1 HIPERLAN Larry Taylor from Apple Europe and chairman of the ETSI RES 10 architecture group introduces doc: 94/94, Radio Equipment and Systems (RES), High Performance Radio Local Area Network (HIPERLAN) - System Definition Document. The document specifies that they use the ISO MAC -- wholly distributed architecture contains:

. System coordination function
. extensions to wire networks using 48 bit addresses.
. security service sublayer
. forwarding
. "do not consider how to put signals on air" data transfer services
. Pwr management
. CAM channel access mechanism
. PHY with 3 or 4 20 Mbit/s channels. Uncontrolled conflicting system -- no reservation system.

Tobagian Rowe definitive paper.
ordered by quality of service of packets
The document will be published as technical report this summer--the plan is to have a definitive document for HIPERLAN protocols end of this year. The system will use the spectrum specified by a CEPT Recommendation, i. e. 150 MHz @ 5150 MHz for 20 Mbit/s data transfer rate per channel.

9.4.2 Editing requirements One of the members draws the attention to the requirement from the PAR to conform to other standards like: IEEE 802.2, ISO 10039, IEEE 802.1 A, B, D, F and IEEE 802.10. Vic Hayes will check the applicability of 802.2.

9.4.3 Anti Trust and Intellectual Property Vic reports that after the Monday meeting, he has had a telephone conversation with the IEEE staff. They will give us a briefing at Orlando. Their experience is that the Intellectual property issue is escalating in current standards work, especially our work seems to be loaded by IP. The contents of the IEEE standards manual is their first shot towards a process. We need to read what action is required. The IEEE Standards Board has just established a new committee on IP. However, they will support us and at the same time learn from us. The standards manual stipulates that we must give due consideration to trying to find ways to prevent specifying protected matter. Such consideration can either be documented in a letter to the Standards Board or in the minutes .

6. Unfinished Business (Left over from Monday)

6.1 Comment on updates of draft standard, 11-93/20 b0. One response from P. Brenner (O'Hara): Next revision will be b1 after July meeting. Pending section on dtbs -- text available just before July meeting. Where is 20b1? -- Not discussed in MAC group? What is status of b0? -- "tentative draft" b0 will be voted to become draft at July meeting--will not be screened for ISO compliance.--O'Hara. Changes still coming to editors--Ennis. Schuessler: Not wholesale approval/denialdocument used for check against closed issues. Also some text in there that should not be in and also omitted text. Motion on 20b0 in March moved but not voted -- R. White

6.2 Comment on NTIA report Committee volunteers: W. Moyers and C. Rypinski plus V. Hayes (automatic) -- no further volunteers. Group will meet over diner.

6.3 New operating procedures 11-94/102. Chair rules that this document give the operating procedures to be followed by the group. Main difference: changes in draft standard can be made by plenary motions and voting, seconding and moving by voters only at all levels in 802.11 meetings. Dave Bagby asks whether the chair meant to say should on page 2 para 2 line 3. The chair admits it had to be must. He will make the relevant update.

6.4 Liaison, ETSI 11-94/93. The chair requests a group to edit a response to the ETSI liaison. The same group as the regulatory matter will prepare the text.

10. MAC/PHY (interface) Issues

10.1 Report from the ad-hoc group -- J Schuessler gave the following report: Monday evening: Set of logical primitives. Four agreed at PLCP boundary as listed in 94-122 as necessary but not sufficient -- reported vote: 23-2 -- Educational session timing.

Larry van der Jagt -- why not start with those in 20b0 passed by plenary at March meeting.?

Schuessler/Dean Kawaguchi: We decided in hall to start this way. It was the sense of the meeting that these were suitable.

Larry van der Jagt: Locally chosen primitives are not necessarily ISO compliant which those voted upon -- approach was what was needed.

Group on MAC-PHY interface to meet 8-10 PM

10.2 DTE/DCE interface issue 12.2A Issue closed at Wednesday PM session with a Recommend that: DTE/DCE interface be defined and exposable and that this interface be between the medium independent PHY layer and PHY medium dependent layer. Reported vote: 23-0-2.

Schuessler: recommends open issue, answer no and close.

