

## IEEE P802.11 Wireless LANs

### Approved Minutes of the IEEE P802.11 Full Working Group

January 12-16, 2004

Hyatt Regency Vancouver, Vancouver, BC, Canada

### Joint 802.11 / 802.15 Opening Plenary: Monday, January 12, 2004

#### 1.1. Introduction

- 1.1.1. Meeting called to order by Stuart J. Kerry at 8:00AM.
  - 1.1.2. The agenda of the 83rd session of 802.11 is in doc: IEEE 11-03-965r2. This session is including 802.11, 802.15, 802.16, 802.18 RREG TAG, 802.19 Coexistence TAG, and 802.20 MBWA.
  - 1.1.3. Straw Poll: How many new members at this event? 45
  - 1.1.4. Secretary – Tim Godfrey
- Officers and Chairs of 802.11:

<p>Stuart J. Kerry IEEE 802.11 Chair Working Group</p> <p>+1 (408) 474-7356 stuart.kerry@philips.com</p>	<p>Al Petrick WG 1st Vice-Chair Attendance, Policies &amp; Voting</p> <p>+1 (321) 235-3423 apetrick@icefyre.com</p>	<p>Harry R. Worstell WG 2nd Vice-Chair Ballots &amp; Documentation</p> <p>+1 (973) 236-6915 hworstell@att.com</p>	<p>Tim Godfrey WG Secretary Minutes</p> <p>+1 (913) 706-3777 tgodfrey@globespanvirata.com</p>
<p>John Fakatselis TGe Chair MAC Enhancements - QoS</p> <p>+1 (321) 729-4733 jfakatselis@globespanvirata.com</p>	<p>David Halasz TGi Chair Enhanced Security Mechanisms</p> <p>+1 (330) 523-2067 dhalaz@cisco.com</p>	<p>Sheung Li TGj Chair 4.9 - 5 GHz Operation in Japan</p> <p>+1 (408) 773-5295 sheung@atheros.com</p>	<p>Richard H. Paine TGk Chair Radio Resource Measurement</p> <p>+1 (425) 865-4921 richard.h.paine@boeing.com</p>
<p>Bob O'Hara TGM Chair Standard Maintenance</p> <p>+1 (408) 635-2025 bob@airespace.com</p>	<p>Matthew B. Shoemake TGN Chair High Throughput</p> <p>+1 (214) 480-2344 m.b.shoemake@ieee.org</p>	<p>Clint Chaplin FR SG Chair (Interim) Fast Roaming / Fast Handoff</p> <p>+1 (408) 528-2766 cchaplin@sj.symbol.com</p>	<p>Lee Armstrong WAVE SG Chair Wireless Access for the Vehicular Environment (formerly DSRC)</p> <p>+1 (617) 244-9203 lra@tiac.net</p>
<p>Bruce P. Kraemer WNG SC Vice-Chair Wireless LANs Next Generation</p> <p>+1 (321) 729-5683 bkraemer@globespanvirata.com</p>	<p>Duncan Kitchen TGe Vice-Chair MAC Enhancements - QoS Assigned Numbers Authority (ANA) Lead</p> <p>+1 (503) 264-2727 duncan.kitchen@intel.com</p>	<p>Brian Mathews WG Publicity Chair Communications &amp; Reports</p> <p>+1 (321) 259-0737 brian@linux-wlan.com</p>	<p>Terry Cole WG Technical Editor Standard &amp; Amendment(s) Coordination</p> <p>+1 (512) 602-2454 terry.cole@amd.com</p>
<p>Teik-Kheong "TK" Tan WNG SC Chair Wireless LANs Next Generation</p> <p>+1 (408) 474-5193 tktan@philips.com</p>	<p>Correspondence to 802.11 Chair, IEEE 802.11 WG Philips Semiconductors, Inc., 1109 McKay Drive, M/S 48A SJ, San Jose, CA 95131-1706, USA. Fax: +1 (408) 474-5343</p>		

## 1.2. Policies and procedures

### 1.2.1. Al Petrick reviews document 802.11-00/278r9

- 1.2.1.1. The duties of the working group officers are reviewed, and the contact points for each working group are named.
- 1.2.1.2. Operating policies and procedures and their order of precedent are reviewed. 802.11 P&P are document 00/331r7. We use the latest edition of Roberts Rules of Order.
- 1.2.1.3. Rules for registration and payment of meeting fees are reviewed.
- 1.2.1.4. Rules for photos, audio taping, and media statements are reviewed
- 1.2.1.5. The electronic attendance recording system is reviewed. Contact information is maintained in the attendance system, and members are required to update for accuracy.
- 1.2.1.6. The rules for voting rights are explained. The attendance rules and participation requirements for gaining voting rights are explained.
- 1.2.1.7. The operational procedures for Task Groups and Study Groups are explained. New Participants orientation is in document 462r16
- 1.2.1.8. Membership and anti-trust rules are explained
- 1.2.1.9. Patent policies are explained. The following text was read to the members:

### IEEE-SA Standards Board Bylaws on Patents in Standards

#### 6. Patents

IEEE standards may include the known use of patent(s), including patent applications, provided the IEEE receives assurance from the patent holder or applicant with respect to patents essential for compliance with both mandatory and optional portions of the standard. This assurance shall be provided without coercion and prior to approval of the standard (or reaffirmation when a patent becomes known after initial approval of the standard). This assurance shall be a letter that is in the form of either

a) A general disclaimer to the effect that the patentee will not enforce any of its present or future patent(s) whose use would be required to implement the proposed IEEE standard against any person or entity using the patent(s) to comply with the standard or

b) A statement that a license will be made available without compensation or under reasonable rates, with reasonable terms and conditions that are demonstrably free of any unfair discrimination

This assurance shall apply, at a minimum, from the date of the standard's approval to the date of the standard's withdrawal and is irrevocable during that period.

Slide #1

Approved by IEEE-SA Standards Board – December 2002



### **Inappropriate Topics for IEEE WG Meetings**

- Don't discuss licensing terms or conditions
- Don't discuss product pricing, territorial restrictions or market share
- Don't discuss ongoing litigation or threatened litigation
- Don't be silent if inappropriate topics are discussed... do formally object.

**If you have questions,  
contact the IEEE Patent Committee Administrator  
at [patcom@ieee.org](mailto:patcom@ieee.org)**

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**Slide #2**

Approved by IEEE-SA Standards Board – December 2002



- 1.2.1.9.1. The copyright status of submissions is explained.

### **1.3. IP Statements**

- 1.3.1.1. Do any of the WG chairs (11,15, 16, 18, 19 need to be aware of any new IP statements?
  - 1.3.1.1.1. None
- 1.3.1.2. The chair asks if anyone has questions about the IP policy, or does not understand the IP policy.
  - 1.3.1.2.1. There are none.

### **1.4. Announcements**

- 1.4.1. The logistics for the Wednesday social are explained. It will be in the Fairmont.
- 1.4.2. The chair cautions members to be aware of their personal property. There have been cases where computers have been stolen.
- 1.4.3. We are monitoring the network for viruses. Computers with viruses will be removed from the network.
- 1.4.4. Members that are subscribed to email reflectors are responsible to update their addresses if they change. Bouncing email addresses will be removed from the lists.
- 1.4.5. It is members responsibility to log in and sign for attendance. You must bring any discrepancies to the WG officers' attention while at the meeting.
- 1.4.6. The WAVE Study Groups will also have off-site meetings for ASTM and other IEEE committees. These will be held at the Crowne Plaza Hotel.

### **1.5. IP Statements**

- 1.5.1. Texas Instruments has a patent related to Mesh Networking. The member identifying this patent is not an employee. The 802.11 Chair will contact TI.

### **1.6. Review of the agenda**

- 1.6.1. The WG chair reviews the joint agenda in 03/965r2
- 1.6.2. Is there any change to the agenda? None
- 1.6.3. Is there any objection to accept the agenda
  - 1.6.3.1. The agenda is accepted with unanimous consent

### **1.7. Review of Minutes from the previous meeting**

- 1.7.1. The two changes to the minutes from Albuquerque identified by the 802.11 chair (going from 03/853r0 to r1) are reviewed.
- 1.7.2. Are there any other changes to the minutes from any member? None.
- 1.7.3. The minutes are approved by unanimous consent

### **1.8. Review of wireless network and attendance system**

- 1.8.1. The 802wirelessworld.com server is available between the meetings on the Internet.
- 1.8.2. The procedures for using the attendance recording software are reviewed

- 1.8.3. There are 18 meetings, and 14 sessions must be recorded to obtain the 75% attendance requirement.
- 1.8.4. Voting members of 11, 15, 16, or 20 may be maintained by attending 802.18 sessions.
- 1.8.5. The procedures for submitting documents are reviewed.
- 1.8.6. The Working Group recommends that all members insure their computers have all service packs, virus protection programs, and personal firewall programs running at these meetings. At the last meetings there were 48 people with viruses on their machines.
  - 1.8.6.1. The WG chair notes that network staff will assist members that have difficulties
- 1.8.7. The voter status on the web site is incorrect. The software algorithm is still being developed, but is not going to report status correctly until the March meeting.
- 1.8.8. The Document system issued numbers in the 1000 range. The software is able to handle numbers above 1000, so no changes are needed. Some members were unable to request documents for certain study groups. If you have a DCN without the SG indication, delete the DCN and request a new one.

### **1.9. Review Interim meeting sessions**

- 1.9.1. We will discuss the meetings for May and September. These apply to 11, 15, 18, 19, and 20. Not for 802.16
- 1.9.2. May Meeting, Anaheim, Orange County. May 12-14<sup>th</sup>. This has been signed. This is the first non-hosted, non-802 sponsored meeting. IEEE will sponsor the meeting.
- 1.9.3. September Meeting. Week of September 13<sup>th</sup>. This has been planned for Berlin. Currently it appears that the meeting registration fee would be \$750-\$800.
  - 1.9.3.1. Straw Poll on member preferences:
    - 1.9.3.1.1. All those in favor of Berlin with a registration fee of \$750-800: 58 yes, 78 no, 78 don't care.
  - 1.9.3.2. Other options for September. Wentworth hotel in Sydney is available. The AU \$ is now very strong. Consequently, the registration fee would be \$700.
  - 1.9.3.3. Straw Poll on going back to Sydney: very few in favor
  - 1.9.3.4. September meeting in Hyatt Monterey. The Hyatt would provide a generous contribution to our account.
  - 1.9.3.5. Straw Poll for Monterey: 106 yes, 12 no.
  - 1.9.3.6. Straw Poll for San Diego.
  - 1.9.3.7. The group preference is for Monterey
  - 1.9.3.8. There is also a meeting of ITU in Geneva the same week. A request has been made to try and move the September meeting to September 20<sup>th</sup>. That would conflict with the WiFi alliance.
  - 1.9.3.9. International options have been rejected due to cost, we are an international organization. We can't reject international locations solely because of cost. There are countries that link their currency to the US dollar.
  - 1.9.3.10. 802.16 is meeting in China in May.

- 1.9.3.11. Each Working Group should conduct a formal vote on whether an international venue once a year should be an objective. This will be done in the Wednesday plenary sessions.

### **1.10. Financials Year To Date Summary**

- 1.10.1. We are now operating with a treasury, with a joint bank account between 802.11 and 802.15. 802.18 and 19 are also working with 802.11 and 802.15.
- 1.10.2. We are concluding the 2003 audit, and the Wireless groups bank account is open.
- 1.10.3. The May Meeting and September meetings are sponsored by this group.
- 1.10.4. Question to members of 802.18 – is there any objection for 802.11/15 to sponsor the meetings in May and September. No objections. The chair of 802.18 agrees.
- 1.10.5. Question to members of 802.19 – is there any objection for 802.11/15 to sponsor the meetings in May and September. No objections. The chair of 802.19 agrees.
- 1.10.6. Question to members of 802.20 – is there any objection for 802.11/15 to sponsor the meetings in May and September. No objections. The chair of 802.20 agrees.

### **1.11. Review of ExCom activities**

- 1.11.1. The details are in the minutes on the LMSC web site.

### **1.12. 802.11 Working Group Voters Summary**

- 1.12.1. Document 402r16
- 1.12.2. 469 voters, 136 nearly voters. Potentially 469 voters at this meeting. We went from 454 with 469 at the last meeting.

### **1.13. 802.11 Agenda**

- 1.13.1. The agenda for the weeks sessions is reviewed.
  - 1.13.1.1. There are new items for Wednesday. International venues, three chair votes (802.11n on Wednesday, Mesh Network SG chair, and WPP Study Group).
  - 1.13.1.2. Is there any objection to adopting the 802.11 agenda? None
  - 1.13.1.3. Approved with unanimous consent.
- 1.13.2. Matters arising from the Albuquerque 802.11 minutes
  - 1.13.2.1. The minutes are approved with unanimous consent
- 1.13.3. Documentation
  - 1.13.3.1. Be sure that any documents from other organizations that are uploaded are not confidential or copyrighted. 802 is not responsible for copyrighted materials that are placed on the servers.
- 1.13.4. TGe
  - 1.13.4.1. Closed recirculation ballot. We will continue to pursue Procedure 10 towards sponsor ballot. If that does not work, there will be another recirculation ballot
- 1.13.5. TGi
  - 1.13.5.1. We closed a sponsor ballot on December 20<sup>th</sup>. The sponsor ballot results for 802.11iD7 117, 15, 88% affirmative. 139 votes received. The

sessions of 802.11i will address 712 comments. The comments are in 04/1004

#### 1.13.6.

##### TGj

- 1.13.6.1. Letter ballot closes Wednesday this week. Members must vote. There have been some improperly formatted ballots submitted so far.

