IEEE P802.11
Wireless LANs

Tentative Minutes of the IEEE P802.11 Full Working Group

Hyatt Regency Hotel, Albuquerque, NM

6-10 March 2000

Monday, 6 March Opening Session IEEE P802.11

1.1 Opening of Session

Meeting called to order by Vic Hayes in the Chair at 1305 hrs. Agenda of 61st session of 802.11 is in doc.: IEEE P802.11-00/026-r2 (archive file 0026-r2-8W-Tentative-Agenda-Mar00.ppt).

Objectives for this meeting:

- ~~process TGd recirculation ballot results~~ (deleted since TGd incomplete so ballot not done)
- Prepare draft 802.11d for recirculation
- work on 802.11b-cor1 and submit to Sponsor Ballot
- submit PARs Enh. MAC and IAPP to ExCom, other PARs where necessary
- find (new) / elect officers
- send letters to liaison groups and to regulatory agencies as needed

1.2 Secretary, Document Officer, Attendance Book Officer

David Skellern, Secretary[1)], is present and ready to take the minutes.
Harry Worstel, Document Officer
Dennis Kuehara, Attendance Book Officer

1.3 Roll Call

The 68 people in the room introduced themselves.

[1)T] The officers of the Working Group are:

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1.4 Voting Rights

Vic Hayes summarised the regulations regarding voting rights.

(a) Participation in debates, moving and seconding, is only permitted by voting members, in all 802.11 meetings (at all levels of Plenary and Working Group).
- Chairs may permit observers to participate in debate
- In study groups all attendees have voting rights.

(b) To become a voting member and to maintain voting member status:
- Participate in at least 2 out of 4 consecutive plenary meetings. An initial non-voting member obtains voting rights at the third meeting.
  - One interim may be substituted for a plenary
- Participation in at least 75% of each meeting, in the room
  - Voting members will get a token to be used at votes

(c) All members have voting rights at task group meetings

(d) Voting rights may be lost:
- After failing to pay the conference fee
- After missing two out of three consecutive letter ballots

(e) Current member status:
- Voting members 82 at the beginning of this meeting
- Nearly voting members 15
- Aspiring voting members 68

1.5 Attendance List; Registration

- Attendance List: The attendance list has to be recorded for voting membership registration. It was circulated with Dennis Kuehara supervising.

1.6 Logistics

(a) Breaks: Coffee breaks are listed in the Agenda for 1000 and 1500. There is continental breakfast free for registered attendees. Lunches at members own expense from 1200-1300.

(b) Document copying, submission and distribution:
- Printing is available through the IEEE office.
- Document distribution: Dissemination of documentation is via electronic file distribution. Two mediums only will be used. They are 1) 802.11 network and 2) flash memory cards.
- All files must use the IEEE P802.11 templates for Word documents and PowerPoint. Vic Hayes explained how to properly name and enter information into the documents including the document information, headers and footers. For presentations it is necessary to view header and footer, and slide master and update the date, name and document number.
- Documents must be available before the agenda item is presented.

1.7 IEEE Patent Policy

Vic Hayes, 802.11 Chair explained the IEEE Patent Policy as per Clause 5 of the IEEE Standards Board Bylaws and per Clause 6.3 of the IEEE Standards Operations Manual. He specifically asked attendees to notify the Working Group if they know about patents or patent applications that are (or may be) required to implement the standards, so the Chair can send out letters to patent holders to request the appropriate IP statements.

1.8 Individual Representation

All attendees are representing themselves as individuals and not companies and/or any special organization.

1.9 Anti-Trust Laws

Discussion of price is disallowed in 802.11 sessions due to the threat of price fixing. Price fixing discussions are governed by Anti-Trust Laws and are illegal.

1.10 Copyrights

If you know of copyrighted or proprietary material that is in the standard as we have drafts now, please let the group know so the Chair has the opportunity to request release.

Standards Publication shall constitute a "work made for hire" as defined by the Copyright Act. IEEE owns the copyright of the standards publication.

1.11 Other Announcements

1.0.1 Recognition Awards

802.11a

The following awards were made in the 802 opening plenary:

- Task Group Chair Naftali Chayat
- Technical editor Hitoshi Takanashi
- WG Chair Vic Hayes
- Liaison with ETSI Jamshid Khun Jush
- Liaison with MMAC Tomoki Oshawa

Technical Contributions were also acknowledged with awards to the following:

- Masahiro Morikura
- Richard van Nee
- Tal Kaitz

802.11b

The following awards were made in the 802 opening plenary:

- Task Group Chair John Fakatselis
- Technical editor Carl Andren
- WG Chair Vic Hayes

Technical Contributions were also acknowledged with awards to the following:

- Mark Webster
- Jan Boer
- Dean Kawaguchi
- John Cafarella
- Chris Heegard

1.0.2 Reinstating Voting membership

Dave Bagby requested the Chair to reinstate his voting membership. The meeting was advised:

- Participated in the first meeting
- Participated in 43 out of 47 meetings
- Last meeting participated in July 1998
- Attended November 1999
- Need to excuse for March 1999 meeting

There being no objection, Dave Bagby's voting rights were reinstated.

1.0.3 Events to honour 10 years of service by Vic Hayes as Chair of 802.11

The Chair temporarily handed over the chairmanship of the meeting to Al Petrick who outlined the events.

Approval of the minutes of past meetings

2.1 Koloa meeting minutes 11-99/271

Motion 00/61P01 (169)	To approve doc.: 99/271 Koloa meeting minutes.
Moved:	Stuart Kerry
Seconded:	John Kowalski

Discussion: none

Motion passes 25-0-1

2.2 Tel Aviv meeting minutes 11-00/007

Motion 00/61P02 (170)	To approve doc.: 00/007 Israel meeting minutes.
Moved:	Stuart Kerry
Seconded:	Hitoshi Takanashi

Discussion: none

Motion passes 19-0-3

2.3 Matters Arising from the Minutes

There were no matters arising immediately from either of the approved minutes.

Reports

3.1 Monday ExCom Meeting

Vic Hayes reported:

- New PARs
  - 11e, MAC Enhancements
  - 11f, Rec Practice for IAP
  - 15.3 High Rate PHY
  - 16.3 Air interface for sub 11 GHz operation
- Friday Plenary
  - **Is there continued interest in the Friday Plenary meeting?**
    - Should the Friday morning 802 LMSC Closing Plenary be eliminated, with the summary/recap information distributed via www.ieee802.org? Information will be available no later than the following Friday. It was noted that the Chairs will need to supply the slides by Friday 8am.

    Vote: 63/0/5
    - If the Friday closing plenary were eliminated, and the closing SEC meeting was moved to Friday morning, would your working group benefit from the additional time available for working group meetings?
    - Do you recommend to move the SEC from Thursday?
      Discussion: It was noted that fewer WG members would be likely to attend a Friday SEC meeting. Moving to Friday would not allow our 802.11 WG more time since we already work until late Thursday afternoon. Some WG's cease work early afternoon to allow preparation for the SEC.

    Vote: 1/18/34

- EUI-64 RAC Policy
  - Supplies the 24-bit code for unique MAC addresses
  - Now also being used for other purposes
  - Lower cost devices (light switches) drive need for codes sky-high
  - 48 address may not be sufficient
  - 64 may not be enough
  - 128 MAC addresses are now being proposed – a meeting will look at this on Wed PM

  Discussion: 2^64 is a very large number. It was asked whether network address translation had been properly considered – many devices never talk to each other. There is enormous pain involved in changing so it seems appropriate for the technical solutions to be found first to accommodate any change and enable the transition. It was noted that extra address length will increase MAC overhead and there is no method of conveying extended addresses over legacy networks. One reason for the IEEE need for extended addresses is that addresses are allocated in blocks of 1 million. There is a claim that next year there will be 410m handsets shipped and every one will need an address. Summary: more work is needed to consider the root cause and alternatives to the present allocation schemes before proposing a change.

3.2 Financial report of the Tel Aviv meeting

Vic presented the summary financial report. The total cost for the meeting was $10,747. Receipts were $11,500 from 43 attendees, giving a surplus of $753.

Motion 00/61P03 (171)	To approve the expense report for Jan 2000 Israel interim meeting financial statement.
Moved:	Bob O'Hara
Seconded:	Harry Worstel

Discussion: none
Motion passes 30/0/0

3.3 Letter Ballots

- FCC on rule changes. Approved.
- FCC re direct sequence testing. Approved.
- Fold into one letter if both approved. Approved. Filed on 2 October.

3.4 CEPT PT SE24S

To allow 4W EIRP devices in the 2.4 GHz band. There is a report, posted on the 802.11 web site including spreadsheets, on the interference that would result. It is proposed that there will be only an 8 MHz band in the middle of the band.