Larry van der Jagt: recommends carry in standard as TBD. Came out as result of filtering issues for pending and compatibility. 'New issues can be closed by 33% of voting members at interim'

Motion #1 : **that we recommend to plenary that the chapter on the DTE/DCE interface shall contain the text "for further study" in our first draft standard.**

Moved by: Larry van der Jagt
Seconded by: Schuessler.

Unanimous voice vote to call question.

Approved: 34 Opposed: 0 Abstain: 0 ***Motion #1 passes as Recommendation***

Break and resume

Announcements O'Hara: Paper: "Knobs, Sliders and Dials" -- definition of managed information in 802.11 -- request for assistance in coauthoring the paper for presentation at July

High Speed PHY meeting at 8 PM in board room 121 -- W. Moyers

Issue 18.1 How MAC get PHY timings Should the MAC work equally well at all Phy data rates? Schuessler: Defer until packet size dealt with.

10.3 Packet length Jim McDonald moves that PHY will provide an indication of the maximum packet length to the MAC. (no second.....

For the 1 Mbit/s 2.4 GHz FH PHY, the maximum length shall always be greater than or equal to 400 octets.

If a single length MPDU is demanded by the MAC group this maximum MPDU length shall be 400 octets for the 1 Mbit/s 2.4 GHz PHY.

(3.2 ms frame for interleaving with microwave oven) purpose to keep open the possibility of different sizes for other environments.

The DS PHY shall be capable of carrying 2000 octets. In certain environments it may be necessary to set the limit at 500 octets. The DS PHY recommends that, or alternatively, the MAC will DS PHY capable of operating with payloads of 2048 octets

Certain environments we may limit to 512 octet

Max payload size is managed object within ESS

or the MAC may want to implement fragmented

Larry van der Jagt: Functional Requirement says must provide 99.9% reliability with defined coverage of the network.

Samdahl: It is the intention of the IR PHY group to develop PHYs for packet sizes of the order of 2000 octets.

Extensive discussion follows on radio and PHY requirements particularly based on gaps between microwave oven transmit pulses --

Consideration of growth in lengths from protocol header addition (74 octets max according to Rosdahl--Novell) -- IR more benign.

D Bagby: establishes all given maximums are at MAC/PHY boundary.

Rypinski since maximums from PHY limits are so large, the maximum is determined by frequency of access required for TBS connection. This will result in limits smaller than the larger sizes.

Geiger: fragmentation is a MAC problem having nothing to do with PHY limits

O'Hara: based on numbers, fragmentation is PHY problem

MacDonald: assumption that ovens are ON a small part of the time. Customers know it. Customers will ask for interference tests. Duty cycle not relevant. Basic functionality in presence of oven is required.

Discussion of size tradeoffs and constraints

Mahany PAR does not refer to isochronous services but does refer to mobile services

Motion #2 : **That the number that should be used by the MAC group in their studies should be based on an environment in which the PHY delivers MPDUs in the presence of one microwave oven interferer with a 0.1 MPDU loss rate on first try.**

Moved by: Larry van der Jagt
Seconded by: W. Moyers -- Chair limits discussion to 2 min/speaker

Kawaguchi: oven environment with random start will lose 40%

Motion to amend ***to amend first line "number" to "number per PHY"***

Moved by: McKown
Seconded by: White

O'Hara calls question unanimous on voice vote minus one.

Vote: 21-6-6 **Amendment passed**

Motion #2 as amended **That the number per PHY that should be used by the MAC group in their studies should be based on an environment in which the PHY delivers MPDUs in the presence of one microwave oven interferer with a 10^{-1} MPDU loss rate on first try.**

Bagby calls question 2nd Terry -- Motion fails on near unanimous voice vote

Motion to amend ***to amend "which is 30 dB greater than the desired signal at the receiver over 40% of the whole band"***

Moved by: O'Hara
Seconded by: Larry van der Jagt

Peter Chadwick calls question on amendment:

Vote: 6-15-13 **motion to amend fails**

Motion to amend **"The test shall be conducted such that the microwave oven's RF output of a normal new condition 700 watt oven shall lie within the passband of the radio link being evaluated at a fixed test distance of four meters from the radio antenna without intervening shielding"**

Moved by: Moyers
Seconded by: no second

O'Hara: calls question on main motion: many aye and a few nays on voice vote

Approved: 15 Opposed: 15 Abstain: 6 ***Motion #2 fails*** (declared technical by Chair)

11. PHY issues there were none

12. MAC issues there were none

13. Adjourn meeting adjourned 5:51 PM

Thursday afternoon May 12, 1994

The acting Secretary was not present at the opening of the meeting. The notes of Ryan Tze are incorporate from the start until 13:20.