- 1.13.6.1.1. Discussion.

- 1.13.6.1.1.1. What is the required return ratio? It is 50% to be valid ballot.

- 1.13.6.2. There are some issues with the voter list. If you believe you have status, please vote, and submit a note.

#### 1.13.7.

##### TGk

- 1.13.7.1. Will be resolving comments on review of draft 0.9. There will be technical presentations, and hopefully a letter ballot. Signal Quality measures, and action frame security are the remaining issues. Teleconferences will continue.

#### 1.13.8.

##### TGm

- 1.13.8.1. Meeting Tuesday and Wednesday. Will address two interpretation requests. Will discuss the possibility of converting TGm from maintenance to a revision PAR. That would enable adding new functionality. A revision PAR would open the entire document to possible changes. These changes would be limited to minor changes.

#### 1.13.9.

##### TGn

- 1.13.9.1. Matthew Shoemake is resigning as the chair of TGn to pursue a new company. TGn is working on functional requirements and comparison criteria. Hopefully completed this week. The election will be in the 802.11 WG plenary.
- 1.13.9.2. Nominations for the chair of TGn. Nominations will close before the voting on Wednesday. Are there any nominations for the Chair?
  - 1.13.9.2.1. Garth Hillman nominates Bruce Kraemer,
  - 1.13.9.2.2. Henry Ptasisici nominates Chris Hansen
  - 1.13.9.2.3. Bill Carney nominates Sean Coffey.
- 1.13.9.3. The WG chair notes that each nominee will give a presentation, and answer questions.
- 1.13.9.4. The WG chair announces that 802.11 received an award from PC Magazine for 802.11g. The chair acknowledges Matthew Shoemake for his contributions to that standard.

#### 1.13.10.

##### SC WNG

- 1.13.10.1. There will be 5 sessions. Updates from MMAC and 802.18. Discussions on forming two new SGs. Wireless InterWorking, and Management of Wireless devices. There will also be a discussion on security.
- 1.13.10.2. The WG chair notes that if Bruce Kraemer is elected the chair of TGn, he will resign as the vice-chair of WNG.

#### 1.13.11.

##### SG Fast Roaming

- 1.13.11.1. The SG has a draft PAR and 5C. There will be motions and submissions on them. The SG will vote to approve the PAR and 5C to be forwarded to ExCom for approval.

#### 1.13.12.

##### SG Mesh Networking

- 1.13.12.1. Steve Connor is appointed as an interim chair until the elections this week.
- 1.13.12.2. The SG grew out of a tutorial last year. There have been extensive presentations on this topic in the WNG SG. This will be the first meeting of the Mesh SG. We will work on the PAR and 5C.

- 1.13.12.3. Nominations for the Chair of ESS Mesh Networking:
  - 1.13.12.3.1. Peter Ecclesine nominates Steve Connor
  - 1.13.12.3.2. Alistair Bata nominates Donald Eastlake.
- 1.13.13. **SG WAVE**
  - 1.13.13.1. The PAR and 5C were approved at the last meeting. Will prepare for becoming a task group. Reviewing tests and simulations. There was an announcement from the FCC regarding the allocation spectrum at 5.9GHz.
  - 1.13.13.2. The change of DSRC from WAVE has been shown to the ExCom and accepted. The change of name is editorial.
- 1.13.14. **SG Wireless Performance Prediction**
  - 1.13.14.1. Harry Worstell is the interim chair. This will be the first meeting of SG WPP. The agenda is in 04/041. Will elect a secretary. Will review the SG procedures, and conduct presentations in the SG time. There is one 4 hour session this week.
  - 1.13.14.2. Nominations for chair of WPP SG: None
- 1.13.15. **WG Technical Editor.**
  - 1.13.15.1. Terry Cole is not present. Al Petrick will run the editors meeting. All TG editors are required to attend on Tuesday morning.

#### **1.14. 802.15 Agenda**

- 1.14.1. 216 voters, 138 aspirant voters
- 1.14.2. There are no updates to Policies and Procedures
- 1.14.3. **TG 1a – Bluetooth update**
  - 1.14.3.1. Mapping BT 1.2 into 802.15.1. Will issue a letter ballot today.
- 1.14.4. **TG3 High Rate**
  - 1.14.4.1. TG3 will now meet tomorrow afternoon. Will look at maintenance issues on the TG3 standard. There is a maintenance SG forming to look at ongoing issues. There will be a published agenda. The new SG will be SG 3b
- 1.14.5. **TG3a**
  - 1.14.5.1. TG3a is in the down-select process. Will continue this week. There will be a confirmation vote this afternoon. If it doesn't pass there will be reset to two proposals.
- 1.14.6. **TG4a**
  - 1.14.6.1. Objectives are to finish analysis of application requirements, and approve PAR and 5C.
- 1.14.7. **SG 4b is looking at updates to 802.15.4. Will produce two projects. One to address new spectrum in Europe, and one project to deal with MAC issues in 802.15.4. Trials have brought new insight and experience, and corrections are needed.**
- 1.14.8. **SG5 Mesh Networking**
  - 1.14.8.1. Will look at what changes are needed to MACs and PHYs (802.15.3 and 802.15.4) to do mesh networking.
  - 1.14.8.2. Will there be any coordination with 802.11 mesh networking. The assumptions and requirements between 802.15 and 802.11 are very different.
- 1.14.9. **Millimeter Wave Interest Group**
  - 1.14.9.1. 60Ghz spectrum. Looking at generating an alternate PHY for 802.15. Will have presentations of contributions.



**1.15. Publicity**

- 1.15.1. Will have the joint 11/15 meeting tomorrow at 8:00. Will receive updates from industry groups.

**1.16. 802.16 Broadband Wireless Access**

- 1.16.1. Metropolitan Area Networks. Currently have 63 members, 24 potential.
- 1.16.2. Three activities this week
  - 1.16.2.1. 802.16-revD. A revision of the base standard published in 2001. Updating the entire standard and consolidating. In WG Letter ballot, going to Sponsor ballot.
  - 1.16.2.2. There is an amendment to support fixed and mobile terminals in the same system.
  - 1.16.2.3. Task Group C. conformance standards. Completed SB with 100% approval.
  - 1.16.2.4. Server is Mercury here and [www.wirelessMAN.org](http://www.wirelessMAN.org) on the Internet..
  - 1.16.2.5. There will be a process review meeting this week.

**1.17. 802.18**

- 1.17.1. In November, we approved two FCC filings and submitted them. Prepared letter to Chinese officials on WAPI. Gained consensus agreement on ITU-R contributions on protection mechanisms for RLAN. It has created a working document towards a PDNR.
- 1.17.2. Established a SG on sharing unused TV spectrum. Will meet Tuesday evening.
- 1.17.3. Objectives for this meeting – prepare documents, hold SG, and joint meetings with other groups as needed.
- 1.17.4. Discussion
  - 1.17.4.1. There are NPRMs from FCC policy task force. 108, 237, and 65. They are on cognitive radio concepts. These topics are on the agenda already. Will review to see if anything needs to be added.
- 1.17.5. Pending issues: interference temperature, smart radios,
- 1.17.6. ITU-R trends on UWB. FCC is trying to export US UWB rules to ITU-R, but there is resistance from other international bodies.
- 1.17.7. Japan presented on fixed wireless access and RLAN protection.
- 1.17.8. Chinese officials have proposed an arrangement that is felt to be unacceptable – limiting WAPI to Chinese companies, resulting in disclosure of IP to Chinese companies. The US Government is attempting to influence the issue.
- 1.17.9. Discussion
  - 1.17.9.1. The 03/65 FCC document is regarding receiver standards. 802.18 has filed comments on that.

**1.18. 802.19**

- 1.18.1. The coexistence group is focusing on internal interaction between wireless standards. 802.19 has appointed Steve

Shellhammer to replaced Jim Lansford who has resigned. Elections will be in March 2004.

1.18.2. Will develop proposals to modify LMSC procedures for developing new wireless standards. Will develop an IEEE guidelines for methodology for interference prediction, applying to all wireless groups. Will offer technical opinion on interference analysis of proposed new wireless standards.

1.18.3. Will develop PAR and 5C for methodology guidelines.

### **1.19. 802.20**

1.19.1. 802.20 is using 802wirelessworld electronic attendance. Policies and procedures have been posted.

1.19.2. The chair reviews an affiliation statement. There will be a manual sign-in procedure. It will be read in the 802.20 session.

1.19.3. The agenda for 802.20 is reviewed. There will be some changes in the 802.20 session times. There will be ad-hoc meetings Monday and Tuesday.

### **1.20. Announcements**

1.20.1. 802.11 members considering chairs or nominations should contact the 802.11 WG chair

1.20.2. Members are reminded to never leave items unattended in meeting rooms.

1.20.3. There will be an ad-hoc Executive meeting Monday night.

### **1.21. Closing**

1.21.1. The session is recessed until 10:30

## **2. Wednesday Plenary, January 14, 2004**

### **2.1. Opening**

2.1.1. The meeting is called to order at 10:40AM by Stuart J. Kerry.

2.1.2. The chair introduces the WG officers

2.1.3. There are 323 members in the room.

2.1.4. The agenda is according to 03/965r2.

2.1.4.1. New items on the agenda: 4.2, 4.3, 4.4 and 4.5. TG and SG chair elections. Votes on international venues.

### **2.2. Announcements**

2.2.1. Straw poll of new people at this meeting – about 20

2.2.2. Straw poll of those attending the Social? 207

2.2.3. Who will be at the closing plenary on Friday? 163

2.2.4. Electronic Attendance issues – those who were unable to sign in yesterday. There will be a window of time tonight from 6:00PM to midnight to allow everyone to update their attendance for Tuesday. If there are issues for Monday, see Al Petrick.

2.2.5. Members have reported incorrect attendance records for November. This will be fixed and updated this afternoon.

- 2.2.6. There are two “tiger teams” that have been started from the CAC on Sunday to address streamlining the process (Brian Mathews) of our operations and creating standards. There is another team for look a the education of secretaries and chairs to help with uniformity of TG operations led by Harry Worstell.
- 2.2.7. Task Group M has had a difficult time gathering enough members to make progress. Please attend if you can assist.
- 2.2.8. The chair of ESS mesh SG announces that the PAR and 5C have been approved and will be brought to the WG on Friday.
- 2.2.9. The chair of Fast Roaming SG announces that the PAR and 5C have been approved and will be brought to the WG on Friday

### **2.3. IP Statements**

- 2.3.1. The chair asks if there are any new IP statements? None
- 2.3.2. The chair asks if everyone is aware of the IP policy. Does anyone need further clarification? None

### **2.4. Agenda**

- 2.4.1. The agenda with updates is adopted with unanimous consent.

### **2.5. Liaison Reports**

- 2.5.1. 802.11 to 802.1 – no report
- 2.5.2. 802.11 to 802.15 – no report
  - 2.5.2.1. Mike Seals steps down as Liaison
- 2.5.3. 802.11 to 802.15.3a – no report
- 2.5.4. 802.11 to 802.18 – Denis Kuahara
  - 2.5.4.1. Report in document 18-04-0002-00-0000-rr-tag-liaison-report.ppt
  - 2.5.4.2. Brazil Public Consultation – Motion on Friday
  - 2.5.4.3. FCC NOI/NPRM on “Interference Temperature” (ET Docket No. 03-237)
  - 2.5.4.4. FCC NPRM on “Smart Radios” (ET Docket No. 03-108)
  - 2.5.4.5. TV Spectrum Re-Use Study Group – will continue Thursday evening.
  - 2.5.4.6. The FCC is considering re-defining DFS/TPC beyond what was in WARC.
- 2.5.5. 802.11 to WiFi Alliance – no update
- 2.5.6. 802.11 to JEDEC JC-61 – Tim Wakeley
  - 2.5.6.1. JC61 met last week. There are 43 member companies.
  - 2.5.6.2. The committee approved the BB-RF draft standard and was submitted to JEDEC. Expect final approval early February.
  - 2.5.6.3. Next phase is interoperability and compatibility recommended practice.
  - 2.5.6.4. Next meeting before March meeting in Orlando
- 2.5.7. 802.11 to CableLabs – no report
  - 2.5.7.1. Third Call
- 2.5.8. 802.11 to IETF – Dorothy Stanley
  - 2.5.8.1. Report in 04/117
  - 2.5.8.2. There are no longer any document dependencies between 802.11i and IETF. There is one dependency through 802.1x
  - 2.5.8.3. EAP keying – there are activities going on in IETF.