Review of contributions

Vic Hayes reviewed the list of document submissions from 00/026 to 00/037.
On Wednesday morning there is a technical meeting of 802.1 to discuss security and 802.11 has been asked to contribute to those discussions.
Vic asked for further submissions:

- 802.1x enhancements Bernard
- 802.1x enhancements Tim Moore
- QoS Duncan Kitchin
- Enhancements to WEP encryption formats

Adoption of the agenda 11-00/026-r2

It will be necessary for the full WG to continue to work into the scheduled TGd session this afternoon to address comments on the PARs.
Vic Hayes noted three items:

- Regulatory matters to be discussed include: 5 GHz global allocation, docket 99-231. Vic may take on chair-ship of Regulatory task group.
- There is a proposal for a TG on marketing
- Japan was making changes to its regulatory domain rules for 802.11 bands.

Schedule Changes:
New items 7.4 to 7.8 were added. Item 7.7 on the Santa Rosa budget will be deferred until Wednesday.
Vic drew attention to the schedule table in the Agenda document doc.: 802.11-00/026-r2.

Motion 00/61P04 (172)	To approve the amended Meeting Agenda doc.:00/026-r2
Moved:	David Skellern
Seconded:	Dennis Kuwahara

Discussion: none
Motion passes: 26-0-0

The meeting adjourned for a break at 1508.

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The meeting continued with the approved agenda at 1536.

Unfinished Business

6.1 TGd

No unfinished business. Will work on TGd draft today.

6.2 Regulations
Jim Zyren will The ad hoc group on regulations was asked to review this matter and report to the WG.

6.3 TGb-cor
Vic Hayes reported that a new editorial error has been found in the 802.11b MIB. Although this is editorial, the Chair advises that there may be consequent The recommendation is that the PAR be revised to incude

Motion 00/61P05 (173) To propose a change to the 802.11b-cor1 PAR to the effect that the scope extends to the PICS proforma. To make a new draft standard giving the instructions to repair the PICS and submit that to a WG Letter Ballot Moved: Hitoshi Takanashi Seconded: Tim Godfrey

Discussion: none
Motion passes 25-0-3

6.4 SG enhanced MAC
Deferred until John Fakatselis arrives.

6.5 SG IAPP
Deferred until John Fakatselis arrives.

New Business

7.1 Election of Officers

WG Chair
Stuart Kerry, nominated by Dave Bagby, was elected, there being no further nominations.

WG Vice-Chair
Al Petrick, nominated by Stuart Kerry, was elected, there being no further nominations.

WG Co-Vice-Chair
Harry Worstel, nominated by Stuart Kerry, was elected, there being no further nominations.

WG Secretary
Tim Godfrey, nominated by Stuart Kerry, was elected, there being no further nominations.

Chair handed to Stuart Kerry.

There was round of applause for Vic as Parliamentarian.

WG Parliamentarians
Vic Hayes, nominated by Harry Worstel, and Bob O'Hara, nominated by Tim Godfrey, were elected, there being no other nominations.

Chair handed back to Vic Hayes.

TG Chairs

- TGd Regulatory domains
  Bob O'Hara, nominated by Dennis Kuwahara, was elected, there being no further nominations.
- TGb-cor1 MIB & PICS repair
  Victoria Poncini, nominated by Stuart Kerry, was elected, there being no further nominations.
- TGe MAC Enhancement
  Dave Bagby, nominated by Stuart Kerry
  John Fakatselis, nominated by John Kowalski
  Discussion: there was discussion on deferring the election until the candidates positions could be presented.
- TGf Recommended Practice IAP
  Discussion suggested that both Dave Bagby and John Fakatselis would be nominated.

Motion 00/61P06 (174) to postpone the election of the TGe and TGf WG chairs to the Full WG meeting of Wed at 1530. Moved: David Skellern

Seconded:	Jim Zyren

Discussion: none

Motion passes: 30-0-3

7.2 PICS numbering Issue

Some inconsistent numbering crept into the PICS for 802.11b. This requires edits and cross-checking references. The work to do this would be handled in TGb-cor.

7.3 ISO/IEC Fast Track vote for 802.11a

Motion 00/61P07 (175)	to advise the US member body to vote APPROVE to the Fast Track procedure on 802.11a and to attach the published version of 802.11a as replacement of the version that is currently out for ballot.
Moved:	David Skellern
Seconded:	Hitoshi Takanashi

Discussion: none

Motion passes 25/0/0.

7.4 ISO/IEC Fast Track vote for 802.11b

Postponed until July

7.5 New PAR for 802.11 Update of information on Regulations for Japan

Vic Hayes suggested that the group needs to change the published 802.11 standard to allow for the new published regulations in Japan. However, Bob O'Hara, Chair of TGd, explained that the aim of TGd was to avoid this sort of change since it provides a mechanism for the regulators in each domain to provide information that can be updated in the standard. It was noted that there are really only three important domains – US, Japan & Europe.

7.6 Port Base Access, draft 802.1x

Deferred to the SG.

7.7 High Rate PAR for PAN

Vic Hayes reported that he had voted NO in the SEC on formation of this group because it doesn't provide anything in its present form that is not met by 802.11.

Discussion: It was suggested that a PAN modulation technique could come under 15-247 or 15-209. Shouldn't a personal area network be for one user, not many? The PAR seemed to sit squarely under 802.11's charter.

Motion 00/61P08 (176)	Move that the Chair appoint an AdHoc group to work on agenda item 7.7 and prepare a recommendation to the WG. The ad hoc group to report to 802.11 full WG which shall reconvene at 0830 Tuesday morning for the sole purpose of considering the recommendation and taking action before the 802 SEC 5pm Tuesday deadline for the 802 commentaries and taking action on wording of a motion..
Moved:	Dave Bagby
Seconded:	John Kowalski

Discussion: none

Motion passes 32/0/0.

David Skellern was appointed to convene the AdHoc.

7.8 802.16.3 Air Interface for Fixed Broadband Wireless Access Systems Operating Below 11 GHz

Motion 00/61P09 (177)	Move that 802.11 strongly objects to the inclusion of unlicensed bands in the PAR for sub 11 GHz operation by 802.16 because 802.11 covers outdoor operation for many services
Moved:	Bob O'Hara
Seconded:	Harry Worstel

Discussion: There is no distinct identity for 802.16 in the 5 GHz bands since 802.11a and 802.11b can already operate and meet the necessary requirements. There was a claim that the requirements of 802.16 are not met in the unlicensed bands at any frequency.
Motion passes 20/0/4.

Motion 00/61P09 (177)	To amend the motion: *that 802.11 strongly objects to the inclusion of unlicensed bands in the PAR for sub 11 GHz operation by 802.16*
By adding: *because 802.11 covers outdoor operation for many services*	
Moved:	Peter Ecclesine
Seconded:	Bob O'Hara

Note: The same ID was kept and the Vote taken in the amended motion
Discussion: It is useful feedback to the 802.16 WG to explain why there is an objection.
Motion passes 23/0/0.

It was noted that 802.16 looked to solutions at speeds up to 155 Mbit/s

7.9 Agenda

Motion 00/61P10 (178)	To change the meeting agenda to replace the SG IA meeting by TGd in doc.:00/026-r2
Moved:	Bob O'Hara
Seconded:	Eckard

Discussion: none
Motion passes: 21-0-0

Motion 00/61P11 (179)	Motion to reconsider motion 178 to change the meeting agenda to replace the SG IA meeting by TGd in doc.:00/026-r2 **WITHDRAWN**
Moved:	Stuart Kerry
Seconded:	Tim Godfrey

Discussion: Withdrawn

Motion 00/61P12 (180)	To change the planned 1030 TGd session to SG MAC enhancement in doc.:00/026-r2
Moved:	Amar Ghori
Seconded:	Tim Godfrey

Discussion: none
Motion passes: 22-0-3

Adjourn for subgroups

The Plenary meeting adjourned at 1735 hrs.

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Tuesday, 7 March Plenary Session IEEE P802.11

1.12 Opening:

Session called to order by Vic Hayes at 08:30, with Tim Godfrey taking notes for the secretary (presenting).

7.7 *cont* High Rate PAR for PAN

Document "Comments on 802.15 HRSG PAR"
Presented by David Skellern

Key points:

Definition of Personal Operating Space is unsatisfactory since it encompasses distances greater than 10 meters, which is inconsistent with the charter of 802.15.

How are the HR requirements different than 802.11 and what unique market and/or set of users does it address?

Interoperability is only defined with respect to 802.15 and not 802.11.