14. Opening Chair opened the meeting at 13:00

14.1 Announcements

Dave Bagby requested a change of the agenda order due to his, and Bob O'Hara's, flight schedule. He also said that it is a formal MAC reporting format.

15.2 MAC group Report by Dave Bagby

May '94 MAC group report

Unbelievable Coincidence..

- A bunch of us just happened to be in Oshawa at the same hotel (several of us thought an 802.11 meeting would be held, but we were **mistaken), so we hung around for a few days and kicked around some MAC topics for grins... here is what we talked about.**

MAC agenda from Mar

- DTBS improvement finalization.
- Complete M/P interface
  - If not done in May schedule is in jeopardy!
  - MAC fragmentation decision
  - Windowing decision
  - Multi PHY rate impact exploration.
- Simulation results now what simulator issue resolved.
- Deferred draft vs issues log cross check.
- MAC schedule review for progress check.

Monday:

- agenda approval
  - informal, no quorum
- minutes approval
  - not done, no quorum
- Simulation group report
  - no progress to report

- Mac editing group report
  - no report, no quorum, believe that decisions from March incorporated in draft.
- Draft vs issues log cross check.
  - Due diligence - check foundation against closed issues to identify areas for correction.
    - » hit list created - doc 94/??? (get num from Vic)
    - » subjects assigned as action items
    - » results due back to editors by ?????

Tuesday

- Multi PHY rate impact exploration.
  - 94/119
  - 94/115
  - Much discussion
  - no consensus achieved.

Wednesday

- DTBS improvement finalization (mar motions)
  - Motion: To add 'distrib time bounded' service to the foundation MAC and to determine by the end of the May 1994 meeting whether one or both of the TBSs will remain in the standard.
    - » Approved: 25-1-5
    - » Plenary vote: 39-0-9
  - Motion: To add 'priority access mechanism' to the DCF of the 802.11 MAC.
    - » MAC vote 17-2-9
    - » Plenary vote: 38-0-9
  - Motion: To use the mechanisms proposed in doc 58 as a basis for the "priority access method" to be included in the DCF, and to **further investigate its sensitivity to relevant parameters.**
    - » Postponed to definite time (May 94) 19-4-4
    - » Motion Not completed at this meeting.

Wednesday

- Papers 94/116, 94/121 presentation and panel discussion.
- Poll for sense of group at end of panel discussion to be reported to July plenary.
  - Dual vote notation: all voting / voting members
  - Both: 0 / 0
  - One = Current TB service 1 / 1
  - One = Dist TB service 12 / 9
  - "one" sub-total: 13 / 10
  - Abstains: 5 / 5
- rec: DTB as the one TB service.

Thursday (morn)

- March MAC fragmentation decision
- Moved: 802.11 agrees to add fragmentation functionality to the MAC or a convergence layer when it is shown to be required by PHY **frame length limitations or performance simulations and/or empirical data.**
  - Laid on table 3/9/94 with intent to discuss in joint MAC/PHY mtg before taking back up again in the MAC group...
  - Since joint M/P after MAC mtg, was pushed to May agenda.

The Layer Overhead Picture:

Variable Definitions:

- ULO: Upper Layer Overhead.
  - MAX overhead from all known upper layers.
  - Value = 74 octets.
- LLCO: LLC Overhead

  - MAX overhead of LLC layers
  - Value = 8 octets.
- RO: Routing Overhead
  - MAX overhead to support Source Rout and Transparent
  - Value = 30 octets.
- MACO: MAC Frame Header Overhead
  - Size from 802.11 draft document.
  - Value automatically incorporated in calculations as draft changes.
  - Value in octets.

Variable Definitions (all in octets):

- ALDU: Application Layer Data Unit.
  - Value in octets.
- MSDU: MAC Service Data Unit.
  - The size of the data transferred between LLC and MAC layers.
  - Value in octets.
- MPDU: MAC Protocol Data Unit.
  - The size of the data transferred between the MAC and PHY layers.
  - Value in octets.