- 2.5.8.4. Formation of CAPWAP group. A draft is available.
- 2.5.8.5. RADIUS extension working group may be formed this year.
- 2.5.8.6. An IRTF working group is being formed (IP Mobility Optimizations)
- 2.5.8.7. Discussion
  - 2.5.8.7.1. The 802 ExCom met with IETF yesterday. Paul Nicolich (802 chair) has been taking this on
- 2.5.9. **802.11 to MMAC - Yasuhiko Inoue**
  - 2.5.9.1. Report in 04-0099r0
  - 2.5.9.2. MMAC (Multimedia Mobile Access Communication Systems Promotion Council)
  - 2.5.9.3. Activities:
    - 2.5.9.3.1. Investigation and study on system specifications, Standardization
    - 2.5.9.3.2. MMAC makes some of the Japanese standard for radio communication systems including ARIB STD T-71
    - 2.5.9.3.3. Demonstrative experiment
    - 2.5.9.3.4. Information exchange and popularization activities, etc
  - 2.5.9.4. Committees
    - 2.5.9.4.1. High Speed Wireless Access Committee (HiSWAN, CSMA)
    - 2.5.9.4.2. Wireless Home-Link Committee (Wireless 1394, UWB)
  - 2.5.9.5. T71 Ad hoc WG
    - 2.5.9.5.1. Mission: Maintenance of ARIB STD-T71. ARIB STD-T71: IEEE 802.11a compatible WLAN system
    - 2.5.9.5.2. Plans - Revision of the ARIB STD-T71: Addressing compatibility with the IEEE 802.11j standard is desired by the member companies of T71 Ad hoc WG.
  - 2.5.9.6. Information Council of the MPHPT is studying the possibility of allocating a new frequency band for WLAN/Wireless Access systems. 5.470 – 5.725 GHz and 5.250 – 5.350 GHz (for FWA services?)
  - 2.5.9.7. Discussion
    - 2.5.9.7.1. Is the 5.47 band being considered for mobile or fixed? Yes, both.

## 2.6. **Old Business**

- 2.6.1. Network Virus Protection Policy
  - 2.6.1.1. We have not had virus problems at this meeting. Only two have been kicked off the network.

## 2.7. **TGn Chair Elections**

- 2.7.1. Nominees: Bruce Kraemer, Sean Coffey, Chris Hansen
- 2.7.2. Sean Coffey withdraws nomination.
- 2.7.3. The chair asks: Are there any other nominations? There are none. The nominations are closed.
- 2.7.4. We are following the policies and procedures for elections. Each candidate will come forward for 5 minutes to speak on qualifications and sponsorship and vision for the task group. Then there will be 5 minutes of Q&A for each candidate.
- 2.7.5. The chair states that members who do not have their tokens will be on the honor system. The chair will allow standing votes of voting members regardless of possession of the token.
- 2.7.6. This is a simple majority vote.

- 2.7.7. Is everyone clear on the process? No Questions. Are the candidates clear on the process? Yes.
- 2.7.8. The chair states he will abstain. The current TGn chair will also abstain.
- 2.7.9. The first candidate to speak is selected by random drawing of lots. Bruce Kraemer is drawn as the first speaker.
- 2.7.10. Bruce Kraemer presents his qualifications, role, philosophy, support, and dedication to the chairmanship of TGn. He states he will withdraw as the WNG vice-chair if elected to the chair of TGn.
- 2.7.11. Chris Hansen presents an overview of his activities in 802.11, qualifications, support, history in the industry. Believes 802.11n will be the most important task group because it is the future. Appreciates the technical contributors and will focus on moving the process forward fairly and effectively.
- 2.7.12. Question and Answers.
  - 2.7.12.1. Q&A to Chris – none
  - 2.7.12.2. Q&A to Bruce
    - 2.7.12.2.1. What about the co-chair? Intention is to step down from vice-chair of WNG. There is overlap between sessions, so that cannot continue as chair of TGn.
- 2.7.13. Vote: Bruce Kraemer: 161 Chris Hansen: 16 Not Voting: 18
- 2.7.14. The WG chair announces that Bruce Kraemer is now Task Group N chair.
- 2.7.15. Bruce Kraemer formally resigns as WNG Vice-Chair
- 2.7.16. The current chair of TGn is comfortable transitioning at this point. The official chairmanship changes to Bruce Kraemer at the end of the meeting on Friday.

## **2.8. *ESS Mesh Networking Study Group Chair Election***

- 2.8.1. Nominees are Steve Connor and Donald Eastlake
- 2.8.2. The WG chair asks for any further nominations. There are none.
- 2.8.3. The nominations are closed.
- 2.8.4. The candidates select their speaking order by the drawing of random lots.
- 2.8.5. Donald Eastlake presents an overview of his experience in the industry and in standards processes. Has background in the IETF and has chaired working groups there. Has published numerous RFCs, and has worked in ANSI. Sees the role of the chair to assure both fairness and making progress while following the rules. Has full support of employer.
- 2.8.6. Steve Connor presents an overview of his qualifications. Has worked in mesh networking for 3 years. Has support of employer to participate. Intends to run as task group chair when it is formed. Was the leader of discussion in the WNG to form this SG.
- 2.8.7. Questions and Answers
  - 2.8.7.1. Q&A for Steve Connor – None

2.8.7.2. Q&A for Donald Eastlake – None

2.8.8. Vote: Steve Connor: 58 Donald Eastlake: 75 Not voting:

2.8.9. The chair declares the Donald Eastlake is the ESS Mesh Study Group chair.

2.8.10. Steve Connor will remain interim chair until the end of the week.

## **2.9. Wireless Performance Prediction (WPP) SG Chair Election**

2.9.1. Are there any nominations for the chair?

2.9.1.1. Bobby Jose nominates Thomas Alexander

2.9.1.2. Roger Durand nominates Charles Wright

2.9.2. The order of presentations is selected by random drawing.

2.9.3. Thomas Alexander presents his qualifications and experience. Have been involved with ANSI, ATM forum and IEEE standards. Have been working in 802.3 and 802.17. Familiar with 802.11 process. Has full support of sponsor.

2.9.4. Charles Wright presents his qualifications and experience. Has been involved in 802.11 for 2 years, with longer experience in wireless. Has long term vision for wireless performance prediction, and wishes to define the terms necessary to make it possible. Has support of sponsor company. Has the ability to be fair and impartial when leading the group.

2.9.5. The chair announces that the nominations are now closed.

2.9.6. Questions for Charles – none

2.9.7. Questions for Tom – none

2.9.8. The WG chair will not vote in this election

2.9.9. Vote: Thomas Alexander: 17 Charles Wright: 68 Not Voting: 57

2.9.10. Charles Wright is the chair of the WPP Study Group.

## **2.10. Interim Session Venues**

2.10.1. Discussion on whether we should hold one international meeting venue (Not in North America) per year.

2.10.1.1. The intent was expressed that we need to maintain an international presence in both Asia as Europe from time to time. Suggest that since other options were also expensive, we should re-consider going to Berlin.

2.10.1.2. It is important since IEEE has Sector Membership in ITU, we must appear as an international organization, with one international meeting per year. We need to avoid an ITU-R meeting conflict with dates of the meetings.

2.10.1.3. In the 802 rules it mentions international venues, but appears to use Canada. In the 802.11 rules we do not have an official position on international meetings. The ExCom does intend to have a truly international meeting in 2005.

2.10.1.4. It is very important to have international events to maintain our credibility.

2.10.1.5. In the TGn channel models some European members were unable to attend.

- 2.10.1.6. There are places where the dollar is not at an unfavorable exchange rate. We also have to consider visa issues for some members.
- 2.10.1.7. If Plenaries are international we should alternate Europe and Asia as locations for our Interims.
- 2.10.1.8. Also believes that events should be split between Europe and Asia. Suggests that international venues be mixed between Interim and Plenary meetings
- 2.10.1.9. Motion ID 468
- 2.10.2. Vote: Members in favor of holding at least one international interim session per year: Motion passes: 106:5:11
- 2.10.3. Vote for September 2004 Venue. Sydney: 37 Berlin: 78 None of the above: 14
- 2.10.4. These votes will be combined with other working groups to make the final selection.

### **2.11. Recess at 12:30**

## **3. Closing Plenary, Friday, January 16, 2004**

### **3.1. Opening**

- 3.1.1. The meeting is called to order at 8:10 by Stuart J. Kerry.
- 3.1.2. The agenda is in 03/965r2.

### **3.2. Agenda**

- 3.2.1. The agenda is accepted with unanimous consent.

### **3.3. Announcements**

- 3.3.1. The WG chair notes that members may avoid queues at the airport by paying the tax in advance of checking in.
- 3.3.2. The 802 handoff executive committee study group will be replaced by 802.21 at the next meeting. Discussion of cooperation with 802.11 will be discussed.
- 3.3.3. The WG chair asks if 802.21 has a position for interim meetings. 802.21 will locate with the wireless groups as a default. Their membership would like to join the wireless groups in Berlin.
- 3.3.4. The chair of 802.21 (DJ) states that his group would like to have the 802.11 and 802.15 groups host the September 2004 meeting in Berlin.
- 3.3.5. CAC members are reminded to review the CAC date information in the tentative agenda Excel document.

### **3.4. IP Statements**

- 3.4.1. Are there any new IP statements for the chair? None
- 3.4.2. Is everyone aware of the IP policy of the IEEE? There are none with questions.

### **3.5. Documentation**

- 3.5.1. Members are still not getting the formatting correct . We will put templates on the 802wirelessworld.com site.

- 3.5.2. Members are reminded that the old format for the file number is still used (not the file naming DCN).
- 3.5.3. Also, company logos are not allowed on document submissions. Such documents will be removed.

### **3.6. Task Group Reports**

#### **3.6.1. TGe – John Fakatselis**

- 3.6.1.1. Report in doc 04/148
- 3.6.1.2. LB 64 results had 372 comments, 243 were technical
- 3.6.1.3. All have been resolved.
- 3.6.1.4. We will conduct a new recirculation ballot
- 3.6.1.5. We have 29 no votes currently with over 90% approval.
- 3.6.1.6. Meeting announcement. There will be a TGe interim the week of February 16<sup>th</sup>, based on authorization at the last plenary meeting. It will be for recirculation or promoting a draft to sponsor ballot, depending on the results of this new ballot.
- 3.6.1.7. The location for the interim meeting is in Briarcliff New York at the Philips facility.
- 3.6.1.8. Discussion
  - 3.6.1.8.1. The interim meetings are Ad-hoc, and votes will be reconfirmed? No, the purpose is to send ballots to a recirculation ballot.
  - 3.6.1.8.2. The Plenary group authorized 802.11e to conduct an interim meeting and issue a new ballot.
  - 3.6.1.8.3. The meeting announcement meets the requirements of openness.
  - 3.6.1.8.4. Notes that the WG chair may issue a letter ballot on his own at any time for any reason. He could decide to issue a LB after an interim meeting if he desires.
  - 3.6.1.8.5. Harry Worstell requests the chair to make a ruling
  - 3.6.1.8.6. The WG chair notes that this is not the point in the agenda for this and it will be brought up in the new business.

#### **3.6.2. TGi – Dave Halasz**

- 3.6.2.1. Report in document 04/163r0
- 3.6.2.2. the chair moves to Al Petrick
- 3.6.2.3. There are still comments left to resolve, so the group will not conduct a sponsor recirculation ballot following this meeting.
- 3.6.2.4. In November, TGi passed a motion to empower the conducting of interim meetings, conducting ballots, and teleconferences
- 3.6.2.5. There is a meeting scheduled for February 18-20 in Austin TX. The purpose will be to send a ballot to Sponsor Recirculation
- 3.6.2.6. There will be a teleconference on February 9<sup>th</sup>.
- 3.6.2.7. The chair moves to Stuart J. Kerry

#### **3.6.3. TGj – Sheung Li**

- 3.6.3.1. Report in 04/164r0
- 3.6.3.2. Cannot announce results of LB64. The voting status of some voters is still in question.
- 3.6.3.3. Therefore, motions based on LB64 will be conditional.
- 3.6.3.4. Presented Document 04/80r0 to Excom regarding progress of the Task Group for the purpose of initiating procedure 10.
- 3.6.3.5. Will have motions to empower comment resolutions and conducting ballots.
- 3.6.3.6. Discussion



3.6.3.6.1. If the letter ballot is not closed, how can all the comments be resolved? The LB is closed, and all comments have been addressed. Only the voting status of the membership is in question.

3.6.3.6.2. The WG chair will issue official results early next week.

#### 3.6.4. TGk – Richard Paine

3.6.4.1. Report in document 04/165r0

3.6.4.2. 215 comments out of 324. Worked on integration of 11h mechanisms into 11k.

3.6.4.3. Remaining issues – signal quality measures, and security of measurement frames.

3.6.4.4. Objectives for March: finish comment resolutions, and prepare draft for review or letter ballot.

3.6.4.5. Teleconferences will continue on a weekly basis.

#### 3.6.5. TGM – Bob O'Hara

3.6.5.1. Report in document 04/029r0

3.6.5.2. Processed 2 interpretation requests (status and reason codes, and ANA assigned elements).

3.6.5.3. The TGM responses will be forwarded to the WG for approval in new business.

3.6.5.4. The TG discussed changing the TGM PAR from maintenance to revision. This would enable adding additional functionality to the standard. Document 04/058 contains a proposal to modify the PAR. That was approved in TGM, and will be brought to the WG for approval.

3.6.5.5. Further items under consideration are in document 03/619r2

3.6.5.6. Discussion

3.6.5.6.1. What are the changes to the PAR in document 04/058? It removes the technical and editorial corrections restrictions, and allows addition of minor functionality improvements in response to interpretation requests.

3.6.5.6.2. Does this open the entire document for changes? The revision PAR on its own allows any changes, unless the scope is limited. This PAR does set limits.

3.6.5.6.3. 802.11-1999 is a revision to 802.11-1997. This Task Group will conduct similar work. Revisions can incorporate things that are not part of other PARs, such as vendor specific information.

3.6.5.6.4. There is a regional standards body in China that has been allocating elements without coordination with 802.11. TGM has considered this, but we are responsible for this standard and don't have to accommodate any other organizations incorrect use.