Discussion

Motion 00/61P13 (181) To form a Joint AdHoc task group from 802.11 and 802.15 memberships to address the 802.15.3. PAR, and then to report back to the individual WGs.
Moved: Ivan Reede
Seconded: Alan Heberling

Point of Order – question on the voting status of the mover. Voting status is confirmed

Discussion:

There is a deadline for comments on this PAR. We can't accomplish this, so it would result in doing nothing. Speaks against the motion.

Review of the deadline – the ExCom meets on Thursday evening. Comments must be received by Tuesday at 5:00PM to be on the ExCom agenda.

As a practical matter, this is not on the agenda. Ask for a show of hands of who would be a part of this group in light of the other work that is on the agenda for 802.11. Informal poll shows no 802.11 members would work on this.

The 802.15 PAR is asking to have free reign to standardize anything, based on a call for applications yet to occur. The scope of the work should be defined before starting work.

The 802.15 chair suggests that input could be accepted later than the deadline today. We could continue working tomorrow.

The motion is ruled out of order by the chair, based on the language of motion ID-176 that chartered the work to be accomplished in this plenary session.

Discussion

Bruce Kramer objects to the ruling of the chair.

Vote: 802.11 members supporting the ruling of the chair. **18/5/5**. The ruling holds.
The motion is out of order.

Motion 00/61P14 (182) Move to adopt the comments from the AdHoc group addressing the 802.15.3 PAR, and to submit the comments to 802.15 and SEC as the position of 802.11. Moved: Bob O'Hara Seconded: John Kowalski

Discussion:
Move to Table the motion until 5:00PM tonight. Ivan Reede
Ruled out of order by the chair – does not meet deadline.
Change of motion of table until 4:00PM tonight.
Question – is this to table or postpone until a definite time.
Still out of order because there is not a WG meeting at that time.

Motion passes 17/4/5

Work completed, the session is automatically adjourned for subgroups

The Plenary meeting adjourned at 0909 hrs.

Wednesday, 8 March 2000 Joint Meeting of IEEE P802.11 and P802.15

Scheduled: 1:00pm – 3:00pm

The minutes of the joint meeting are recorded separately in doc: IEEE P802.11-00/058.

Motions of the P802.11 WG recorded in that meeting include those numbered 00/61 (ID 183-186).

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Wednesday, 8 March 2000 Meeting of IEEE P802.11

Scheduled: 3:30pm – 5:30pm

9 Opening

Meeting called to order by Vic Hayes at 3:34PM and David Skellern, Secretary 802.11 was ready to take the meeting notes.

9.1 Agenda Update

Vic Hayes presented the updated agenda.
10.1 Approval of PAR change.
It was noted that liaisons to other WGs are appointed not elected.

Motion 00/61P17	(187)	To approve the agenda as modified doc.:00/026-r3.
Moved	John Fakatselis	
Seconded	Dennis Kuwahara	

Discussion: none
Motion passes 28-0-0

7.1 Election of Officers

TGe MAC Enhancement

Dave Bagby nominated by Stuart Kerry - withdrawn
John Fakatselis, nominated by John Kowalski
Accepted by acclamation

TGf Recommended Practice IAP

John Fakatselis had volunteered and withdrew
Dave Bagby, nominated by Stuart Kerry, was accepted by acclamation.

John and Dave confirmed they gave permission for their details to be place on the Web.

10 Reports from Sub-Groups

10.1 TGd

Bob O'Hara reported that all comments except one have been dealt with and implemented. We will have a new draft tomorrow.

10.2 SG, approval PAR / 5 Criteria for enhanced MAC

Three comments from ExCom were resolved this morning.

Motion 00/61P18	(188)	To accept the response to the 802.16 chair as well as the modified PAR as a result of the comments SG Enhanced MAC PAR doc.:11-99/273r2
Moved	John Fakatselis for group	

Discussion: none
Motion passes 31-0-2

SG progress: last CFP for MAC Enh and IAP led to 12 papers. 6 presentations all on MAC Enh were made on Tuesday. Four more papers will be presented on Thursday morning. The remaining papers are submissions that will not to be presented.

10.3 SG, approval PAR / 5 Criteria for IAP

JF Digital Ocean, Lucent and Aironet gave a guideline several years ago – this was lodged again last year as doc.:99/207. There were no changes.

10.4 TGb-cor1, approval PAR change

This deals with changes to the MIB and PICS.

Motion 00/61P19 (189) To submit the revised PAR to SEC for approval of submission to the March meeting of NESCOM. response to the 802.16 chair as well as the modified PAR as a result of the comments SG Enhanced MAC PAR doc.:11-99/273r2 Moved Victoria Poncini Seconded Ivan Reede

Discussion: none

Motion passes 25-0-1

10.5 Regulatory

Done at Joint meeting – see item 4.3 of the minutes (doc.: 00/058)

11 New Business

There was no new business.

12 Adjournment

There being no other business, the Meeting adjourned at 1623 hrs.

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Thursday, 9 March 2000 Full WG Closing Plenary of IEEE 802.11

Scheduled: 1:00PM to 3:30PM

(Secretary note: There is no record of a motion with ID 190)

Motion: 00/61 (190) Assumed VOID
Moved:
Second:

13 Opening

The closing plenary was opened by Vic Hayes at 13:10, and Tim Godfrey, Acting Secretary was ready to take notes.

13.1 Announcements

Status Liaison letter to ETSI.
Request for book signing.

13.2 Document List Update

Some papers are still missing
Next Document number 56

13.3 Agenda Adjustments

TGd
Regulations
Study Group Enhanced MAC
Fast Track Vote for 8802-11/DAM1
Unfinished Business
New Business
Propose a new study group for high rate extensions for 802.11b

Motion: 00/61P20 (191) To approve the agenda
Moved: Matt Shoemake
Second: Dennis Kuwahara
No Discussion

Motion Passes 25/0/0

14 Reports from Subgroups

14.1 TGd

Review of comment resolution – 15 comments were addressed in the text of the drafts
Subgroups addressed PICS, State Machines, MIB, and Comments
New draft was released and placed on the server in the Drafts folder.
Approved a motion to issue 802.1d/D1.5 to a 15 day working group recirculation ballot and to request conditional approval from 802 SEC for sponsor ballot. Passed unconditionally in TGd

Motion: 00/61P21 (192) To issue 802.1d/D1.5 to a 15 day working group recirculation ballot and to request conditional approval from 802 SEC for sponsor ballot
Moved: Bob O'Hara

Second: none
No Discussion

Motion Passes 24/0/1

14.2 Regulations

No new business since last plenary session

14.3 Study Group Enhanced MAC

A report has been published on the activities of the Study Group.
11 papers were presented with proposal and general information.
This is the last activity of the Study Group. Work will continue as Task Group E (MAC Enhancements) and Task Group F (IAPP). John Faketselis will chair TGe and Dave Bagby will chair TGf.
An Ad Hoc group generated a revised Requirements document (0008-r3)
No Motions to present

14.4 Fast Track Vote for 8802-11/DAM1

IEEE 802 LMSC Resolution :To advise the US Member Body to vote to "approve with comment", the comment being that the object of the ballot ought to be replace by the published standard 802.11a-1999 that only differs from the object under ballot by pure editorial and cosmetic improvements.

Motion: 00/61P22 (193) To advise the US Member Body to vote to "approve with comment", the comment being that the object of the ballot ought to be replace by the published standard 802.11a-1999 that only differs from the object under ballot by pure editorial and cosmetic improvements.
Moved: Harry Worstell
Second: Denis Kuwahara
No Discussion

Motion Passes 24/0/0

14.5 802.11b-cor1 (addition to 802.11b to correct the PICS)

We already approved the PAR change, and it will be submitted to Ex Com.
We need to renumber all references in the PICS status column to correct discrepancies.

Motion: 00/61P23 (194) To add the contents of document 00/055 into draft 802.11b-cor1/D1.2 and to start a working group recirculation ballot.
Moved: Ivan Reede
Second: Erwin Noble
No Discussion

Motion Passes 25/0/0

15 Unfinished Business

15.1 Output Documents

802.11b-cor1: New output document is version 1.3, will be put out to recirculation ballot.

15.2 Next Meeting

Process TGd recirculation ballot results
Process 802.11b-cor1 recirculation ballot results and submit to sponsor ballot
Start the work on 802.11e and 802.11f
Send letters to liaison groups

Motion: 00/61P24 (195) To give the assembly at the May 2000 conference the mandate to resolve the outcome of the recirculation ballot on 802.11b-cor1 and to submit the results to sponsor ballot.
Moved: Bob O'Hara
Second: Ivan Reede
No Discussion

Motion Passes 25/0/0

Motion: 00/61P25 (196) To give the assembly at the May 2000 conference the mandate to resolve the outcome of the recirculation ballot on 802.11d and to submit the results to working group recirculation ballot if needed.