Our Requirement:

- Determine value for MSDU.
- Determine value for MPDU.

Frag decision:

- For 802.11 MAC include fragmentation functionality.
- 12, 1, 2

MSDU discussion:

- MSDU size:
- favorite, can live with, never
- 1.2k (min working): 0, 1, 12
- 1.5 (enet): 0, 9, 2
- 2K (fits phy info): 12, 17, 0
- 4K (token): 5, 13, 2
- note: numbers are approx. value, overhead to be added
- total number in room = 17
- Recommendation is 2k.

MPDU limits discussion:

- The Phy supported MPDU range shall be fixed in each PHY specification. Two numbers will be speced, the "sunny" number and the "**rainy" number.**
  - phy optimistic #
    - » clear day
  - and phy pessi #
    - » rainy day
- For having this in all phy specs: 13, 0, 1

Active MPDU value - MIB variable

- managed object.
- sets current active maximum MPDU value in use for a BSS.
  - variable is per station.
  - value of variable is consistant across a BSS.
  - remember the value is a maximum.
- can be inquired.

- constrained to values between sunny and rainy.
- range limits also inquireable but not settable.
- rec for these: 11, 1, 1

Default value of "active MPDU":

- sunny value: 8
- rainy value: 3
- Rec: Sunny value

Who can set "active max mpdu" mib variable

- Set via MAC mgt, phy can not set it:
- Vote: 11, 1, 4

L Jagt: is this management of phy?. --O'Hara: knob is how but not why--

for MPDU size floor -- vote: 9-0-4

Below floor is non-compliant

Floor value: gives values for preferred-acceptable-reject--attendee straw poll for various values.

Recommend: 256 octets (second choice = 128 octets)

Who can set "active MAX MPDU" MIB variable. As per result of the earlier vote (11,1,4). --Set in via MAC Management, PHY cannot.

L Jagt: Is MAC Management managing the PHY? O'Hara: management provides mechanism to turn that. .Jagt: MAC management is actually the system management. System management somehow doesn't know and somehow comes to the management in the MAC.

D. Bagby: If MSDU < MPDU must fragment. then can set the equation true to false and vice versa. Jagt: worried about the overall structure and the path. It should also be the capability of the system come to layer management interface to decide the path.

Bagby continues the report:

MPDU Floor:

- A lower limit on MPDU size is set. This shall be called MPDU_floor.
  - Any MPDU value above MPDU_floor is fine.
  - Any MPDU value above MSDU is BOTH fine AND superfluous.
  - PHY proposals with MPDUs < MPDU_floor can NOT be an 802.11 phy.
  - Value is in octets.
- vote for floor existence: 9, 0, 4

MPDU Floor:

- Floor value:

	fav, ok, never
– 128:	5, 9, 3
– 256:	5, 11, 0
– 512:	0, 9, 4
– 1024:	0, 5, 9

- rec = 256

Thursday (morn)

- Windowing decision
  - Dependent on fragmentation decision
  - Not enough understanding / communication on subject yet.
  - Deferred to July by group consensus
- 94/107

- 94/106
- MAC report review
  – moot, no quorum, no plenary this week, informational only...

Other subjects pushed to July.

- Formal Adoption of recommendations
- 94/22 - The RT Encryption Algorithm from March

R Tze: encryption moved to July also.

MAC group report

- That's all folks... See you when Micky's big hand is on the ...

Jagt:. Asked for a brief on the windowing issue. Dave: How many fragments you send before you send the ACK. Currently, it is 1. This means that there is no window. If you want to ack each fragment, so each hit is a packet got hit.

Never, windowing decision, dependent on fragmentation decision, not enough understanding/communication on subject

W Diepstraten: Question for Dave. If one of the fragments is in error, do I have to send the MPDU again. Why is fragment useful?

Bagby: Work for discussion now and then. No personal opinion yet.

Bagby: All fragmentation discussion was done this morning.

Bagby:. Ask for a room Monday noon at the next plenary.. Would like to go through the MAC report the 2nd time for people to get up to speed.