3.6.5.6.5. The PAR allows including changes that are submitted directly to the 802.11 working group.

3.6.5.6.6. Should the Working Group approach China about these issues? Yes, this is one of a number of issues that will be taken up by the working group as a whole.

#### 3.6.6. TGn – Bruce Kraemer (chair elect)

3.6.6.1. Report in document 04/151r0

3.6.6.2. Objectives for January were to complete the selection process.

3.6.6.3. There were 24 presentations, which are listed in 04/079

3.6.6.4. The procedure selection process is still under discussion

3.6.6.5. We worked on the comparison criteria document.

- 3.6.6.6. We are not ready to release the call for proposals. The work will continue in March.
- 3.6.6.7. The FRCC will continue teleconferences.
- 3.6.6.8. A Simulation ad-hoc group will be formed.
- 3.6.6.9. Discussion
  - 3.6.6.9.1. The TGM 03/619 file is in the /11/03 directory.
- 3.6.7. **Publicity – Brian Mathews**
  - 3.6.7.1. The joint standing committee met on Tuesday. Received updates from industry groups, reviewed text for the 802news web site. Discussed policies and procedures.
  - 3.6.7.2. The WG chair notes that the 802 chair will draft a policy.
- 3.6.8. **WNG – T.K Tan**
  - 3.6.8.1. Report in document 04/024r1
  - 3.6.8.2. Conducted discussions of justifications of study groups, leading to 4 motions.
  - 3.6.8.3. Received update from Regulatory.
  - 3.6.8.4. Had a presentation from TGk
  - 3.6.8.5. Had an update on the 6 European framework on Wireless LANs. Will form a liaison.
  - 3.6.8.6. Orlando objectives – will provide updates from standards bodies. New topics: MMwave WLANs, next generation WLANs, Korean spectrum allocation, update on European framework.
- 3.6.9. **FRCC – Clint Chaplin**
  - 3.6.9.1. Report in 04/162r0
  - 3.6.9.2. Voted to accept PAR and 5C.
  - 3.6.9.3. Presentation on measuring roaming times.
  - 3.6.9.4. Will address comments on PAR and 5C in March.
- 3.6.10. **Mesh Networks SG – Steve Connor**
  - 3.6.10.1. report in 04/101r0
  - 3.6.10.2. Approved PAR and 5C, will have WG motion for approval to come.
  - 3.6.10.3. In March, will resolve comments from 802 WG's on the PAR and 5C. Start technical presentations on requirements and architecture.
  - 3.6.10.4. Discussion
    - 3.6.10.4.1. When will the ExCom consider the PAR and 5C? It will be on the Friday of the March Plenary meeting week.
  - 3.6.10.5. The WG chair thanks Steve Connor for his contributions as SG chair.

### 3.7. **Motions**

#### 3.7.1. TGe

- 3.7.1.1. Moved: Enable the editor to produce 802.11e draft 7.0 based on the comment resolutions in 04/1001r6 and Authorize a 15-day LB recirculation of 802.11 TGe draft 7.0 to conclude no later than 02/15/2004.
  - 3.7.1.1.1. Moved John Fakatselis on behalf of TGe
  - 3.7.1.1.2. Motion ID 469
  - 3.7.1.1.3. Vote: Motion passes 103 : 0 : 4
- 3.7.1.2. Returning to the pending issue regarding the interim meeting.
- 3.7.1.3. The TG chair states that the decision was made at the Plenary. It would require a quorum and a motion to rescind the previous motion. Requests the WG chair to uphold the previous meetings' decision.
- 3.7.1.4. The WG chair states that there is no ruling necessary.

- 3.7.1.5. The concern of the member regarding the procedure is formally noted. The WG chair will address the concern with the 802 chair.

### 3.7.2. TGi

- 3.7.2.1. Move to request that the chair of IEEE 802.11 do the necessary editorial and formatting changes required and submit document 04/0160r1 as an IETF Internet Draft and request publication as an IETF Informational RFC.

- 3.7.2.1.1. Moved Dave Halasz on behalf of TGi

- 3.7.2.1.2. Discussion

- 3.7.2.1.2.1. the IETF requested we send the information back in this form.

- 3.7.2.1.3. Motion ID 470

- 3.7.2.1.4. Vote: motion passes 94 : 0 : 6

### 3.7.3. TGj

- 3.7.3.1. Believing that comment responses in the document mentioned below and the draft mentioned below 802.11j draft 1.2 demonstrate that the WG 802.11 LB rules have reached an orderly endpoint, approve comment responses in 11-04/42R4

- 3.7.3.1.1. Moved Sheung Li on behalf of TGj

- 3.7.3.1.2. Motion ID 471

- 3.7.3.1.3. Vote: motion passes 73 : 2 : 20

- 3.7.3.2. Believing that comment responses in 11-04/42R4 satisfy WG 802.11 rules for letter ballot recirculation and that a recirculation will likely result in approval of the draft, Authorize a 30-day LB recirculation of 802.11j draft 1.3 to conclude no later than March 10, 2004 and request approval of a SB for draft 1.3 by ExCom using Procedure 10 conditional upon an approval of draft 1.2 in letter ballot 64.

- 3.7.3.2.1. Moved Sheung Li on behalf of TGj

- 3.7.3.2.2. Motion ID 472

- 3.7.3.2.3. Vote: Motion passes 76 : 0 : 6

- 3.7.3.3. Empower TGj to hold meetings beginning in January 2004 as required to conduct business necessary to progress the re-circulation ballot and sponsor ballot process, including creating and issuing drafts for recirculation and sponsor balloting, conducting teleconferences, and handling other business necessary to progress through the IEEE standards process

- 3.7.3.3.1. Moved Sheung Li on behalf of TGj

- 3.7.3.3.2. Discussion

- 3.7.3.3.2.1. This motion gives carte blanche to the Task Group. Would prefer the TG come to these meetings and specify the time and place of any. If more time is needed, there should be more Interim meetings of the working group.

- 3.7.3.3.2.2. What kind of meetings are being requested? Ad Hoc? The TG chair notes that 30 days notice for any ad-hoc or interim meetings or phone calls.

- 3.7.3.3.2.3. There is a 30 day notice requirement. Also a task group cannot send a draft to sponsor ballot. Request the chair to help make this procedurally correct.

- 3.7.3.3.2.3.1. The chair does not recognize the request

- 3.7.3.3.2.4. It is not appropriate to enable an interim meeting at an interim meeting. Request the WG chair to rule it out of order.

- 3.7.3.3.2.4.1. The chair chooses not to recognize the request.

- 3.7.3.3.2.5. What is the end date for this empowerment?  
Until the March meeting – the TG chair would support an amendment to that effect.
- 3.7.3.3.2.6. The WG chair requests the body to stand by as he holds a short consultation with the vice-chairs and task group chair.
- 3.7.3.3.2.7. The WG chair states that this motion and related debate will be moved into New Business on the agenda, and there will be further consultation between now and then with ExCom members

### 3.7.4. TGk

- 3.7.4.1. Move to empower TGk to hold meetings as required to conduct business necessary to progress the Letter Ballot process, including creating and issuing drafts for Letter Ballots, conducting teleconferences, and handling other business necessary to progress through the IEEE standards process.
  - 3.7.4.1.1. Moved Richard Paine on behalf of TGk
  - 3.7.4.1.2. Discussion
    - 3.7.4.1.2.1. Didn't we empower TGk in November? It only empowered teleconferences.
    - 3.7.4.1.2.2. This does not specify an end date? It isn't meant to. We still have rules to announce meetings.
    - 3.7.4.1.2.3. The WG chair rules that the motion shall be modified to include a limit of the duration to 30 days after the March meeting.
- 3.7.4.2. Move to empower TGk to hold meetings as required until 30 days after the close of the March 2004 plenary session, to conduct business necessary to progress the Letter Ballot process, including creating and issuing drafts for Letter Ballots, conducting teleconferences, and handling other business necessary to progress through the IEEE standards process.
  - 3.7.4.2.1. Discussion
    - 3.7.4.2.1.1. The 30 days notice would enable meetings every 2 weeks, which would be overly burdensome to the membership. Asks the chair to review the process again.
    - 3.7.4.2.1.2. Don't we need a motion to amend?
    - 3.7.4.2.1.3. Even with 30 days notice and empowerments, there is still a potential for conflict between the multiple task group interim meetings.
    - 3.7.4.2.1.4. The WG chair notes that this topic should be addressed by the CAC.
    - 3.7.4.2.1.5. Regarding the comment that this interim session is less empowered. According to our P&P, an interim meeting is fully empowered equivalent to a plenary meeting.
    - 3.7.4.2.1.6. Is there any objection to the WG chair making the amendment to the motion on the floor.
      - 3.7.4.2.1.6.1. None
  - 3.7.4.2.2. Motion ID 475
  - 3.7.4.2.3. Vote: Motion passes 67 : 4 : 20
- 3.7.4.3. The chair calls a meeting of the CAC members at the table during the break.

### 3.7.5. TGm

- 3.7.5.1. Motion: to request the working group to accept and forward the interpretation response contained in document 04-69r0 to Linda Gargiulo at the IEEE office as the official response of the 802.11 working group.
  - 3.7.5.1.1. Moved Bob O'Hara on behalf of TGm
  - 3.7.5.1.2. The motion is approved by unanimous consent
- 3.7.5.2. Motion: to request the working group to accept and forward the interpretation response contained in document 04-70r0 to Linda Gargiulo at the IEEE office as the official response of the 802.11 working group.
  - 3.7.5.2.1. Moved Bob O'Hara on behalf of TGm
  - 3.7.5.2.2. The motion is approved by unanimous consent
- 3.7.5.3. To adopt document 04/58r1 as the revised PAR for 802.11ma and submit it to the 802 Executive Committee no less than 30 days prior to the March 2004 802 plenary session.
  - 3.7.5.3.1. Moved Bob O'Hara on behalf of TGm
  - 3.7.5.3.2. Discussion
    - 3.7.5.3.2.1. Requests a short summary of what is changed. There are changes to dates, the title. The purpose is changed to include rolling up amendments approved up to 6 months after the approval of this PAR, into one monolithic document. The current 2003 re-affirmed document is not an approved standard.
    - 3.7.5.3.2.2. When we set up TGm, it was for maintenance and revision. Why not open a new PAR for revision, and leave the existing PAR? The advantage is having a single set of meetings. We already have difficulty getting enough people to participate
  - 3.7.5.3.3. Motion ID 476
  - 3.7.5.3.4. Vote: Motion passes 86 : 0 : 9
- 3.7.6. Recess for 30 minute break at 10:00
- 3.7.7. TGn
  - 3.7.7.1. No Motions
- 3.7.8. Publicity
  - 3.7.8.1. No Motions
- 3.7.9. WNG
  - 3.7.9.1. Move that the IEEE 802.11 Working Group form a Study Group for Wireless InterWorking with External Networks.
    - 3.7.9.1.1. Moved Harry Worstell on behalf of WNG
    - 3.7.9.1.2. Discussion
      - 3.7.9.1.2.1. This work fits nicely with the work of 802.21.
    - 3.7.9.1.3. Motion ID 477
    - 3.7.9.1.4. Vote: Motion passes 58 : 0 : 25
    - 3.7.9.1.5. The WG chair notes that this is contingent on Executive Committee approval at the next plenary
  - 3.7.9.2. Move to recommend that the IEEE 802.11 WG chair form a Wireless LAN Security standing committee as described in document 11-04/008r3.
    - 3.7.9.2.1. Moved Harry Worstell on behalf of WNG
    - 3.7.9.2.2. Discussion
      - 3.7.9.2.2.1. What is the view of the existing TGi task group? The TGi chair has left – a member gives the view that this would try and maintain security as new amendments are added. It is not maintenance to TGi.

- 3.7.9.2.2.2. It may be too early to ask for a new security committee since the current security committee has not completed its task.
- 3.7.9.2.2.3. There is widespread sentiment within TGi that the TG cannot accommodate the needs of every new task group that needs security functionality. Other task groups need to ensure that new features they add address security issues. Favors this committee to allow the accumulation of expertise to assist task groups in these issues and requirements.
- 3.7.9.2.2.4. Now that TGi is in Sponsor Ballot, the TG would not consider new tasks. It is too late for new work.
- 3.7.9.2.2.5. Against this motion. Despite the expertise that has been gathered, it seems strange to have a standing committee on security. It would be cumbersome. The work will be done in task groups. The security community should engage with the appropriate task groups.
- 3.7.9.2.2.6. In favor – we do need a core of people with expertise. 802.11 has been burned in the security area with WEP. 802.11k currently has issues that the TG needs help with. TGi has been unable to help. We need a mechanism to address this situation.
- 3.7.9.2.2.7. Call the question
  - 3.7.9.2.2.7.1. Harry W / Peter E
  - 3.7.9.2.2.7.2. The question is called without objection
- 3.7.9.2.3. Motion ID 480
- 3.7.9.2.4. Vote: The motion passes 59 : 4 : 32
- 3.7.9.2.5. The WG chair will take this action to the CAC.
- 3.7.9.3. Move to request the IEEE 802.11 Working Group to form a Wireless Network Management Study Group for the purpose of evaluating methods to securely enable external network management entities (managed service providers, company IT personnel, hot spot providers, applications developers, etc.) to extend the management of the wired networks through to the wireless extension attached to those networks. Once evaluated, it is expected that a PAR and a 5 Criteria document will be written and submitted to the IEEE 802.11 Working Group so that a Task Group can be formed.
  - 3.7.9.3.1. Moved Harry Worstell on behalf of WNG
  - 3.7.9.3.2. Discussion
    - 3.7.9.3.2.1. Elaborate on the purpose of extending the management of the wired network to the wireless? It is both client and AP devices – power, loading, etc. Currently it is proprietary. We need a standard.
    - 3.7.9.3.2.2. Aren't these manageable through the MIB? No, there is no standard.
    - 3.7.9.3.2.3. Please expand on why this is different than TGk? This is an adjunct. TGk provides the measurements to higher layers. This provides a way for higher layers to manage back down to the devices.
    - 3.7.9.3.2.4. Elaboration for the use of the term “securely”. This is just the issues – the PAR and 5C will define the work to be done. It is not necessarily chartering this group to work on security per-se. But security is an overriding requirement to be considered.
    - 3.7.9.3.2.5. Against the motion – we have existing mechanisms for management and systems. The MIB

interface does that, which is fully specified in every amendment to the 802.11 standard.