Moved: John Kowalski
Second: Ivan Reede
No Discussion

Motion Passes 28/0/0

Motion: 00/61P26 (197) To give the assembly at the May 2000 conference the mandate to submit letters to regulatory or liaison organizations as needed via SEC.
Moved: Ivan Reede
Second: Ken Clements
Discussion:
Request to add the words "via SEC" at the end of the motion.
Amendment approved by unanimous consent

Motion Passes 28/0/0

15.3 Other interim meetings required – no.

16 New Business

16.1 Study Group for High Rate extensions to 802.11b

Motive – several members have expressed that extensions to higher rates of 802.11b are feasible. Furthermore, since several of us are working independently, we believe that we need to converge and keep a common and standardized approach.
Matthew Shoemake nominated for chair of Study Group.

Motion: 00/61P27 (198) To authorize an IEEE 802.11 Study Group to investigate technical extensions that are interoperable with 802.11b and that can lead to higher than 20Mbps data rates and other performance improvements to the existing 802.11b standard. The group shall present any candidate PARs to 802.11 in time for those PARs that are approved to appear on the November 00 SEC agenda.
Moved: John Faketselis
Second: Chris Heegard
Discussion:
Do we really need three sessions? This is a study group – the group just generates a report, and may be extended as necessary.
An un-announced chip set supporting 22Mbps has been developed and will be demonstrated in a short time.
Does extension mean interoperability with the current standard? Friendly amendment is suggested: add text "interoperable with 802.11b" to motion. Amendment approved by unanimous consent.
Proposal of amendment to shorten length to 2 sessions. Discussion: the target is to have a PAR approved by November 2000.
Amendment to specify at least 20Mbps. Amendment approved by unanimous consent.
Amendment to last sentence – present PARs for approval at November Plenary. Amendment approved by unanimous consent.
Question Called – no objection

Motion Passes 30/0/0

Motion: 00/61P28 (199) To give the assembly at the May 2000 conference authorization to pre-submit the PAR(s) of the just established Study Group (SG2.4GHz) to the July SEC meeting.
Moved: Denis Kuwahara
Second: John Kowalski
No Discussion

Motion Passes 28/0/0

Matthew Shoemake was nominated as Chair of Study Group (SG-2.4GHz). No other nominations.
Approved by acclamation.

16.2 Standards Funding

Jim Carlo spoke to the issue of standards funding. The objective is to make the standards more readily available. Need somewhere between $250-400k.
IEEE 802 Standards Availability Principles - Survey

- Would you consider to offset the IPF fees and contribute the $100 per meeting to initiate this program (No net fee change) 43/1/9
- Would you consider soliciting your company to be an 802 sponsor for this program for about $10k per year 22/11/12

Possible benefits:

- Sponsor recognition on special web page for downloading
- Companies able to advertise that they are IEEE 802 Sponsors

16.3 Special applause for Vic.

Vic thanked people for help in arrangements with this meeting, chairs of subgroups, editors, secretaries and brilliant technical people that added to the standards.

17 Closure

Meeting adjourned at 15:00.

Attendance list for the meeting held at Hyatt Regency, Albuquerque, NM

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Tentative meeting schedule

Date	Place	Hotel	Type	Host
May 8-12, 2000	Seattle, WA	Renaissance Madison Hotel	Interim	Boeing
July 10-14, 2000	La Jolla (San Diego), CA	Hyatt Regency	Plenary	
September 18-22, 2000	Phoenix, AZ	Pointe Hilton South Mountain	Interim	
November 6-10, 2000	Tampa, FL	Hyatt Regency	Plenary	
March 12-16, 2001	Hilton Head	Hyatt Regency	Plenary	
July 9-13, 2000	Portland, OR	Portland Marriott	Plenary	
November 12-16, 2001	Austin, TX	Hyatt Regency Town Lake	Plenary	
March 11-16, 2002	?	?	Plenary	
July 8-12, 2002	Vancouver, BC	Hyatt Regency	Plenary	
November 11-15, 2002	Montreal, PQ	Queen Elizabeth	Plenary	

IEEE P802.11 – P802.15
Wireless LANs – Wireless PANs

Tentative Minutes of IEEE P802.11/P802.15 Joint Session

Hyatt Regency Hotel, Albuquerque, NM

Wednesday, 8 March 2000 Joint Meeting of IEEE P802.11 and P802.15

Scheduled: 1:00pm – 3:00pm

1. Opening

Meeting called to order by Vic Hayes at 1:07 PM and David Skellern, Secretary 802.11 and Pat Kinney, Secretary 802.15 were ready to take the meeting notes.

1.1 Roll call

All 106 people present at the start of the meeting introduced themselves.

1.2 Document list update

Vic Hayes and Bob Heile noted the following new documents were available to the WGs:

- doc.:802.11-00/047 is the latest one in dot11.
- No 802.15 docs were reported

1.3 Announcements

1.3.1 Election of 802.11 Officers

Vic Hayes reported the election of Stuart Kerry (Chairman), Al Petrick (Vice-Chair), Harry Worstel (Co-Vice-Chair), Tim Godfrey (Secretary), Bob O'Hara, (TGd & Parliamentarian), Victoria Poncini (TGc), Vic Hayes (Parliamentarian).

2 Approval of Minutes

Motion 00/61P14 (183) To approve the minutes of the Joint 802.15 and 802.11 Israel meeting (802.11). Moved Stuart Kerry Second Dennis Kuwahara

Discussion: none

Motion Passes: 802.11 26-0-1

802.15 has already approved these minutes.

There are no matters arising from the minutes

3 Approval of the Agenda

3.1 Agenda update

Revised/new items were:

4.6 802.11 Study Group MAC Enhancements/IAPP (IAPP added)
4.7 802.15 Study Group Hi Rate
4.8 802.15 TG2 Co-existence
5 New Business
- ❑ Office 2000
- ❑ Voting Rule

Motion 00/61 (184) VOID Moved Second

Motion 00/61P15 (185)	To approve the agenda as proposed (802.11)
Moved Ivan Reede	
Second Matt Alspaugh	

Discussion: none
Motion Passes: 802.11 34-0-0

Motion 00/61	To approve the agenda as proposed (802.15)
Moved Pat	
Second Alan	

Discussion: none
Motion Passes: 802.15 by unanimous consent

4. Old business

4.1 Liaison officers
Vic Hayes reported that Bruce Kraemer, Stuart Kerry and Peter Murray were appointed as 802.11 liaisons to 802.15 (motion 99/57P24 at the Montreal meeting). Alan Heberling and Mike McInnis are the reverse liaisons.

Do these need to be revoted? Vic would research and advise.

4.2 Review status of TG1, 802.15 draft standard and WG letter ballot #1
Ian Gifford reported: completed letter ballot 2 and going to disposition letter ballot 1. Received 1013 comments on database with 43 declines. Part of the comment database has been placed as an errata in the Bluetooth spec.

Editing draft 0.7 to be done by May.

Draft 0.8 will include errata, SDL and PICS by mid-May. Then a 40-day LB (3) is to be ready for the 802 La Jolla meeting. Disposition in La Jolla and decide there if go to Sponsor Ballot.

4.3 Review Joint Regulatory activities
Dennis Kuwahara's report will be posted on both 802.11 and 802.15.

- RF Lighting
  OET has made a determination and forwarded to FCC but not yet public.
- Review of 2.4GHz NPRM Comments
  Kodak has put forward alternative and looks like this will be adopted.
  Jim Zyren gave excellent paper .

4.4 P802.15 Hosted Venue choices

- Mike McInnis spoke to doc.:802.15-99/097. May 8-12 Renaissance Madison Hotel; lunch provided. Planning for 70-75 people. 46 people in the room said they would attend.
- Doc 15/ 99137r3 is on hotel reservations. Deadline is 23 March
- Chairs of TGs should give an estimate of number of people over a two year period to WG chairs
- Moving forward with 18-22 September 2000 is Pointe Hilton South Mountain, Phoenix Arizona.
- Need January volunteer.

4.5 P802.15 Study Group Interoperability

Does not exist

4.6 802.11 Study Group MAC Enhancements/IAPP
John Fakatselis reported there were 12 papers submitted. Six presentations all on MAC Enh were made on Tuesday Four more papers will be presented on Thursday morning. The remaining papers are submissions that will not to be presented.

Comments on the PAR have been resolved and will be forwarded to the WG for approval and then to ExCom.