Bagby requests to have the registration of the papers be done before the meeting: Vic Hayes: I always ask them to bring them in early. but nobody is doing that. Bagby: suggest to fedex paper on Friday to Vic and don't carry it.

Windowing depends on implementations--

L Jagt: explain windowing?

Bagby:: windowing size of 1 preferred--Windowing has to do with number of frags passed before ack.

Diepstraten: Are these decisions? Bagby I report what I heard.

Meeting schedule for next (plenary) meeting

Meeting to start at 10:30 am Monday morning

PHY group to meet at 8:30 am

15.1 MAC/PHY interface ad-hoc group Schuessler report on the MAC-PHY interface group

report on 8-10 PM wed night

a) The physical service unit of the PHY primitive set is one octet

vote: 8-10-4

b) Take physical service data unit of the PHY primitive set is one MPDU vote: 10-6-6

Should one of these succeed, it is the intent to recommend this be reflected in Draft

Motion #3: **that the MAC/PHY interface ad hoc adopt as their direction to add definition to the data parameters that exist in doc: 60 (i.e. draft standard) so that these primitives are used.-**

Moved by: Schuessler
Seconded by: O'Hara

Motion Discussion: none

Approved: 7 Opposed: 4 Abstain: 8 ***Motion #3 passes as recommendation***

14.2 Document list update

14.3 Agenda adjustments

Chair: Shows Agenda and hearing no objection adopts it

15. Reports

15.3 PHY group report -- L. van der Jagt

Larry van der Jagt: reports agenda accepted to hear papers on packet size, interference and channel stability-- charged ad hoc groups with coming up with individual answers.

Ad hoc papers are snapshots of where they are--not decisions or selections

15.1.3 IR ad hoc group meeting report -- R. Samdahl

Goals

to choose one encoding technique and one modulation for carrier PHY and to create templates for the two PHY techniques (carrier and baseband).

to select bit rates for each PHY technique

to decide common values for PHY frame size and MPDU size

to start two draft PHY standards for selected techniques

to resolve clear channel assessment issues

resolve PHY layer control headers

respond to questions from MAC group

six papers presented

95/96/97--R. Valadas: template, preliminary PMD, performance data

118 -- H. Kindl -- device data

125 -- K. Feher --FQPSK

126 -- K-C Chen -- Template parameters 4-ary ppm

Motions passed at the March IR PHY meeting

the group adopts the following IR PHY structure: from 0-5 MHz is reserved for baseband, 5-15 MHz reserved for coexistence, 15-30 MHz is reserved for multi-carrier.

that IR PHY will adopt one or more of the following rates: 1, 2, 4 and 10 Mbit/s

Motions presented for this meeting

Motion #4: **that the IR PHY subcommittee produce two PHY definitions:**
one for baseband DC to 5 Mhz, and
one for carrier modulated operation from 15-30 MHz,
subject to provability of the mutual non-interference of the two PHY definitions and reserving a coexistence band from 5-15 MHz.

Moved by: R Samdahl
Seconded by: Barry Dobyns

Motion Discussion: none

Approved: 23 Opposed: 0 Abstain: 6 ***Motion #4 passes as Recommendation***

Motion #5: **that IR PHY adopts FQPSK as modulation format for carrier modulated IR communications**

Moved by: R Samdahl
Seconded by: Barry Dobyns

Motion Discussion: none

Approved: 12 Opposed: 5 Abstain: 12 ***Motion #5 fails (75 % required)***

Motion #6: **that the IR PHY subcommittee adopt as its baseband encoding technique, 16 ppm for the 1 Mbit/s bitrate, and 4 ppm for the 2 Mbit/s bitrate, with all conforming receivers required to operate at both bit rates, and all conforming transmitters required to operate at the 1 Mbit/s rate.**

Moved by: R. Samdahl
Seconded by: Barry Dobyns

Motion Discussion: none

Approved: 26 Opposed: 0 Abstain: 6 ***Motion #6 passes as Recommendation***

rate change motivated by difference in battery drain not difference in performance

Motion #7: **Motion: that the IR PHY subcommittee has specifically rejected all other PHY proposals**

vote not recorded

Motion #8: **that the carrier modulated system will be capable to operate at 4 Mbit/s and 10 Mbit/s**

Moved by: R. Samdahl
Seconded by: Barry Dobyns

Motion Discussion: none

Approved: 22 Opposed: 0 Abstain: 9 ***Motion #8 passes as Recommendation***

Additional IR group motions presented in report:

Ref P802.11-94/92r,

page 2, frame 3: it is the intention of the IR PHY subcommittee to develop standards for PHY which can deliver frames whose maximum size is on the order of 2,000 octets including PHY specific overhead.

that the IR PHY accept p802.11-94/130 as the working template for the baseband IR physical layer specification.

the IR PHY accept P802.11-94/131 as the working template for the modulated IR physical layer specification.