3.7.9.3.2.6. Why not just modify the PAR of TGk? Because we need to get TGk done. It was intentionally broken into two pieces.

3.7.9.3.2.7. The WG chair notes that references to the security standing committee mentioned in the previous discussion was an action for the chair, and not directly approved.

3.7.9.3.3. Motion ID 481

3.7.9.3.4. Vote: motion passes 41 : 8 : 45

3.7.9.3.5. This motion will be forwarded to the ExCom for approval.

3.7.9.4. IEEE 802.11 WNG SC requests that 802.11 working group chair establishes a liaison with the chair of European 6th Framework.

3.7.9.4.1. Moved Harry Worstell on behalf of WNG

3.7.9.4.2. Discussion

3.7.9.4.2.1. What is the European 6<sup>th</sup> framework? It is a 4-billion euro investment in advanced technology. It will investigate the evolution of the future of wireless technology including wireless LAN.

3.7.9.4.3. Motion is approved with unanimous consent.

### 3.7.10. Fast Roaming Study Group

3.7.10.1. Believing the PAR & 5 Criteria contained in the documents below meet IEEE-SA guidelines, Request that this PAR & 5 Criteria contained in 11-03/771R5 & 11-03/772R4 be posted to the ExCom agenda for WG 802 preview and ExCom approval (and subsequent submission to NesCom).

3.7.10.1.1. Moved Clint Chaplin on behalf of FRSG

3.7.10.1.2. Vote: motion passes 65 : 0 : 27

### 3.7.11. MESH SG

3.7.11.1. Move to have the Working Group approve the PAR and 5 Criteria for IEEE 802.11 ESS Mesh contained in documents 11-04/0054r2 and 11-04/0056r1 and to forward them to the IEEE 802 ExCom and subsequently NesCom for approval.

3.7.11.1.1. Moved Steve Connor on behalf of MESH SG

3.7.11.1.2. Discussion

3.7.11.1.2.1. This is not the proper PAR. It wants to create a specific ion for a distribution system using mesh technology. An amendment to 802.11 cannot accomplish this. The right way is to create a separate specification of a mesh distribution system. Would be better to continue as a SG until the work is properly specified.

3.7.11.1.2.2. Would like to clarify that the scope of the PAR does include amending the 802.11 standard to allow efficient use of 802.11 to extend connectivity. The wording of the PAR does allow for interfacing to higher layer protocols, including higher layer distribution protocols.

3.7.11.1.2.3. In favor – the work is bounded and achievable. It is at layer 2 – some MAC changes would be needed for stations that forward frames. It is an appropriate amendment for 802.11.

3.7.11.1.2.4. Against – we need to carefully consider this. Not passing this now does not prevent continuing to making progress. Urges the group to not try an move too quickly, but allow for further consideration.

- 3.7.11.1.2.5. This subject has been addressed for a year. There have been presentations in WNG.
    - 3.7.11.1.3. Motion ID 483
    - 3.7.11.1.4. Vote: Motion passes 36 : 9 : 44
  - 3.7.12. **WAVE SG**
    - 3.7.12.1. "Move to replace the previously approved PAR document IEEE 802.11-03/0943r4 with the corrected version (editorial changes only) IEEE 802.11-03/0943r5, for forwarding to ExCom for Approval"
      - 3.7.12.1.1. Moved Lee Armstrong on behalf of WAVE SG
      - 3.7.12.1.2. Discussion
        - 3.7.12.1.2.1. The WG chair has reviewed the document and agrees that the changes are editorial, and the ExCom has been informed that the name has been changed from DSRC to WAVE.
      - 3.7.12.1.3. Motion ID 484
      - 3.7.12.1.4. Vote: Motion passes 57 : 0 : 18
  - 3.7.13. **WPP SG**
    - 3.7.13.1. WPP report in document 04/158r0.
      - 3.7.13.1.1.1. Harry Worstell was interim SG chair, and Charles Wright will continue the SG chair from now on.
      - 3.7.13.1.1.2. The secretary was not a voting member, but that is not required in a study group.
      - 3.7.13.1.1.3. The SG voted on the PAR and authorized teleconferences.
    - 3.7.13.2. Motion: By request of the WPP Study Group, move to have the Working Group authorize teleconference calls starting Friday February 19, 2004 at 11:00AM eastern time, and continue weekly until the end of the Study Group's charter. The call-in information will be sent 30 days prior to the first call by way of the IEEE 802.11 reflector.
      - 3.7.13.2.1. Moved Harry Worstell on behalf of WPP SG
      - 3.7.13.2.2. Approved with unanimous consent
  - 3.7.14. **WG Editors Report**
    - 3.7.14.1. Report in document 04/161
    - 3.7.14.2. No documents have been published or in SA or RevCom.
    - 3.7.14.3. Discussed conversion of drafts from Word to Framemaker. IEEE requires conversion to Framemaker 7.0. The group decided to change the 802.11 P&P to state that drafts will be made available in Adobe PDF format.
    - 3.7.14.4. Motion: Move that the editors re-affirm clause 2.5.2 of 331r7 WG policies and procedures that all drafts and amendments be maintained in Framemaker and made available in Adobe Acrobat.
      - 3.7.14.4.1. Moved Al Petrick on behalf of WG Editors
      - 3.7.14.4.2. Discussion
        - 3.7.14.4.2.1. This makes it difficult for people to make submissions based on the current draft. The reality is that most people have Word, but not Framemaker. Suggest that the change to Framemaker be done when moving to Sponsor Ballot.
        - 3.7.14.4.2.2. Agrees – this is a reasonable position. We do need to complete the conversion before sponsor ballot completes, so we know we are voting on the document that gets sent to IEEE.
        - 3.7.14.4.2.3. There are also issues trying to maintain a complex document in MS Word. It is not stable enough, and sometimes unexplainably changes the document.



Submissions are not supposed to look like drafts. They should instruct the editor to make changes to the draft. We could use PDF files for drafts.

- 3.7.14.4.2.4. The TG editors affirm that Framemaker works better for the editor's process.
- 3.7.14.4.2.5. There are specific differences in character sets used by Word and Framemaker. This can introduce errors in the standards that are not obvious. Text capture from PDF is still subject to errors. We don't want to make it more difficult for volunteers to contribute.
- 3.7.14.4.2.6. Cutting and pasting from Acrobat is not workable. What is cut has all sorts of problems, and results in a lot of work to make it usable.
- 3.7.14.4.2.7. Believes Acrobat should be the standard for draft text.
- 3.7.14.4.2.8. Agrees that Acrobat cut and paste is bad, but the savings of time for the editor makes it worth it.
- 3.7.14.4.2.9. The idea of drafts in one format and submissions in another is the issue. We should use one format for everything. At least make the Framemaker source available.
- 3.7.14.4.2.10. The only way to avoid software compatibility problems is to pick one tool.
- 3.7.14.4.2.11. The problem is that the IEEE requires submissions in Framemaker. It has to be correct. Word has become too unwieldy for our large documents.
- 3.7.14.4.2.12. Against the motion – Supports moving to Framemaker at the time of Sponsor Ballot. That is a good idea. This motion would impose on the process where most of the work occurs.
- 3.7.14.4.2.13. Call the question
  - 3.7.14.4.2.13.1. Darwin E / Garth H
  - 3.7.14.4.2.13.2. The question is called without objection
- 3.7.14.4.3. Vote: The motion passes 15 : 14 : 48

### 3.7.15. ANA Motions

- 3.7.15.1. None

### 3.7.16. 802.18 Radio Regulatory

- 3.7.16.1. Worked on cognitive radio. Will have draft by next plenary
- 3.7.16.2. Approved document on consultation from Brazil on implementing 5GHz.
- 3.7.16.3. Will file as 802.18, and no WG approval is required.

### 3.7.17. 802.19 Coexistence

- 3.7.17.1. No Motions, No Update

## 3.8. New Business

### 3.8.1. TGj

- 3.8.1.1. Motion on the floor from 3.7.3.3. Empower TGj to hold meetings beginning in January 2004 as required to conduct business necessary to progress the re-circulation ballot and sponsor ballot process, including creating and issuing drafts for recirculation and sponsor balloting, conducting teleconferences, and handling other business necessary to progress through the IEEE standards process
- 3.8.1.2. This motion is withdrawn by the mover (Sheung Li)
- 3.8.1.3. New motion as drafted and concurred by CAC members:

- 3.8.1.4. Move to empower TGj to hold teleconferences beginning in February 2004 as required to conduct business necessary to progress the re-circulation ballot process, including creating drafts for recirculation balloting, and handling other business necessary to progress through the IEEE standards progress

- 3.8.1.4.1. Moved Sheung Li

- 3.8.1.4.2. Second Peter E

- 3.8.1.4.3. Discussion

- 3.8.1.4.3.1. Is the intention to issue ballots from teleconferences? No, the WG chair will make the decision

- 3.8.1.4.3.2. requesting a specific ending date. 30 days after the March Plenary.

- 3.8.1.5. Motion as amended: Move to empower TGj to hold teleconferences beginning in February 2004, and ending 30 days after the close of the March 2004 plenary session as required to conduct business necessary to progress the re-circulation ballot process, including creating drafts for recirculation balloting, and handling other business necessary to progress through the IEEE standards progress

- 3.8.1.5.1.1. The mover, seconder, and body all accept the change without objection.

- 3.8.1.5.2. Motion ID 487

- 3.8.1.5.3. Vote: motion passes 62 : 0 : 7

### 3.8.2. WG reports

- 3.8.2.1. IETF – IEEE meeting

- 3.8.2.2. Report in Document 04/166r0

- 3.8.2.3. Discussed of defining the full function of an AP in the 802.11 standards as part of CAPWAP work.

- 3.8.2.4. Discussed Radius protocol extensions

- 3.8.2.5. Discussed EAP network discovery, which may be related to the wireless InterWorking SG that was approved. Client discovery of the proper network to use.

- 3.8.2.6. Discussion

- 3.8.2.7. Was this an announced meeting? This meeting was set up by Paul Nicolich, 802 chair, and specific TG chairs were invited. It was an informal process.

### 3.8.3. Business from the Floor

- 3.8.3.1. Regarding Tiger Teams for process improvements: Can WG members contribute? Yes – talk to Brian Mathews

- 3.8.3.2. Will there be standard templates for procedures? The CAC has been called for an extra meeting in March. This is one of the topics that will be addressed.

- 3.8.3.3. Regarding the September Interim meeting? Was there an official position or conclusion? 802.15 and 802.11 have agreed to go to Berlin. Does 802.18 have a viewpoint? 802.18 will have some members with conflict with WP 8A in Geneva for part of the time. 802.20 said they wanted to go to Sydney. 802.16 has not reported their preference. 802.21 will join us in Berlin.

- 3.8.3.4. The WG chair states that we have created two new study groups. Volunteers or nominees for SG chair should contact Stuart Kerry so the names can be presented to ExCom. The Standing Committee on security will be handled in the CAC by the WG chair.