4.7 802.15 Study Group Hi Rate PAN/PAR
Bob Heile and Jim Allen explained revisions to the PAR to address comments by 802.11. Key issues included limiting the range to less than 10m and a cost/data rate/power dissipation/complexity tradeoff commensurate with 802.15.1.

Stuart Kerry suggested that a proposal from 802.15 relating to the need for 802.11 to address a lightweight MAC would be welcome.

Motion 00/61P16 (186) to move that 802.11 endorse the 802.16 revised high rate PAR 99/165r6 (802.11). Moved Bob Heile Second David Skellern

Discussion: none

Motion Passes: 802.11 21-2-9

4.8 802.15 Study Group Coexistence

Steve Shellhammer summarised the SG Report #2 802.15-00/090r0. PAR passed in November SEC and Jan became TG. Still agreeing on coexistence definition – to understand when there is a problem and propose a model to verify the Recommended Practice. There is a new 802.11/BT simulation model. The coexistence model involves the PHY and MAC models as well as data models and propagation models.

5. New Business

5.1 Office 2000

Both WGs have all official documents in Office 97. Should we change to Office 2000?
Straw poll for a July change was 7 for, 24 against.
Straw poll for November – 64 for 10 against.

5.2 Notices

- Address Space Issue: Vic Hayes reported that the question of the need for 128-bit addresses has been raised. The ramifications for 802 systems was profound. More study was needed
- Eligible Voters for 802.11b – Vic reminded the meeting that registration for the 802.11b sponsor ballot had to be completed soon.
- Pick up CD 2000 disk this afternoon if you didn't get one in Hawaii.

5.3 Vic Hayes Award Presentation

Stuart Kerry presented an award to Vic Hayes for his period as Chair of 802.11 from 1990 to 2000.
Bob Heile and Vic Hayes jointly cut the 802.15 cake with a short range knife. The two WGs celebrated Vic's tenure with champagne and cake.

6. Adjourn

The meeting adjourned at 1442hrs.

IEEE P802.11
Wireless LANs

Minutes of the MAC Enhancment Study Group

Date: March 7, 2000

Author: Tim Godfrey
Intersil
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2 Meetings of the MAC Enhancements Study Group at the 802.11 March 2000 Plenary

2.1 Tuesday AM

2.1.1 Appointment of Secretary

2.1.1.1 Tim Godfrey

2.1.2 Call to order 09:16 by John Faketselis.

2.1.3 Proposed Agenda

2.1.3.1 Policies overview
2.1.3.2 Review of SG background and progress
2.1.3.3 Call for Papers
2.1.3.4 Presentation of Papers
2.1.3.5 Requirements definition process / Requirements document draft
2.1.3.6 Comments on Agenda

2.1.3.6.1 None

2.1.3.7 Agenda Adopted without comment or objection

2.1.4 Policies Overview

2.1.4.1 Show of Hands – How many first time members at an 802.11 meeting (15 to 20 people)
2.1.4.2 SG Policies and rules. This group is currently a study group. Everyone has voting rights and rights to debate. Rules are different in a task group and WG plenaries.

2.1.4.2.1 Key Motions:

2.1.4.2.1.1 Point of Order

2.1.4.2.1.2 Point of Information

2.1.4.2.1.3 Parliamentary Enquiry

2.1.5 Background / Overview of Work

2.1.5.1 SG work up to this point, SG Charter
2.1.5.2 Goal is to approve the PAR in March 2000.
2.1.5.3 John Faketselis is chair of the Study Group.
2.1.5.4 There are two PARs that have been submitted from this Study Group.
2.1.5.5 They are tentatively approved, and will be officially approved this week by ExCom.
2.1.5.6 The topics are broken into MAC Enhancements (QoS, Security, etc) and IAPP (Inter Access Point Protocol).
2.1.5.7 MAC Enhancements is a PAR to create a standard, while IAPP is a PAR to create a Recommended Practices document. (IAPP is beyond the scope of the charter of 802.11).
2.1.5.8 Schedule to completion for these PARs

2.1.5.8.1 Working group formed in September 1999. PAR was completed by November 1999. In November 1999, and January 2000, we worked on the requirements and scope. We have published requirements and evaluation criteria document on the 802.11 web site. We have made a call for proposals.

2.1.5.8.2 The requirements and criteria documents are drafts, and we will revisit them in this session and make additions and deletions.

2.1.5.8.3 PAR approved, WG formation – March 2000.

2.1.5.8.4 WG Draft For Recirculation – November 2000.

2.1.5.8.4.1 Recirculation is the voting process within the 802.11 working group. 75% approval is required. Informally, the approval should be 90% to have Executive Committee approval.

2.1.5.8.5 Sponsor Ballot – includes voters from Sponsor group of all 802. voters.

2.1.5.8.6 After Sponsor approval, there is an editorial process that must be completed before publication.

2.1.5.9 Questions on schedule

2.1.5.9.1 None

2.1.6 Review of schedule for this week

2.1.6.1 Tuesday AM, Wednesday AM, Thursday AM session
2.1.6.2 Possibility of additional evening session if required.

2.1.7 Call for Papers

2.1.7.1 Before presentations, there will be a brief review of the requirements and evaluation criteria by Chair
2.1.7.2 Submitted Documents from 802.11 opening Plenary.

2.1.7.2.1 Document 33 Joint paper from Sharewave Lucent, AT&T. “Qos Extensions to 802.11” – four sections, ½ hour each.

2.1.7.2.2 Document 34 and 35, Microsoft, “Microsoft 802.11x Enhancements”. Document 35 presented at 802.1x session

2.1.7.2.3 Document 36, 37, Intel , “Intel Qos”, “Intel Encryption Formats” – 10 minutes each

2.1.7.2.4 Document 28, Microsoft – 30 minutes, ask to defer to Thursday AM.

2.1.7.2.5 Document 29, Intel, 802.11 Security Models. – 40 minutes

2.1.7.2.6 Document 31, Seiko Epson, “Security Enhancements” – 20 minutes

2.1.7.2.7 Document 38, Sharewave, “End To End QoS”

2.1.7.2.8 Document 39, Spectralink Keith Amann, “Concerning additional requirements for MAC Enhancements” (not ready for presentation) – 15 minutes

2.1.7.2.9 Document 40, Sharewave, “MAC Enhancements Requirements Addendum” (Not ready for presentation) – 15 minutes.

2.1.7.3 Agenda / Groupings of papers

2.1.7.3.1 Encryption / Security

2.1.7.3.2 QoS

2.1.7.3.3 General Papers on Requirements

2.1.8 Break for 15 minutes

2.1.9 Schedule Review

2.1.9.1 Tuesday Evening session scheduled

2.1.10 Presentation of Papers

2.1.10.1 Document 37, Intel (Duncan Kitchen, Jesse Walker)

2.1.10.2 Document 29, Intel (Jesse Walker)

2.1.10.2.1 802.1x Security Model Summary

2.1.10.2.2 Summary

2.1.10.2.2.1 Recommends that 802.11 engage with 802.1x and use the result for the 802.11 authentication framework.

2.1.10.2.3 Discussion

2.1.10.2.3.1 Regarding the existing problems with 802.11 security, be aware that the hooks are there to provide an extensible security architecture. Also, we have to decide how much of a security infrastructure we want to try and standardize in a MAC and PHY standard

2.1.10.2.3.2 It doesn't make sense to provide complete security over the wireless link, if there are vulnerabilities in the wired network out of our control. Also we have to consider the cost implications and competitive nature of the WLAN marketplace.

2.1.10.2.3.3 Comment on Slide 4, it is incorrect that .11 has one algorithm and one frame work. It is extensible. Is a recommended practice document in conjuction with a normative document from .1 be sufficient? This requires investigation – it may be a better solution.

2.1.10.2.3.4 Question on Key Management – there are a number of options available. The customers demand a number of authentication options, some are legacy and weaker systems.

2.1.10.2.3.5 Is it worthwhile to spend time investigating if we can generalize the interface between the MAC and the security system?

2.1.10.2.3.6 Comments on layering – you need to protect the 802.11 link from the start of the connection.

2.1.10.2.3.7 The flip side of customer perception and market demand – in an enterprise, the deployment of the equipment may be forbidden if it has inadequate security.

2.1.10.3 Document 31, Seiko Epson (Masay\uki Ikeda, S. Watanabe)

2.1.10.3.1 "Proposal to use KPS to Enhance WLAN Security"

2.1.10.3.2 Summary

2.1.10.3.2.1 Problems with current standard WEP. Key Distribution Problem.

2.1.10.3.2.2 KPS is method to distribute shared keys safely.

2.1.10.3.2.3 MAC addresses are combined with private keys to generate keys for use with existing WEP algorithm. KPS algorithm is one-way so private keys cannot be regenerated.