15.1.2 DS ad hoc PHY group -- Report by Jan Boer

Discussion subjects:

- provision for antenna diversity

- max packet size

- opened issue on channel set to meet FCC, ETSI New bands

- discussion on TX mask

- discussion on CCA--how to specify and test

- next meeting to close remaining two subissues -- work on Direct Sequence draft standard

15.1.3 FH ad hoc PHY group -- Report by Jim McDonald

Peter Chadwick resigned as chair. Thanks for service

new chair Jim McDonald

Motion on max size MPDU:

The PHY will provide an indication of the max packet length to the MAC for the 1 or 2 Mbit/s PHY.

no vote recorded

Open issues

CCA, Bit stuffing block size , state machine collision recovery, multiple rates , state machine resolution, TX power control, PMD parameters, text edit in PLCP format, MIB, PHY lme

Killer patterns

Bit stuffing selected size frame TBD

Motion group adopts contribution 069

Schedule--resolve all open issues in July meeting--complete text edit in September meeting

L Jagt: draft on agenda for next plenary meeting

15.4 Regulations group

Hayes: He is chair of this Regulations Committee because no one else was willing to do it.

J. McKown takes over as temporary chair from Vic Hayes

Hayes: explains plan of NTIA to reassign frequences at low end of 2.4 GHz ISM band--reply letter distributed

Motion #8	**that the 802.11 chair takes appropriate action to file the comments to the NOI of the NTIA as proposed in Doc. 133**
Moved by:	V Hayes
Seconded by:	P Chadwick

Motion Discussion: none

Approved: 29 Opposed: 0 Abstain: x ***Motion #8 passes as recommendation***

15.5 Editors Liaison to ETSI STC RES 10

Hayes: explains ETSI letter--reads part of distributed response letter

Motion #9:	***that the 802.11 chair take the appropriate action to send the liaison letter as proposed in doc 134.***
Moved by:	V. Hayes
Seconded by:	Chadwick

Motion Discussion:

modified letter to delete last para with "looking forward to your response.." amendment accepted by mover and affirmed by 2nd.

Approved: 30 Opposed: 0 Abstain: 0 ***Motion #9 passes as recommendation***

McKown returns chair to Vic Hayes

16. Unfinished business

16.1 Recap of output documents

Liaison statement

NTIA Comments

16.2 Recap of document distribution

16.3 Next Meeting

*** Objectives for next meeting** to be taken from the reports

*** Mailing Dates: May 20 and June 13**

16.5 Future Meetings

Chair shows schedule for future plenary and intermediate meetings

Jan 95 meeting at San Jose accepted

16.4 Other Intermediate Meetings required?

17 New business

17.1 MAC management

Motion #10 **that the chair of 802.11 be authorized and directed to submit a request for an "object identifier arc" to the 802 Executive Committee in accordance with para C3 of IEEE 802.1f--1993**

Moved by: B. O'Hara
Seconded by: L. van der Jagt

Motion Discussion: none

Approved: 20 Opposed: 0 Abstain: 6 ***Motion #10 passes as recommendation***

Motion #11 **that the document 94-98 be adopted as a ss a work in progress for the framework of the MIB description.**

Moved by: B. O'Hara
Seconded by: E. Geiger

Motion Discussion: none

Approved: 20 Opposed: 0 Abstain: 6 ***Motion #11 passes as recommendation***

17.2 Quorum

Motion #12 **that the 802.11 Committee require an rsvp of voting members one week before each meeting, and if the rsvp's do not add up to a quorum that the meeting be cancelled.**

Moved by: by J Rackowitz Amendment to change motion to read (friendly):

that the chair is empowered and instructed to declare a quorum at the beginning of a meeting