- 3.8.3.5. If there are problems with documents not appearing check for viruses. Documents that are infected will be deleted

## 3.9. Next Meeting

- 3.9.1. The next meeting will be March 14-19, 2004 in Lake Buena Vista, FL. The agenda will be published in 04/149

**3.10. Closing**

- 3.10.1. The meeting is adjourned at 12:10PM

<b>Last Name</b>	<b>First Name</b>	<b>Middle Initial</b>	<b>Email Address</b>
Aboba	Bernard	D	aboba@internaut.com
Aboul-Magd	Osama	S	osama@nortelnetworks.com
Agarwal	Peyush		peyush.agarwal@st.com
Alexander	Thomas		tom@veriwave.com
Allen	Richard	C	rallen@apple.com
Amann	Keith		kamann@spectralink.com
Andelman	Dov		dova@envara.com
Andrade	Merwyn	B	merv@usa.com
Andrus	David	C	dandrus@apple.com
Aoki	Hidenori		aokihid@nttdocomo.co.jp
Aramaki	Takashi		aramaki.takashi@jp.panasonic.com
Arbaugh	William	null	waa@cs.umd.edu
Armstrong	Lee	R	lra@tiac.net
Arunachalam	Vaidhyanathan		arun.arunachalam@skyworksinc.com
Asai	Yusuke		asai.yusuke@lab.ntt.co.jp
Astrin	Arthur	W.	artastrin@aol.com
Audeh	Malik		malik.audeh@tropos.com
Awtrey	Anthony	L	tony@idealcorp.com
Bachmann	Heinz	G	heinz.bachmann@customrf.net
Bagby	David		david.bagby@ieee.org
Bain	Jay		jbain@hiwaay.net
Baker	Dennis	J	d.baker@mchsi.com
Barber	Simon		simon@instant802.com
Bendersky	Daniel		daniel@go80211.com
Bentzion	Tomer		tomerb@metalinkbb.com
Benveniste	Mathilde		benveniste@ieee.org
Berger	Stephen		stephen.berger@ieee.org
Bernstein	Jeff		jbernstein@2wire.com
Berry	Don		donbe@microsoft.com
Bersani	Florent		florent.bersani@francetelecom.com
Bilstad	Arnold	null	bilstad@cisco.com
Bims	Harry		hbims@airflownetworks.com
Bjerke	Bjorn	A	bbjerke@qualcomm.com
Black	Simon		simon@motix.demon.co.uk
Blue	Scott		blue@e-wi.com
Boer	Jan		janboer@agere.com
Boot	John		johnboot@mot.com
Brasier	William	M	bbrasier@vocera.com
Burbank	Jack	L	jack.burbank@jhuapl.edu
Buttar	Alistair	G	alistair.buttar@motorola.com
Cain	Peter	J	peter_cain@agilent.com
Cam-Winget	Nancy		ncamwing@cisco.com
carlton	alan		alan.carlton@interdigital.com
Carney	Bill		bcarney@ti.com
Cash	Broady	B	bcash@arinc.com

Chang	Hsung-Pin		hpchang@cis.nctu.edu.tw
Chang	Kisoo		kschang@samsung.com
Chaplin	Clint	F	cchaplin@sj.symbol.com
Cheng	Hong		hcheng@psl.com.sg
Chesson	Greg	L	greg@atheros.com
Chindapol	Aik		aik.chindapol@siemens.com
Chinitz	Leigh	M	lchinitz@proxim.com
Cho	Brian		byc@gctsemi.com
Choi	Sunghyun		schoi@snu.ac.kr
Choi	Yang-Seok		yschoi@ieee.org
Choudhary	Manoj		manojc@samsung.com
Christoffersson	Per	E	per.christoffersson@teliasonera.com
Coffey	Sean		coffey@ti.com
Conner	W. Steven		w.steven.conner@intel.com
Cook	Charles	I	charles.i.cook@qwest.com
Cook	Kenneth		kcook@ivhs.com
Cramer	Mary	E	mecramer@agere.com
Dacosta	Francis		fdacosta@meshdynamics.com
Daly	Brian		brian.daly@attws.com
De Vegt	Rolf	J	rolf@airgonetworks.com
Del Prado Pavon	Javier		javier.delprado@philips.com
Doi	Yoshiharu		doi@gf.hm.rd.sanyo.co.jp
Duggins	Simon	J	sjd@ttpcom.com
Durand	Roger	P	rdurand@propagatenet.com
Dycian	Yaron		aron@wavionnetworks.com
Eastlake	Donald	E.	donald.eastlake@motorola.com
Ecclesine	Peter		petere@cisco.com
Edney	Jonathan	P	jon.edney@ntlworld.com
Edwards	Bruce		bedwards@broadcom.com
Edwards	Dean		dean.edwards@strixsystems.com
Ellis	Jason		jsnellis@ieee.org
Emeott	Stephen	P	steve.emeott@motorola.com
Engwer	Darwin		dengwer@nortelnetworks.com
Eriksson	Patrik		patrik.eriksson@acreo.se
Erwin	Jeff		jeffer@microsoft.com
Estrada	Andrew	X	andrew.estrada@am.sony.com
Fakatselis	John	C.	jfakatselis@globespanvirata.com
Falk	Lars	P	lars.p.falk@teliasonera.com
Famolari	David		fam@research.telcordia.com
Faulkner	Michael		mf@sci.vu.edu.au
Feinberg	Paul	H.	paul.feinberg@am.sony.com
Feldman	Alex		afeldman@bermai.com
Filauro	Valerio		valerio.filauro@st.com
Fischer	Matthew	J	mfischer@broadcom.com
Fisher	Wayne	K	wfisher@arinc.com
Flintstone	Frederic		fred2@fred.com

Formoso	Ruben	R	ruben.formoso@motorola.com
Frei	Randy		randy@skypilot.com
Friefeld	Andrew	S	andrew.s.friefeld@intel.com
Gardner	James		jamesgardner@woodsidenet.com
Ghazi	Vafa		vafa@ieee.org
Giesberts	Pieter-Paul		pgiesberts@agere.com
Gilbert	Jeffrey	M	gilbertj@atheros.com
Godfrey	Tim		tgodfrey@globespanvirata.com
Goldstein	Yuri		yuri_goldstein@pctel.com
Goren	Aviv		avivg@metalink.co.il
Goubert	Gerard		gwg@iol.unh.edu
Gray	Gordon	P	paul@airwave.com
Gryder	Roxanne	R	roxanne.r.gryder@intel.com
Guirguis	Sam		sguirguis@commasic.com
Gummadi	Srikanth		sgummadi@ti.com
Guo	Jianlin		guo@merl.com
Guo	Qiang		qa3565@email.mot.com
Gupta	Om	P	ogupta@paratek.com
Gupta	Vivek	G	vivek.g.gupta@intel.com
Haines	Russell	J	russell.haines@toshiba-trel.com
Haisch	Herman	F	hhaisch@proxim.com
Halasz	David	E	dhala@cisco.com
Halford	Steven	D	shalford@globespanvirata.com
Hall	Robert	J	bhall@labs.sbc.com
Hanaoka	Seishi		hanaoka@crl.hitachi.co.jp
Hansen	Christopher	J	hansencj@hotmail.com
Harada	Yasuo		harada.yasuo@jp.panasonic.com
Harkins	Daniel	N	dharkins@trpz.com
Haslestad	Thomas		thomas.haslestad@telenor.com
Hassan	Amer	A	amerh@microsoft.com
Hasty	Vann		vhasty@meshnetworks.com
Hayes	Kevin	N.	kevin@atheros.com
He	Haixiang		haixiang@nortelnetworks.com
Hedberg	David	J	dhedberg@globespanvirata.com
Hermodsson	Frans	M	frans.hermodsson@teliasonera.com
Hetherington	Dave		dave.hetherington@rovingplanet.com
Hiertz	Guido	R.	grh@comnets.rwth-aachen.de
Hinsz	Christopher	S	chinsz@sj.symbol.com
Hochnadel	Ronald	D	ronh@intrass.com
Hoghooghi	Michael	M	emh002@email.mot.com
Holt	Keith		keith.holt@intel.com
Hosur	Srinath		hosur@ti.com
Housley	Russell	D	housley@vigilsec.com
Howley	Frank	P.	frank_howley@yahoo.com
Hoymann	Christian	P	hoy@comnets.rwth-aachen.de
Hsu	Yungping	A	yphsu@ieee.org

Hu	Hao		huhaoby@huawei.com
Ikram	Muhammad	Z	mzi@ti.com
Imamura	Daichi		imamura.daichi@jp.panasonic.com
Imamura	Kimihiko		imamura.kimihiko@sharp.co.jp
Inoue	Yasuhiko		yinoue@ansl.ntt.co.jp
ITO	Takumi		t-ito@dp.jp.nec.com
Jacobsen	Eric	A	eric.a.jacobsen@intel.com
Jeon	Taehyun		thjeon@etri.re.kr
Jeong	Moo Ryong		mrj@ieee.org
Jiang	Daniel		daniel.jiang@daimlerchrysler.com
Jokela	Jari	E	jari.jokela@nokia.com
Jones	Ben		bjones@bandspeed.com
Jones	VK		vkjones@airgonetworks.com
Jose	Bobby		bobby@ieee.org
Jou	Tyan-Shu	null	tsjou@janusysnetworks.com
Kain	Carl	W	ckain@mitretek.org
Kandala	Srinivas		srini@sharplabs.com
Karnik	Pankaj	R	pankaj.karnik@jhupl.edu
Kasch	William		william.kasch@jhupl.edu
Kawabata	Kazuaki		kazuaki.kawabata@toshiba.co.jp
Kelly	Patrick		pkelly@bandspeed.com
Kerry	Stuart	J	stuart@ok-brit.com
Ketchum	John	W.	johnk@qualcomm.com
Keys	Phillip		keys@nikkeibp.co.jp
Kezys	Vytas	R	vkezys@rim.net
Khayyat	Khalid		khayyat@uvic.ca
Kido	Ryoji		kido.ryoji@jp.panasonic.com
Kikuma	Tomohiro		t-kikuma@ay.jp.nec.com
Kim	Yongbum		ybkim@broadcom.com
Kim	Yongbum		ybkim@broadcom.com
Kim	Yongsuk		yongsuk@samsung.com
King	Wayne	G	wking@microsoft.com
Kinney	Patrick		pat.kinney@ieee.org
Klein	John	R	jklein@sj.symbol.com
Kleindl	Guenter		guenter.kleindl@siemens.com
Koga	Keiichiro		k-koga@da.jp.nec.com
Kossin	Philip	S	pkossin@intrinsix.com
Kowalski	John	M	kowalskj@sharplabs.com
Kraemer	Bruce	P	bkraemer@globespanvirata.com
Kuehnel	Thomas		tkuehnel@microsoft.com
Kumagai	Tomoaki		kumagai@ansl.ntt.co.jp
Kunihiro	Takushi		kuni@wcs.sony.co.jp
Kuo	Ted		ted@janusysnetworks.com
Kurihara	Thomas	M	tkstds@mindspring.com
Kuwahara	Denis		denis.kuwahara@boeing.com
Kwak	Joe		joekwak@mindspring.com

Laihonen	Kari	A	kari.laihonen@teliasonera.com
Lambert	Paul		paul@airgonetworks.com
Landeta	David	S	dlandeta@globespanvirata.com
Lanzl	Colin		clanzl@ieee.org
Le	Vinh	T	vle@sj.symbol.com
Lee	Taejin		ltj@waveincom.com
Levy	Joseph		joseph.levy@interdigital.com
Li	Pen		pen.li@philips.com
Liang	Jie		jliang@ieee.org
Lim	Yong Je		yongje.lim@samsung.com
Lin	Huashih	A	halin@winbond.com
Lin	Victor		vlin@extremenetworks.com
Lissack	Zeev		zeevl@envara.com
Liu	Changwen		changwen.liu@intel.com
Mahadevappa	Ravishankar	H	ravi@realtek-us.com
Malik	Rahul		rahul@psl.com.sg
Mani	Mahalingam		mmani@avaya.com
mankin	kevin	m	kmm111313@hotmail.com
Martell	Jonn	G	jonn.martell@ubc.ca
Martin	Art		art.martin@intel.com
Maruhashi	Kenichi		k-maruhashi@bl.jp.nec.com
MARUYAMA	NAOTAKA		naotaka_maruyama@netcleus.co.jp
Mathews	Brian		brian@linux-wlan.com
Matsumoto	Yoichi		matsumotoyou@nttdocomo.co.jp
Maufer	Thomas	A	tmaufer@nvidia.com
McCann	Stephen		stephen.mccann@roke.co.uk
McIntosh	Bill	J	bmcintosh@fortresstech.com
McNamara	Darren	P	darren.mcnamara@toshiba-trel.com
McNew	Justin	P	jmcnew@technocom-wireless.com
Medvedev	Irina		iriram@qualcomm.com
Meyer	Klaus		klaus.meyer@amd.com
Miki	Morgan	H	miki@slab.tnr.sharp.co.jp
Miller	Robert	R.	rrm@att.com
Mishra	Partho		parthomishra@airgonetworks.com
Miyoshi	Kenichi		miyoshi.kenichi@jp.panasonic.com
Molnar	Peter	R	pmolnar@rfmd.com
Monteban	Leo		monteban@agere.com
Montemurro	Michael		mike@chantrynetworks.com
Moon	Jae		moon@ece.umn.edu
Moreton	Mike		mike.moreton@synad.com
Morley	Steven	A.	smorley@qualcomm.com
Moskowitz	Robert	G	rgm@icsalabs.com
Mueller	Joseph		mueller@ti.com
Mujtaba	Syed	Aon	mujtaba@agere.com
Mukai	Manabu		mukai@csl.rdc.toshiba.co.jp
Mulder	Willem		wmulder@agere.com