2.1.10.3.2.4 Implementation of KPS system in an 802.11 MAC.

2.1.10.3.2.5 Strict control of private Ids and System IDs is required. Proposes that the 802.11 committee controls the KPS center.

2.1.10.3.2.6 SEC9H MAC and high rate baseband processor (GBT9).

2.1.10.3.3 Discussion

2.1.10.3.3.1 How does KPS prevent someone from masquerading as another MAC address? Issue is algorithm must be kept secret to maintain security.

2.1.10.3.3.2 Comment – see 8.3.2 paragraph 1 in the standard.

2.1.11 Adourn until 7:00PM

2.2 Tuesday Evening

2.2.1 Session Called to Order at 1900 hours

2.2.2 Presentation of Papers

2.2.2.1 Document 36, Intel, (Duncan Kitchen)

2.2.2.1.1 "Wireless LAN QoS"

2.2.2.1.2 Summary

2.2.2.1.2.1 Overview of requirements

2.2.2.1.2.2 End to End signaling (not just the 802.11 segment, but the whole network) Lowest layer for end to end signaling is the network layer.

2.2.2.1.2.3 Application Support – to the top of the protocol stack.

2.2.2.1.2.4 Suggestion of prioritization based on 802.1p tags, and RSVP in the network layer. Subnet Bandwidth Management uses tags to cause the MAC to follow RSVP QoS.

2.2.2.1.3 Discussion

2.2.2.1.3.1 What application space did you look at? Voice over IP and Video (netmeeting on PC), but not limited to PC plaform. Also broadcast video.

2.2.2.1.3.2 PCF didn't matter because it didn't specify connection setup. PCF is not the preferred mechanism. You would need to throw a huge effort behind PCF to make it work.

2.2.2.1.3.3 The negotiations for bandwidth involve upper layers. How do you resolve this with a layer 1-2 standard? Through the use of tags in the channel access protocol in the MAC layer.

2.2.2.1.3.4 Comment – the proposal here is part of the IETF effort. We should specify that 802.11 be compliant with that. SBM uses existing MAC services. Should we use existing mechanisms govern the QoS at the MAC layer? You can't make QoS guarantees with a shared media. The 802.1p mapping has to be honored. In 802.11 who is going to control this? (Defer issue for later discussion, perhaps a future paper)

2.2.2.1.3.5 Hasn't 802.1p been absorbed into 802.1d? Yes. You are saying not to use the PCF function at all? Yes

2.2.2.1.3.6 Agreement with using higher layer protocols for end to end. Assertions regarding PCF were not true, were they the TBS functions that were removed? The current PCF still has issues with polling lists. It may *have polling lists. (take discussion off line)*

2.2.2.1.3.7 What are you thinking of in terms of an access method? We are suggesting a prioritization mechanism.

2.2.2.1.3.8 On the PCF issue – it is part of the standard. If it was implemented and deployed, would it be a problem to the channel access mechanism you are suggesting? No it could work in parallel.

2.2.2.2 Document 33, Sharewave, AT&T, Lucent

2.2.2.2.1 "QoS Extensions to 802.11 MAC"

2.2.2.2.2 Intro section – Wim Diepstraten

2.2.2.2.2.1 History of joint effort.

2.2.2.2.2.2 Objectives – compatibility, simple, scalable to home and enterprise.

2.2.2.2.2.3 What is covered – Qos extensions, access mechanisms

2.2.2.2.2.4 What is not covered – security, authentication.

2.2.2.2.3 Context & Synergies Section – Raju Gubbi

2.2.2.2.3.1 Summary

2.2.2.2.3.1.1 Streams are the unit of QoS guarantees. There is a coordination entity per BSS. Transmission Opportunities (TxOps) are granted to streams but may sometimes be used othewirse.

2.2.2.2.3.1.2 Synergies – Admission Control, Selectable Acknowledge, Dynamic Bandwidth Management, Stream Synchronization, Roaming, BSS overlap management, FEC / Channel protection, direct STA-STA communication, multicast, dynamic channel frequency selection.

2.2.2.2.3.2 Questions / Discussion

2.2.2.2.3.2.1 Bits are needed to define and control these mechanisms. 802.1q (802.1d) is not enough. How many bits would be needed to define all of these? We are basically looking at an MAC extension, There will be specialized frames.

2.2.2.2.3.2.2 In a packet based system, how do you characterize a stream over the packet based system? Every stream has an ID, and goes through admission control.

2.2.2.2.3.2.3 For FEC and channel protection, do you assume a certain type of channel? There were specifics for delay spread, BER, etc. What are your thoughts on this? The assumption is applying a block code before going to the PHY. We are assuming the channel is going to have problems with delay spread and interference.

2.2.2.2.3.2.4 Are the systems self organizing, or do users need to manage them? The standard provides the hooks, but the product developers handle the user issues at the top layer.

2.2.2.2.3.2.5 The MAC buffers to support selective retransmission. Do you need to advertise window size? Yes.

2.2.2.2.3.2.6 These features are only useful if they are available end to end? Yes, we are providing hooks so that higher layers can use the MAC to provide the needed end to end services. How do you guarantee the service over other networks – for example 802.3? You don't – we are working on 802.11.

2.2.2.2.3.2.7 Do you see an opportunity to extend these mechanism to other wireless WG's such as 802.15, .16, etc? That is possible, but we are focused on 802.11. Also see the other presentation (Document 38) on End To End QoS. However, these issues are being discussed in other 802 groups.

2.2.2.2.3.2.8 Mechanisms for end to end QoS have been discussed. Most of these in the .11 BSS are things needed to make this look like a wired network. One issue is your mention of "guarantees". Attempts to guarantee are one thing, but the meaning of guarantee in an ISM band is different than in other QoS network specifications such as RSVP. Agreed – this needs to be clarified in terminology.

2.2.2.2.3.2.9 Is the coordination entity inside or outside the entity? Either. If an AP is oversubscribed for QoS traffic, would best effort transmissions be denied? You can have load balancing, and user level parameters can be specified on a per BSS basis.

2.2.2.2.3.2.10 There will be multiple kinds of networks, not just 802, and QoS will be needed through all of them.

2.2.2.2.3.2.11 When a client has obtained a stream, and their connection becomes bad so the PHY drops back to a lower rate, how is this handled? Different channel access methods have different ways of dealing with this

2.2.2.2.4 Straw poll – how many people think all 802 wireless standards should have a common QoS system (Majority) How many think all 802 wired and wireless standards should have a common Qos System (about 50%)

2.2.2.2.5 Media Access Methods – AT&T MediaPlex

2.2.2.2.5.1 Summary

2.2.2.2.5.1.1 "Guaranteed" QoS Service, and efficient BW utilization. Multimedia Transfer. Simple Extensions to MAC, fully compatible.

2.2.2.2.5.1.2 Virtual Streams, built on top of base PCF, DCF unchanged.

2.2.2.2.5.1.3 Central scheduling – coordination. Contention needed only during reservation request. Polling only if data available for lower overhead.

2.2.2.2.5.1.4 Parameters configure acknowledgement, flow, priority, FEC, privacy, delay and jitter bounds, and data rate and burst lengths.

2.2.2.2.5.1.5 Description of new control frames and operation within PCF CFP interval.

2.2.2.2.5.1.6 Description of Centralized Contention.

2.2.2.2.5.2 Questions

2.2.2.2.5.2.1 Is there any supporting document to help understand the details? AT&T will release a MediaPlex specification document on Thursday.

2.2.2.2.5.2.2 If you have a CBR stream that always needed the channel, how would the RR fit into that? The RR is one time. The only time the RR is needed multiple time is if the resource is not available (busy).

2.2.2.2.5.2.3 Collission resolution is based on the outcome of contention of all stations and can be optimized. Couldn't a station with unreasonable requirements bring down the network? No, the RR is fixed size.

2.2.2.2.5.2.4 From the description of the coordinated contention mechanism, would it would be correct to describe the CC frame as a Poll to a class of devices that have permission to transmit? Yes, CC is a kind of poll to a class of users.

2.2.2.2.5.2.5 If allowed by priority and permission, is it true that no contender can transmit more than one RR per contention interval? Yes.

2.2.2.2.5.2.6 Is there a bound for latency? How do you control frame length? It would be imlementation dependent. You don't wan the CFP rep interval to be too small because it is inefficient, or too large because it adds latency. Per Frame it is based on negotiated bandwidth. That is all a station is allowed to transmit.