Moved by: B Buaas no second, no vote

friendly amendment by L. van der Jagt:

Motion #12 as amended **that this body charges the chair to find a solution to the quorum problem at intermediate meetings by the next plenary session**

Seconded by: E. Geiger

Motion Discussion: none

Approved: 27 Opposed: 0 Abstain: 0 ***Motion #12 passes as recommendation***

18. Closure Submitted by C. A. Rypinski--Last edit on 15 May

Tentative Meeting Schedule

Date	Month	Year	Place	Type	Location	Host
11-15	July	1994	Orlando, FL	Plenary	Walt Disney Swan	
29/8-1 Sept		1994	San Antonio, TX	Inter	Marriott Rivercenter	Digital Ocean
7-11	Nov	1994	Incline Village, NV	Plenary	Hyatt Regency, Lake Tahoe	
9-12	Jan	1995	San Jose	Inter	LeBaron	WiSE & Tetherless
6-10	Mar	1995	West Palm Bch, FL	Plenary	Ramada	
8-11	May	1995	Utah	Inter	Open	Novell & Dayna
10-14	July	1995	Maui, HI	Plenary	Hyatt Regency	
TBD	Sept	1995	TBD	Inter	Open	
6-10	Nov	1995	Montreal, PQ	Plenary	Queen Elizabeth Hotel	
11-15	March	1996	La Jolla	Plenary	Hyatt Regency	
8-12	July	1996	Netherlands	Plenary	?	
11-15	Nov	1996	Vancouver BC	Plenary	Hotel Vancouver	

Appendix 1

Attendance list

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Appendix 1
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Appendix 2

Document list

-93/20b0	4	Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications
-94/60	X	Functional MAC/PHY interface, a MAC view (Wim Diepstraten, AT&T Global Information Solutions)
-94/66		Sectored Receivers for Indoor Wireless Optical Communication Systems (Rui Jorge Morais Tomaz Valadas, University of Aveiro
-94/67	X	2 Mbit/s Frequency hopping PHY proposal (Juan Grau, Proxim)
-94/71	X	FQPSK-Siemens components for EXIRLAN Infrared (IR), Wireless 802.11 Radio, other European, American and International Standards (Werner Just, Helmut Kindl, Larry Sisken - Siemens)
-94/74	X	Performance of FQPSK and coherent QPSK modulations in indoor PCS communications environment with time delay spread (Dr. Patrick S.K. Leung, Victoria Univ. of Technology - Australia)
-94/75	X	Intellectual Property Statement of Digcom, Inc. (Kamilo Fehrer)
-94/81	F	Recipe for Edittors (Bob O'Hara, AMD)
- 94/82	M	Tentative minutes of theMAC group meetings held at Vancouver, B.C. Canada, March 7-12, 1994
-94/83	F	Tentative minutes of the Full WG meetings held at Vancouver, B.C. Canada, March 7-12, 1994
-94/84	P	Preliminary List of Static Elements for the Common PHY MIB (Michael Fischer, Digital Ocean)
-94/85	P	Tentative minutes of the PHY group meetings held at Vancouver, B.C. Canada, March 7-12, 1994
-94/86	P	Tentative minutes of the PHY-IR ad-hoc group meetings held at Vancouver, B.C. Canada, March 7-12, 1994
-94/87	P	Tentative minutes of the PHY-DS ad-hoc group meetings held at Vancouver, B.C. Canada, March 7-12, 1994
-94/88	P	Tentative minutes of the PHY-FH ad-hoc group meetings held at Vancouver, B.C. Canada, March 7-12, 1994
-94/89	X	Tentative minutes of the PHY-Higher-rate-FH ad-hoc group meetings held at Vancouver, B.C. Canada, March 7-12, 1994
-94/90	I	Tentative minutes of the MAC/PHY Interface ad-hoc group meetings held at Vancouver, B.C. Canada, March 7-12, 1994
-94/91	F	Darwinisme in the ISM band (Jim Lovette Apple)