Murakami	Yutaka		murakami.ytk@jp.panasonic.com
Myers	Andrew	D	andrew.myers@bt.com
Myles	Andrew		andrew.myles@cisco.com
Nagai	Yukimasa		yuki-n@isl.melco.co.jp
Naka	Katsuyoshi		naka.katsuyoshi@jp.panasonic.com
Nakamura	Michiharu		michi@flab.fujitsu.co.jp
Nakao	Seigo		snakao@gf.hm.rd.sanyo.co.jp
Nakase	Hiroyuki		nakase@riec.tohoku.ac.jp
Nanda	Sanjiv		snanda@qualcomm.com
Narasimhan	Ravi		ravin@marvell.com
Nelson	David	B.	dnelson@enterasys.com
Newton	Paul	D	paul.newton@synad.com
Ngo	Chiu		chiu.ngo@samsung.com
Nguyen	Loi	D	lnguyen@inphi-corp.com
Nguyen	Tuan	P	paul_nguyen@att.net
Nitsche	Gunnar		gunnar.nitsche@philips.com
Noda	Masaki		m-noda@msrd.hitachi.co.jp
Noh	kyoung-ju		kjnoh@etri.re.kr
Oakes	Ivan	F	ivan.oakes@synad.com
Oguma	Hiroshi		oguma@mit.pref.miyagi.jp
Oh	Jongtaek		jtoh@hansung.ac.kr
Oh	Kyunghee		khoh@etri.re.kr
O'Hara	Bob		bob@airespace.com
O'Hara	Sean	T	ohara@syrres.com
Ohtani	Yoshihiro		ohtani@slab.tnr.sharp.co.jp
Olson	Timothy	S	tolson@cisco.com
Ono	Hiroshi		h_ono@zuken.co.jp
Oomen	Peter		poomen@ivhs.com
Ophir	Lior		lior.ophir@ti.com
Oyama	Satoshi		oyama@tsji.hitachi.co.jp
Paine	Richard	H	richard.h.paine@boeing.com
Paljug	Michael	J	mpaljug@globespanvirata.com
Park	Joon Goo		t9park@samsung.com
Parker	Steve		steve.parker@toshiba-trel.com
Patel	Vijay		qvp003@email.sps.mot.com
Peleg	Yaron		yaron.peleg@go80211.com
Perahia	Eldad		eperahia@cisco.com
Petre	Frederik	G	frederik.petre@imec.be
Petrick	Al		apetrick@icefyre.com
Pitarresi	Joe		joe.pitarresi@intel.com
Pope	Stephen	P	spp@ti.com
Portaro	James	D	jimp@neteam.net
Potter	Al		apotter@icsalabs.com
Ptasinski	Henry		henryp@broadcom.com
Puri	Anuj		anuj@eecs.berkeley.edu
Purkovic	Aleksandar		apurkovi@nortelnetworks.com

Qi	Emily	H	emily.h.qi@intel.com
Qu	Bingyu		qubingyu@huawei.com
Quinn	Liam	B.	liam_quinn@dell.com
Raab	Jim	E	jraab@austin.rr.com
Rangwala	Noman		noman.rangwala@analog.com
Rayment	Stephen	G	srayment@belairnetworks.com
Riegel	Maximilian		maximilian.riegel@siemens.com
Ring	Edmund	J	ejring1@mmm.com
Roberts	Mark		mroberts@icefyre.com
Rommer	Stefan		stefan.rommer@ericsson.com
Rosdahl	Jon	W	jrosdahl@ieee.org
Sabaz	Dorian		dorian@iroboticscorp.com
Sadowsky	John	S	john.sadowsky@intel.com
Sakurai	Shoji		saku@isl.melco.co.jp
Sampath	Hemanth		hemanth1@stanfordalumni.org
Sanwalka	Anil		anil@neesus.com
Sastry	Ambatipudi	R	asastry@packethop.com
scalise	fabio		fabio.scalise@st.com
Schaffnit	Tom		tom@schaffnit.com
Schreder	Brian		bschreder@agere.com
Seals	Michael		mseals@globespanvirata.com
Sennett	DeWayne		dewayne.sennett@attws.com
Seo	Jeong-Hwan		jh2931.seo@samsung.com
Shankar	Hari		hshankar@inphi-corp.com
Shellhammer	Stephen	J	shellhammer@ieee.org
Shelton	Tamara	S	tamara@athenecon.com
Sherlock	Ian		isherlock@ti.com
Sheu	Ming		msheu@janusysnetworks.com
Shimada	Shusaku		shusaku@ieee.org
Shoemake	Matthew	B	m.b.shoemake@ieee.org
Shvodian	William	M	bshvodian@xtremespectrum.com
Shyy	D. J.		djshyy@mitre.org
Simoens	Sebastien		simoens@motorola.com
Simpson	Floyd		floyd.simpson@motorola.com
Singh	Manoneet		msingh@ti.com
Sinivaara	Hasse	K	hasse.sinivaara@nokia.com
Skafidas	Efstratios (Stan)		e.skafidas@bandspeed.com
Skidmore	Roger	R	roger@wirelessvalley.com
Soomro	Amjad		amjad_soomro@hotmail.com
Soranno	Robert	T	robert.soranno@jhuapl.edu
Spurgeon	William	L	bspurgeon@sirit.com
Stanley	Dorothy		dstanley@agere.com
Staszak	Martin	J	marty@staszakcom.com
Stephens	Adrian	P	adrian.p.stephens@intel.com
Stevens	William	M	bill@radioframenetworks.com
Stevenson	Carl	R.	carl.stevenson@ieee.org

Stivers	Fred	S	fstiver@ti.com
Sun	Qinfang		qfsun@atheros.com
Sung	SK		s.sung@samsung.com
Surineni	Shravan	K	shravans@iol.unh.edu
Tai	Charlie		charlie.tai@intel.com
Takahashi	Seiichiro		stakahashi@stec.sanyo.com
Takaoka	Katsumi		takaoka-katsumi@jvc-victor.jp
Takeda	Daisuke		daisuke.takeda@toshiba.co.jp
Tan	Teik-Kheong	null	ttan@ieee.org
Tang	Wai-Cheung		wctang@ivhs.com
Taylor	James	L	larry.taylor@acm.org
Tee	Lai-King Anna		laikingt@ieee.org
ten Brink	Stephan		tenbrink@ieee.org
Terry	John	D	john.terry@nokia.com
Thornton	Timothy	J	tthornton@calamp.com
Thrasher	Jerry		thrasher@lexmark.com
Todd	Terry		todd@mcmaster.ca
Tokuyama	Katsumi		tokuyama@keystream.co.jp
Tomcik	James	D.	jtomcik@qualcomm.com
Tsao	Jean		jeantsao@hotmail.com
Tsien	Chih	C	chih.c.tsien@intel.com
Tsoulogiannis	Tom		tomt@neesus.com
Tung	David		dtung@ralinktech.com
Tzannes	Marcos		marcos@aware.com
Uchida	Yusuke		yusuke.uchida@hal.hitachi.com
van Leeuwen	Richard		rleeuwen@agere.com
Van Nee	Richard	D.J.	vannee@airgonetworks.com
van Waes	Nico	J	nico.vanwaes@nokia.com
van Zelst	Allert		avanzelst@ieee.org
Vlantis	George	A	george.vlantis@st.com
Walker	Jesse	R	jesse.walker@intel.com
Wallace	Brad	A	bwallace@vixs.com
Walrant	Thierry		thierry.walrant@philips.com
Walter	John	R	john.walter@intermec.com
Wandile	Vivek		vivek.wandile@wipro.com
Wang	Huaiyuan		fsw023@motorola.com
Wang	Stanley		swang@csusm.edu
Watanabe	Fujio		fwatanabe@ieee.org
Webster	Mark	A	mwebster@globespanvirata.com
Wells	Bryan		bryan_wells@denso-diam.com
Weytjens	Filip		filip.weytjens@transcore.com
Whitesell	Stephen	R	swhitesell@vtech.ca
Williams	Michael Glenn		michael.g.williams@nokia.com
Williams	Richard		richard@ti.com
Wilson	James	M	james.mike.wilson@intel.com
Winters	Jack	H	jwinters@motia.com

Wolf	Andreas	C.	aw@dw-a.com
Wong	Jin Kue		jkwong@nortelnetworks.com
Wong	Timothy	G	twong@ubicom.com
Worstell	Harry	R	hworstell@research.att.com
Wright	Charles	R	charles_wright@azimuth.net
Wu	Geng		gengwu@nortelnetworks.com
Wu	Kim		kimwu@inprocomm.com.tw
Yamaguchi	Hirohisa		h-yamaguchi4@ti.com
Yamaura	Tomoya		yamauratomoya@yahoo.co.jp
Yano	Takashi		yano@crl.hitachi.co.jp
Yaqub	Raziq		ryaqub@tari.toshiba.com
Yee	Jung		jyee@icefyre.com
Yin	Hujun		hujuny@ieee.org
Yin	Jijun		jijun@hrl.com
Yong	Kit	C	kyong@houston.rr.com
Young	Chris		cyoung@broadcom.com
Yu	Heejung		heejung@etri.re.kr
Yu	Patrick	W	patrick_yu@ieee.org
Yung	Hon	M	raymond.yung@conexant.com
Zhong	Zhun		zhun.zhong@philips.com
Zhu	Jeffrey	C.	jzhu@ivhs.com
Zorn	Glen		gwz@cisco.com
Zorn	Glen		gwz@groovy.com
Zyren	James		jzyren@globespanvirata.com

IEEE P802.11  
Wireless LANs

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Minutes of 802.11 Task Group E  
MAC Enhancements - QoS

Vancouver, British Columbia

**Date:** January 12-16, 2004

**Author:** David Hunter  
Vetronix / Bosch  
Phone: 805 966 2000 x3145  
e-Mail: hunter@timefactor.com

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## 1. 10:30 am Monday, January 12, 2004

### 1.1. Opening

#### 1.1.1. *Call to order*

1.1.1.1. John Fakatselis (JohnF) called the meeting to order at 10:38am.

### 1.2. Agenda

#### 1.2.1. *Review of the agenda (JohnF)*

1.2.1.1. Tentative meeting agenda: 11-03-965r0-W-802.11-WG-Tentative-Agenda-January-2004.xls

1.2.1.2. JohnF reviewed the proposed agenda.

1.2.1.2.1. There will be an LMSC Executive Committee meeting today at 6pm. We will be making a request about Procedure 10 at that meeting. But we won't be able to get results from that meeting until this evening. So some items in the current agenda may have to be changed per the outcome of that meeting.

1.2.1.2.2. Review minutes from previous meeting.

1.2.1.2.3. Call for papers.

1.2.1.2.4. The Fixed Time agenda Items are listed on the agenda.

#### 1.2.2. *Approval of the agenda*

1.2.2.1. JohnF: Are there any comments on the agenda?

1.2.2.2. Mathilde Benveniste (MathildeB): With respect to the Procedure 10 outcome: we can still spend today doing editorial changes?

1.2.2.3. Floyd Simpson (FloydS): Will there be a summary of Procedure 10 and its outcome?

1.2.2.4. JohnF: Yes, that is in item 6 of the agenda.

1.2.2.5. JohnF: I ask the voting members, are there any objections to approving this new version of the agenda?

1.2.2.6. JohnF: I see no objections, so the agenda is approved.

### 1.3. Comment Resolution Discussion

#### 1.3.1. *Recirculation vs. Sending this to Sponsor Ballot*

- 1.3.1.1. JohnF: How many new members are here?
- 1.3.1.2. {Secretary saw only one.}
- 1.3.1.3. JohnF reviewed the procedures of allowing new members to participate, but going to a voting member to make all motions.

### 1.4. Reviews of voting rules and process

#### 1.4.1. *Process*

- 1.4.1.1. JohnF reviewed the general task group voting procedures and willingness for open participation, but noted that motions must be made and voted by voting members.
- 1.4.1.2. JohnF: Technically only voting members can participate in discussion, but I will make an exception to allow all present to discuss. If you [are not a voting member and] want to make a motion, make sure you ask a member to make the motion. At times we will allow non-voting members to vote on some of the issues. Any other questions on voting and policies and rules?

#### 1.4.2. *Minutes of the November 2003 Interim Meeting*

- 1.4.2.1. JohnF: Are there any questions or issues with the minutes of the November 2003 meeting in Albuquerque?
- 1.4.2.2. JohnF: I hear none. The minutes of November 2003 are approved with unanimous consent.

### 1.5. Discussion of Recirculation Ballot

- 1.5.1.1. JohnF: Looking at the LB results for LB 59, 59,63 (document 802.11e-LB51-59-63-Results001204.xls on the screen), we can see that there are gradual changes. In the last vote there was a net gain of 4 Yes votes.
- 1.5.1.2. Srinik: Matthew Sherman indicated he is changing his NO vote to Yes.
- 1.5.1.3. JohnF: I see that we have not changed that yet. So this changes the remaining votes to 248 Yes; 30 No.
- 1.5.1.4. Srinik: So that is now 80.2% Yes votes.
- 1.5.1.5. JohnF: So now we have the motion from the last meeting: Request approval of a Sponsor Ballot for draft 802.11e 6.0 by ExCom using LMSC Procedure 10 assuming that the conditions required for Procedure 10 are met. This passed 20-0-4.
- 1.5.1.6. JohnF: If Procedure 10 is ruled this evening to be appropriate, then we will be taking most of the rest of the week off.
- 1.5.1.7. Stephen Wang (StephenW): With respect to the interaction of TGe and TGi, will there be a coordination this week?
- 1.5.1.8. JohnF: No dependency of TGe with TGi has been brought up to me. I have no requests from them to hold a coordination meeting.
- 1.5.1.9. Srinik: I do not believe you can take any action until TGi is done.
- 1.5.1.10. Ivan Reitman (IvanR): So there may be two spontaneous ballots?
- 1.5.1.11. JohnF: That is likely. Then we may have to have later work coordinating them.
- 1.5.1.12. Srinik: On Thursday morning at 8am there is a joint session with TGi scheduled.
- 1.5.1.13. JohnF: Any more questions? Seeing none, I would like to pass this to Srinik to summarize the overall comments, progress from LB to LB, and technical aspects of the responses.