2.2.2.2.6 Media Access Methods – Sharewave Whitecap

2.2.2.2.6.1 Summary

2.2.2.2.6.1.1 Proposed channel access mechanism

2.2.2.2.6.1.2 Transmission hierarchy

2.2.2.2.6.1.3 Use of channel

2.2.2.2.6.1.4 Advantages of the proposed channel access mechanism

2.2.2.2.6.2 Questions

2.2.2.2.6.2.1 Is there another information source for off line review? More details will be provided.

2.2.2.2.6.2.2 Are you relying purely on forward error correction or are there acks and retransmissions? The mechanics are independent, you could use one the other, or both.

2.2.2.2.6.2.3 The PCF as it is today allows for foreshortening. How do you manage it? We still have CFend.

2.2.2.2.6.2.4 When supporting rate fall back to lower rates, how do you handle that? If can be scheduled. The negotiation is for bandwidth (the amount of time). Such a device would take more time and deliver less data.

2.2.2.2.6.2.5 Is there any change to the existing PCF mechanism that removes capabilities? No. Is there any fundamental difference between AT&T and this, except in the allocation of the CF period, and how the requests are done? No.

2.2.2.2.6.2.6 Transmission start is based on Tx Slot, but how does the PC know if this station has nothing to send? There is a null packet, same as today's PCF.

2.2.2.2.7 Media Access Methods – Lucent Blackburst

2.2.2.2.7.1 Summary

2.2.2.2.7.1.1 Distributed access mechanism, based on existing DCF operation.

2.2.2.2.7.1.2 Newly added mechanism to support multiple priorities. Extra listen intervals are needed per priority level.

2.2.2.2.7.1.3 Description of BSS overlap operation situations.

2.2.2.2.7.1.4 Conclusion – Lucent would drop Blackburst if a scalable BSS overlap solution is developed for PCF.

2.2.2.2.7.2 Questions / Discussion

2.2.2.2.7.2.1 In the JSAC paper, the Tschedule paramter is defined to be a single number. Is that true? There should be a single base number – it could be that some stations use an integer multiple.

2.2.2.2.7.2.2 Then how would the protocol be stable if there are multiple values of Tschedule? You may need to do something extra in that situation- such as null packets.

2.2.2.2.7.2.3 Would you still approach this the same way in the 5GHz band where there are more channels available? Yes.

2.2.2.2.7.2.4 What would happen if the AP has higher xmit power than stations? How severe is the effect? It must be taken into account. It must be compensated with the sensitivity in the defer mechanism.

2.2.2.2.7.2.5 The minimum data frame size cannot be too small? With a large ratio between smallest and largest, the Blackburst overhead goes up. There are ways to use a two level Blackburst to help in this situation.

2.2.2.2.7.2.6 The rules say a CTS is sent after a RTS is received. What triggers a CTS? A normal DCF access. Revise document to say that there is a new frame exchange for CTS in this scheme.

2.2.2.2.7.2.7 In constant bit rate traffic, the self organizing properties might achieve stability. In the sequence of real time transmissions, where some or all transmit instances are variable in size, how is a receipient that does't get what it expected know if it is lost or just waiting? How does it know how long to wait before sending an NAK? A maximum length DCF packet is the longest timeshift the real time traffic would incur. The Blackburst analyis applies only to constant bit rate traffic. There may be a problem with VBR.

2.2.2.2.7.2.8 Is it possible that two or more stations have the same length Blackburst, resulting in a colission? If one station had successful access at one point, it will occur at the same time in the next interval. (for constant bit rate).

2.2.2.2.7.2.9 There could be collisions due to VBR traffic or jitter in arrival of traffic. What happens in that case? It depends on the assumption of a minimum duration of a frame. If the minimum is a null frame there will be no collision.

2.2.2.3 Document 34, Microsoft (Bernard Aboba)

2.2.2.3.1 "IEEE 802.11 Security and 802.1x"

2.2.2.3.2 Summary

2.2.2.3.2.1 To gather a list of the current vulnerabilities of the current standard security implementation.

2.2.2.3.2.2 How 802.1x addresses security vulnerabilities – EAP framework, Mutual Authentication

2.2.2.3.3 Questions / Discussion

2.2.2.3.3.1 Explain the assertion that new authentication mechanisms would require new hardware. They might, not necessarily though.

2.2.2.3.3.2 Please elaborate on how the address spoofing problem can be fixed at the AP. One failure is due to key mapping of key to MAC address. Attempts to spoof from an AP would be blocked by distribution services in a conformant implementation. Nothing else is needed.

2.2.2.3.3.3 For backward compatibility, management frames should not be encrypted.

2.2.3 Adjourn

2.3 Wednesday AM – PAR Comment Resolution session

2.3.1 Called to Order by John Fakatselis at 08:40

2.3.2 Resolution of comments on the 802.11 MAC Enhancements PAR received from Roger Marks, Chair 802.16

2.3.2.1 Suggestion 1: Modify the first sentence of the Purpose statement by adding the underlined word: "To enhance the current 802.11 MAC to expand support for LAN applications with Quality of Service requirements.

2.3.2.1.1 Suggestion Accepted

2.3.2.1.2	Motion to Accept suggestion and incorporate text into the PAR document.

2.3.2.1.2.1 Moved Michael Fischer

2.3.2.1.2.2 Second Greg Parks

2.3.2.1.2.3 Motion passes 12/0/1

2.3.2.2 Suggestion 2: Define the new application space enabled by the expanded MAC as means of clarifying the distinct identity of this new project.

2.3.2.2.1 Suggestion Accepted

2.3.2.2.2 New text: "Example applications include transport of voice, audio and video over 802.11 wireless networks, video conferencing, media stream distribution, enhanced security applications, and mobile and nomadic access applications."

2.3.2.2.3	Motion to accept suggestion and incorporate text into PAR document

2.3.2.2.3.1 Moved John Kowalski

2.3.2.2.3.2 Second Michael Fischer

2.3.2.2.3.3 Motion Passes 14/0/0

2.3.2.3 Suggestion 3: Add 802.16 to item 10b (IEEE Coordination requested by sponsor)

2.3.2.3.1 IEEE rules (IEEE-SA Standards Board Working Guide for the Project Authorization Request (PAR) Form, clause 12, paragraph 2, version 3 December 1999) specify that 802 working groups are internally coordinated and should not be listed in a PAR's section 10b. Therefore, 802.11 rejects this suggestion.

2.3.2.4 Motion to accept responses to all suggestions on PAR

2.3.2.4.1 Moved Harry Worstell

2.3.2.4.2 Second Anil Sanwalka

2.3.2.4.3 Motion Passes 13/0/0

2.3.3 Session Adjourned until Thursday 08:30

2.4 Thursday AM Session

2.4.1 Called to order at 0830

2.4.2 Agenda Update

2.4.2.1 Remaining Paper Presentations

2.4.2.2 New Papers

2.4.2.2.1 Document 32 "Hiperlan Type 2 System for Quality of Service", Jamshid Kush, Ericsson.

2.4.3 Presentation of Papers

2.4.3.1 Document 28, Microsoft (A Ayvgari et al)

2.4.3.1.1 "802.11 Quality of Service"

2.4.3.1.2 Summary

2.4.3.1.2.1 Use 802.1p to prioritize and limit traffic before entering the 802.11 network.

2.4.3.1.2.2 SBM extends RSVP to level 2 networks.

2.4.3.1.2.3 Access Points in 802.11 networks should support 802.1p.

2.4.3.1.2.4 Suggests change to DCF rules to allow shorter contention windows for priority traffic.

2.4.3.1.2.5 For Ad-Hoc networks, each station must implement admission control.

2.4.3.1.3 Questions and Discussion

2.4.3.1.3.1 How does this address power managed stations where the PM traffic is sent in a burst after a DTIM? High Priority traffic would be sent first after the DTIM.

2.4.3.1.3.2 Clarify 802.1p – it is really 802.1d, which contains queue tagging, which contains priority.

2.4.3.1.3.3 Adjusting the DCF timing can result in a loss of stability and other problems with the protocol. This technique has been attempted and it works in those cases.

2.4.3.1.3.4 You can't address QoS by just changing backoff. What if there are too many voice streams? Yes there will be delays, you have to allow for them. The applications have to work with delays greater than 100mS, now.

2.4.3.1.3.5 The driver has to support the appropriate admittance control mechanism.

2.4.3.1.3.6 Are there any simulations of this scheme? No. If an AP is sending a certain rate of data what happens if the channel degrades? The AP has to re-allocate the entire load. The driver would have to notify the applications for renegotiation.

2.4.3.1.3.7 Centralized control is usually more efficient – do you disagree? The problem we have with PCF is needing a small polling list. Believes that there are only two levels of priority in PCF.