Appendix 2

Document list

-94/92	F	Tentative agenda for the Full Working Group session of meetings May 9-12, 1994, Oshawa.
-94/93	F	Liaison from ETSI RES10
-94/94	M	Document from ETSI RES10: Radio Equipment and Systems (RES), High Performance Radio Local Area Network (HIPERLAN) - System Definition Document
-94/95	s	IR PHY Template (Moreira, Lomba, Aguiar, Valadas and Olivaira Duarte, University of Aveiro)
-94/96	s	IR P HY Proposal (Moreira, Lomba, Aguiar, Valadas and Olivaira Duarte, University of Aveiro)
-94/97	s	Performance Evaluation of the IR PHY Proposal (Moreira, Sousa, Aguiar, Valadas and Olivaira Duarte, University of Aveiro)
-94/98	s	Knobs, Dials and Sliders - or - the Management Information Base (Bob O'Hara, AMD)
-94/99	s?	Venue for September meeting
-94/100	M	Comments on the DFWMAC (Tomoki Ohsawa, Royal Institute of Sweden)
-94/101	M	Bridging functionality for Medium Access Control Sublayer ---applied to Distributed Foundation Wireless Medium Access Control (Tomoki Ohsawa, Royal Institute of Sweden)
-94/102	s	Procedures of IEEE P802.11
-94/103	s	Proposed Revision to 94/68 Section 3 - FHSS PLCP Sublayer (D. Kawaguchi, Symbol Technologies and Ed Geiger, Apple)
-94/104	s	32-bit CRC Performance with burst errors and proposed FH packet formatting (D. Kawaguchi, Symbol Technologies)
-94/105	X	Proposed Text for Carrier Sense Procedure in FH Draft Section 3 (D. Kawaguchi, Symbol Technologies)
-94/106	s	Transmitter Priority in the MAC Layer (Rick White, Motorola)
-94/106a	s	Slides for 94/106
-94/107	s	Fragmentation Summary (Rick White, Motorola)
-94/108	s	Sharing Spectrum with Microwave Ovens (Rick White, Motorola)
-94/109	P	2.4 GHz max packet or frame length (Jim MacDonald, Motorola)
-94/110	P	Proposal for 2.4 GHZ CCA proces (Jim MacDonald, Motorola)
-94/111	P	Recommendations for mod for wording in 68 (Jim MacDonald, Motorola)

Appendix 2

Document list

-94/112	X	rf spec d (Jim MacDonald, Motorola)
-94/113	X	rf spec e (Jim MacDonald, Motorola)
-94/114	X	rf spec f (Jim MacDonald, Motorola)
-94/115	s	MAC issues for supporting a dual rate PHY (Hilton Hong, Proxim)
-94/115a	s	Slides for 94/115
-94/116	M	Evaluation of priority mechanisme and WINTech etiquette compatibility (Wim Diepstraten, AT&T GIS)
-94/117	P	Packet length and performance for the DS PHY (Jan Boer, AT&T GIS)
-94/118	P	Infra red components, characteristics for EXIRLAN FQPSK and other wireless systems (Helmut Kindl, Siemens)
-94/119	I	Gear Shifting Proposal (Pablo Brenner and Michael Rothenberg, LANNAIR)
-94/120	M	Tutorial on the foundation MAC frame delivery and relay assumptions (Wim Diepstraten, AT&T GIS)
-94/121	M	Review of distributed timebounded servic es (Tim Phipps, Symbionics)
-94/122	I	Text changes to 68 re MAC/PHY(Ed Geiger, Apple)
-94/123	P	Text changes to 68 re FH (Ed Geiger, Apple)
-94/124	I	Physical definitions for the interframe spacing (Chris, Symbol Tech
-94/125	PI R	Infra-red EXIRLAN (Kamilo)
-94/126	P	Template parameters of 4-ary PPM IR PHY (K.C. Chen, H.K.Luand T.H. Tsaur, NTHU)
-94/127	s	Packet length issues based on RF media considerations (Ron Mahany, Norand)
-94/127a	s	Slides for 94/127
-94/128	s	Preamble modification for improved selection diversity (Ron Mahany, Norand)
-94/128a	s	slides for 94/128
-94/129		Motion to adopt FH PHY Packet Formatting to minimize data DC offset
-94/130		
-94/131		
-94/132		
-94/133		Liaison letter to ETSI
-94/134		Comment on NTIA Report, Regulations committee draft
-94/135		Tentative minutes to the High data rate FH PHY group