2.4.3.1.3.8 Does Windows 2000 have a priority mapping? Because we are using RSVP we map priorities two levels into 802.1p.

2.4.3.1.3.9 Comment: QoS doesn't need and can't provide true guarantees. Secondly, proposals don't necessarily address Qos, but provide efficiency improvements. The change of dynamic changes in CW was discussed in the original MAC, and it was determined that it was a problem and should not be done. What kind of utilization are you projecting for the 802.11 network to implement this scheme? It has not been looked at.

2.4.3.1.3.10 Because of the nature of continuous streams, you end up with continous contention, and loss of efficiency. We have a back scheduler that smooths out bursts and hopes to minimize collisions.

2.4.3.2 Document 32, Ericsson (Jamshid Kuhn-Jush)

2.4.3.2.1 "HiperLAN type 2: A system with QoS support"

2.4.3.2.2 Summary

2.4.3.2.2.1 Presentation to show how Hiperlan type 2 has addressed QoS issues.

2.4.3.2.2.2 QoS issues were considered at the time of the MAC protocol design.

2.4.3.2.2.3 Convergence layer supports both cell based and packet based protocols from higher layers.

2.4.3.2.3 Questions / Discussion

2.4.3.2.3.1 Given that a Diffie Helman exchange takes 30 to 40 million instructions, and is done whenever you roam, how fast is roaming? Slow.

2.4.3.2.3.2 Can you use direct mode with the 802.1p convergence layer? One station takes on the function of the central station.

2.4.3.2.3.3 Is there any intention by BRAN to make public the presentations and documentation from BRAN meetings during their standards work? Perhaps could be arranged with 802 – typically only ETSI members have access.

2.4.3.3 Document 39, Spectralink (Keith Amann)

2.4.3.3.1 "802.11 MAC Enhancements: Additional Requirements Considerations"

2.4.3.3.2 Summary

2.4.3.3.2.1 Need for supporting variations in packet rates and sizes.

2.4.3.3.2.2 Support for latency limitations among different stations – don't use null packets.

2.4.3.3.2.3 QoS requirements per stream, not per STA. Needs to be clearer in requirements.

2.4.3.3.2.4 Need for compatibility with wireless bridges and repeaters.

2.4.3.3.2.5 Requirements need to address the hidden node problem, beyond the overlapping BSS issue.

2.4.3.3.2.6 Need for mid-range voice bandwidth in 16 – 32 Kbps rates.

2.4.3.3.2.7 Bandwidth efficiency should be an important evaluation criteria.

2.4.3.3.3 Questions / Discussion

2.4.3.3.3.1 How do you view the importance of the complexity of the protocol? We are a station developer – we don't want a complex protocol to add cost to the devices. Complexity in infrastructure is acceptable.

2.4.3.3.3.2 The current requirements document does have too low of latency requirements, especially for some vocoders. What do you see as the lower bound for latency for voice? 5 to 10 is definitely too small. Can't get into too much detail. Example; H.323 has 30mS buffer. Somewhere in that range is about right.

2.4.4 Requirements Documents Updating

2.4.4.1 Chair announces formation of an Ad-Hoc group to update requirements documents.
2.4.4.2 Asking all presenters to have a representative
2.4.4.3 Starting at 10:30 next door.
2.4.4.4 Output will be pubished by end of the day.
2.4.4.5 Including only the areas that we agree upon.

2.4.5 Presentation of Papers, Continued

2.4.5.1 Document 38, Sharewave (Raju Gubbi)

2.4.5.1.1 "Tutorial on achieving end to end QoS"

2.4.5.1.2 Summary

2.4.5.1.2.1 Definition of End to End QoS – preserving QoS characteristics from outside connection to any device in the BSS.

2.4.5.1.2.2 How it can be achieved – analyze and convert outside QoS semantics to a form usable by the 802.11 MAC.

2.4.5.1.2.3 How does an RSVP packet make use of the hooks in the MAC to support QoS.

2.4.5.1.2.4 Semantics conversion layer (between layer 3 and 2) also called Classifier.

2.4.5.1.3 Questions / Discussion

2.4.5.1.3.1 None

2.4.6 Adjourn at 10:20

IEEE P802.11
Wireless LANs

Tentative Minutes of the IEEE 802.11 Task Group D

Hyatt Regency, Alburquerque, New Mexico

7-11 March 2000

Date: March 11, 2000

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Task Group D Meeting Minutes March 2000

Chair for the week: Bob O'Hara

Secretary for the week: Al Petrick

Bob O'Hara reviewed the agenda

Introduction- ballot sent out, comments addressed

002R4 is comments from all balloters that was received, and the action taken to address them at the Jan. meeting.

Draft update which incorporated changes on the server (updated at the January meeting.)

Task is to finish comments.

~ 15 Comments remaining in the document.

3 major areas need to be addressed

1. Changes to MIB
2. PICS extension needs to be created for conformance to the standard
3. ???

We will have an agenda which we will modify and then approve, and then break into subgroups that will address each topic to create draft text, and then reconvene tomorrow to modify/approve text so that by the end of the week we would have a draft available to be approved by a conformation ballot.

TGd Agenda:

Secretary,
Call to order

Approval of the agenda
Approval of the minutes
Announcements
Review of comment resolution
Old business
New business
Adjourn

Agenda approved without objection
Approval of Minutes
(doc 99/248) Koloa, HI minutes approved.

(doc 00/06) Tel Aviv, Israel, minutes approved.

Announcements

IEEE patent policy mentioned – it applies in this group.

15 comments appear to remain to be addressed in the text of the draft;

Major items are:
MIB
State machines
PICS

From opening plenary meeting: example usage added to draft.

Meeting schedule mentioned:

Tues 1pm to 5pm
Wed. 10:30am –noon
Thurs 10:30am –noon

Total time for TGd activities: 7 hours.

Question on whether or not the state machines will be edited by the end of the week, since the s/w tool may not be available.

Victoria Poncini did some work drafting text for the MIB. She volunteered for heading up that group.

PICS- need to convert tabular form in table, where you find “shalls and mays” and map into a clause or requirement.

Matt and Denis Kuwahara volunteered for this.

Volunteer requested for writing text responding to the first comment, regarding what a STA does with information that it doesn’t respond to.

Straw poll soliciting who would volunteer for anything., since there was a dearth of volunteers.

Suggestion made to delegate the work to subgroups of the groups.

1. Comment above.
2. Adding MIB attributes (Victoria’s group)
3. Octet ordering in fields > a single octet. We need to make it clear and unambiguous which bytes appear first.

4. The Request Information Element needs references that it applies to FH only.
5. Make it optional that beacon carry info about regulatory domains. Need to verify that it's done.
6. Comment support for operations across regulatory domains is mandatory. ALL stations must adopt he parameters.

Beacon and Probe responses must be changed to include all parameters required. Contradicts with 5.

7. New status code added to allow access point to deny an association do to requesting station not supporting regulatory domain operation.

8. No mention of how FH parameters or FH table information elements are used in beacon frame. There needs to be a description of that.

9. No mention of FH parameters or FH table in Probe response.

10. Text change line 20 page 8.

11. Need to add text defining how to determine if a hopping pattern from the original standard is in use, and what to do if the BSS being joined

Dennis and Matt- PICS

Dick will coordinate the list of 13 comments (2 new comments)

Victoria will continue with MIB.

There was no updated draft of 802.11d. Al Petrick was called regarding that.
TGd Meeting Minutes Document number is "54"

Tuesday 2PM
The task groups broke down into sub-task groups to work out the text and comments.

TGd Meeting Minutes
Wednesday 10:30am
Update from each of the sub-task groups.

Motion: To incorporate the PICs changes into the draft

Moved by: Dennis Kuwara, Second: Dick Eckard

No discussion:

Motion passes: 9/0/3

Motion: To incorporate the miscellaneous changes to implement the remaining comment resolutions into the draft

Moved by: Dennis Kuwahra, Second, Victoria Poncini.

No discussion

Motion passes: 8/0/4

Motion: To incorporate the MIB changes to implement the remaining comment resolutions into the draft

Moved by: Dennis Kuwara, Second: Dick Echard

No Discussion

Motion passes: 8/0/4

Announcements

TGd is adjourn until Thursday at 10:30am

Thursday

Motion: To incorporate the MAC statemachine changes to implement the remaining comment resolutions into the draft.

Moved by: Dick Eckard, Second: Dennis Kuwara

No Discussion

Motion passes: 8/0/0

Motion: To issue 802.11d/D1.6 to a 15-day working group recirculation ballot and to request conditional approval from 802 SEC for sponsor ballot.

Moved by: John Kowalski, Second: Dick Eckard

No Discussion:

Motion passes: 8/0/1