## 1.6. LB 63 Review, Srini Kandala

- 1.6.1.1. SriniK: Document 11-03-0988-01-0003-TGe-draft-ballot-information.ppt describes the results. There were 243 technical comments, of which 140 were part of a “No” vote, and 140 were carried over from earlier ballots. Many of these appear to be fairly “stale”, redoing old issues that have been discussed many times before. See document 11-04-1001-00-000e-letter-ballot-63-comments.xls for a summary of the individuals and the numbers of outstanding comments. Document 11-03-0989-01-000e-TGe-outstanding-no-comments.xls includes all of the outstanding comments. I believe that the majority of these are editorial, some are bug fixes and the remaining largely are resubmitted comments. Any questions?

## 1.7. Comment Review Process

### 1.7.1. Review of Technical Comments from new “No” voters

- 1.7.1.1. JohnF: I'd like to organize ourselves for the two possible outcomes with respect to Procedure 10. I'd like to ask Srini to review what is required for Procedure 10.
- 1.7.1.2. SriniK read and reviewed 802 LMSC Policies and Procedures, Procedure 10.
- 1.7.1.3. David Hunter (DavidH): Does this mean that you are going to have to present every one of the outstanding technical comments this evening at the ExCom?
- 1.7.1.4. SriniK: I believe that I can present a summary.
- 1.7.1.5. SriniK: There are two new “No” voters.
- 1.7.1.6. JohnF: Can we go over their comments now to see if they are valid?
- 1.7.1.7. SriniK: Sunghyun Choi is a new “No” vote: Comments 284-288.
- 1.7.1.8. SriniK: I believe 284 should be declined.
- 1.7.1.9. Amjad Soomro (AmjadS): But is it valid? That is, is it about some text that was changed per a previous comment?
- 1.7.1.10. JohnF: This really is asking for more text, so it could be editorial.
- 1.7.1.11. SriniK: Comment 285, 9.9.2.1.3. The lines are new, but the commentator is mistaken about this preventing what he wants.
- 1.7.1.12. JohnF: It is a valid comment, since it is about changed lines and he explains why he is against these.
- 1.7.1.13. SriniK: Comment 286. Again, the comment is valid, but is mistaken.
- 1.7.1.14. JohnF: This is not a valid comment, since it about a redesign of the whole mechanism.
- 1.7.1.15. SriniK: Comment 287. I believe the comment is correct.
- 1.7.1.16. Greg Chesson (GregC): Is this referring to a poll message?
- 1.7.1.17. SriniK: Yes. This is about what the HC does.
- 1.7.1.18. GregC: This is not that big a problem; it doesn't have that bad consequences. Just saying they don't know how to set it. It's really the DurationID field that should be whatever the HC rules are for sending one frame. You can also say that when TXOP is 0 there shall be no hidden nodes.
- 1.7.1.19. SriniK: Comment 288. This is about a conflict with Footnote 15.
- 1.7.1.20. JohnF: This really is about a change on the last draft?
- 1.7.1.21. SriniK: I believe so. This is not really a conflict, but a narrow case. I believe some correction is needed.
- 1.7.1.22. SriniK: Comment 289 is on HCCA for TC. I believe this is not valid, because this sentence was here before, only moved from another paragraph. This is not a change from Draft 5.0.
- 1.7.1.23. JohnF: Please check the other comments and make sure they are based on something that was changed from the previous draft.

- 1.7.1.24. SрниK: The other new “No” voter is Javier del Prado. Comment 120. I believe the current text is correct, and there is no change from the previous draft.
- 1.7.1.25. JohnF: Is Javier here? Can someone find him to comment directly on these?
- 1.7.1.26. SрниK: Comment 125. Probably this comment is valid; we just have to explain.
- 1.7.1.27. SрниK: Comment 127 is to define ERP, which is defined in 11g. This is valid.
- 1.7.1.28. SрниK: Comment 128 on 7.3.1.9. The comment is valid, though I don’t believe anything else needs to be changed and it should be declined.
- 1.7.1.29. SрниK: Comment 129 is valid, but appears to be more editorial.
- 1.7.1.30. SрниK: Comment 131 on a Acceptable Frame Loss Rate parameter. I believe this is a carryover comment from Amjad.
- 1.7.1.31. Menzo Wentink (MenzoW): This is not based on a change in the text.
- 1.7.1.32. SрниK: Comment 134.
- 1.7.1.33. GregC: That’s a valid comment; the resolution should be to change the name of one of those fields, which could be taken as an editorial change.
- 1.7.1.34. SрниK: Comment 136. This is about an editorial mistake I made; I believe it does not entail a technical change from what we have decided earlier.
- 1.7.1.35. SрниK: Comment 137 is valid; it is about a new change we made.
- 1.7.1.36. SрниK: Comment 141 is about a clarification, which could be editorial.
- 1.7.1.37. SрниK: Comment 142. I believe this is valid, and there is some inconsistency.
- 1.7.1.38. SрниK: Comment 143. Is this new?
- 1.7.1.39. John Kowalski (JohnK): This is new.
- 1.7.1.40. GregC: You could just put in 0 if you don’t want to use this. So you could accept the comment and do nothing.
- 1.7.1.41. SрниK: This is just about moved text anyway.
- 1.7.1.42. JohnK: This text was definitely there before the last recirc ballot.
- 1.7.1.43. SрниK: Comment 144. I believe this is valid, but wrong.
- 1.7.1.44. SрниK: Comment 146. I believe that this is valid and part of a new change.

### 1.7.2. “No” Voter Contacts

- 1.7.2.1. JohnF: It seems that both reversals have some valid comments, so that will require an exception to Procedure 10 that the ExCom will be asked to approve. I would also like a member of the Sponsor Ballot committee to be at the meeting.
- 1.7.2.2. JohnK: I would assume that that would not commit us to attending the whole LMSC meeting.
- 1.7.2.3. JohnF: How many Sponsor Ballot members are here? I see several. Who can contact Sunghyun?
- 1.7.2.4. JohnK: I can.
- 1.7.2.5. JohnF: Amjad, an you contact Javier?
- 1.7.2.6. AmjadS: He most likely is in TGn.
- 1.7.2.7. JohnF: Can you see if you can find him now?
- 1.7.2.8. AmjadS: Will do.
- 1.7.2.9. JohnF: And Sрни can you email Sunghyun?
- 1.7.2.10. SрниK: Yes.
- 1.7.2.11. JohnF: And we will call his office as well.
- 1.7.2.12. GregC: Since Amjad hasn’t come back for a while, how about breaking for lunch?
- 1.7.2.13. JohnF: Good, let’s recess until this afternoon’s session.



## 1.8. Closing

### 1.8.1. Recess for Ad-Hoc Group Work

- 1.8.1.1. JohnF recessed the TG 12:10pm.

## 2. 1:30 pm Monday, January 12, 2004

### 2.1. Opening

#### 2.1.1. Call to order

- 2.1.1.1. JohnF called the meeting to order at 1:40pm.

### 2.2. Procedure 10 Checklist

#### 2.2.1. Review of Checklist

- 2.2.1.1. JohnF: I'd like Srimi to review the Procedure 10 checklist, so that we all know what is needed.
- 2.2.1.2. MathildeB: Are we going to cover the new comments by previous "No" voters?
- 2.2.1.3. JohnF: At this point I'm not sure they are relevant to Procedure 10.
- 2.2.1.4. MathildeB: From what Srimi read earlier, I'm not sure, but there may be some new comments that might cause people to change their minds.
- 2.2.1.5. JohnF: That may be right. Lets go over those comments in the meantime, after Srimi's review.
- 2.2.1.6. SrimiK: Here is Procedure 10 again. We need to cover the ballot information, as in 03/0988r1. A question to the chair, is the second recirculation a confirmation ballot?
- 2.2.1.7. JohnF: That is a confirmation.
- 2.2.1.8. SrimiK: Then I'll change that description in this summary. Do we need a specific schedule for these ballots?
- 2.2.1.9. JohnF: The schedule for this week should be sufficient for that.
- 2.2.1.10. SrimiK: Then I'll add "Schedule for the resolution of comments: Jan 12-16, 2004". And the final issue is the coverage of the comments that are associated with the remaining disapprove votes. This is the list in 11-03-0989-01, which is the list we were going over this morning. So I believe 03/989r1 would constitute the package that will fulfill this requirement.
- 2.2.1.11. JohnF: Any comments? Hearing none, are there any objections?
- 2.2.1.12. Matthew Fischer (MatthewF): What was the objection last time?
- 2.2.1.13. JohnF: As I understand, the problem was that the group had not had time to see the package as a whole.
- 2.2.1.14. Amjad: Javier reports that he can attend the second afternoon session.
- 2.2.1.15. Floyd Simpson (FloydS): I believe that the draft is not ready for Sponsor Ballot.
- 2.2.1.16. JohnF: The vote in the last meeting was that we pass Draft 6.0 on to Sponsor Ballot. So you disagree with that vote?
- 2.2.1.17. FloydS: I believe that there are enough No votes on LB63, that I believe that this draft is not ready for Sponsor Ballot.
- 2.2.1.18. MathildeB: I would like to second Floyd's comment.
- 2.2.1.19. JohnF: So noted. Is Srimi ready to review all of the comments from "No" voters?

**2.2.2. Review of Technical Comments from “No” voters**

- 2.2.2.1. JohnF: Just go through the comments. If someone wants to point out something, they can make a comment here.
- 2.2.2.2. SriniK started the review, in numerical order, of each of the comments (except for the comments covered in the morning session) listed in document 11-04-1001-00-000e-letter-ballot-63-comments.xls.
- 2.2.2.3. SriniK: I believe that at least the comments 2, 5, 11 and many more are editorial or procedural and can be solved without technical changes.
- 2.2.2.4. MathildeB: What feedback do you want from all of this?
- 2.2.2.5. JohnF: None are necessary.
- 2.2.2.6. MathildeB: How about doing the editorial comments?
- 2.2.2.7. JohnF: We can do those now.
- 2.2.2.8. DavidH: Some of these technical comments appear to be editorial. Can we decide on those now?
- 2.2.2.9. JohnF: Absolutely, we can decide whether they are and can be resolved that way.
- 2.2.2.10. MathildeB: The technical comments are very instructive and I think should be included before we go to Sponsor Ballot.
- 2.2.2.11. JohnF: We will present the unresolved comments to the ExCom when we make the presentation.
- 2.2.2.12. MathildeB: Is it legal for us to propose solutions to the technical comments that are still outstanding?
- 2.2.2.13. JohnF: We can do that, though it likely will take a lot longer than we have until the 6pm ExCom meeting.
- 2.2.2.14. MathildeB: Then how about at least talking about the editorial changes now?
- 2.2.2.15. JohnF: Sure. Is there any objection to doing that now? Seeing none, that is what we'll do. Srini, can you present the editorial comments now?
- 2.2.2.16. DavidH: Can we start with the technical comments that Srini thinks are editorial?
- 2.2.2.17. JohnF: No, because someone could raise further issues with that.
- 2.2.2.18. MathildeB: While Srini is separating out the editorial comments, can I present a short paper?
- 2.2.2.19. JohnF: Sure.

**2.3. Papers****2.3.1. Document 4/0062r0, Clarifications on APSD, Mathilde Benveniste**

- 2.3.1.1. MathildeB: This is the result a review of the draft and some apparent contradictions with what we have decided to do later.
- 2.3.1.2. FloydS: What comments does this apply to?
- 2.3.1.3. MathildeB: I have not had access to the LB63 comments until now, so I can't say the exact numbers right now. But several comments are related to this. This is just a presentation; there will be no motions.

**2.3.2. Vote on having a presentation**

- 2.3.2.1. FloydS: I thought we were going to cover the editorial comments now.
- 2.3.2.2. JohnF: I will make the note that normally editorial comments are not covered here at all, but are just up to the editor. I will ask the group, is there any objection to making this presentation now? I see one, so we can have a vote.
- 2.3.2.3. MathildeB: I am just trying to clean up some apparently inconsistent editorial details.
- 2.3.2.4. FloydS: My issue with this is that we are circumventing an agreement that we just had. I can make a presentation that I claim is editorial without it applying to any particular editorial comment.

- 2.3.2.5. JohnF: Vote: everyone in favor of Mathilde continuing with this presentation?  
The motion passes with 5:1:17. So we will have this presentation.

**2.3.3. Document 04/0062, continued**

- 2.3.3.1. MathildeB: The first change is just for my own clarification.
- 2.3.3.2. Mark Bilstad (MarkB): I understand what you're getting at here. I put in a couple of comments that the related phrases should have some name that clarifies the text. I just didn't invent the name.
- 2.3.3.3. GregC: APSD is CPR-like.
- 2.3.3.4. MathildeB: APSD refers to both scheduled and unscheduled tasks.
- 2.3.3.5. GregC: Say I set up a schedule mode transfer.
- 2.3.3.6. MathildeB: To review: we have two modes (power save and awake) and two states.
- 2.3.3.7. GregC: Once the STA has set up the schedule, the AP doesn't need to know whether or not the STA is sleeping between scheduled awake periods.
- 2.3.3.8. MathildeB: But the STA can declare itself to be active between those.
- 2.3.3.9. GregC: I understand that that I can still set my PM to 0 and still receive my other traffic by schedule mode. There is a huge chance of losing messages when you change modes. There is nothing in standard about what you do with queue management when the STA is changing its modes. I believe this is a bug, but no one else seems to care, so I won't take up more of your time on it.
- 2.3.3.10. MenzoW: Do you agree with this editorial change?
- 2.3.3.11. GregC: This change is OK. I was just bringing up another bug.
- 2.3.3.12. MathildeB: Another change is in 11.2.1.5.
- 2.3.3.13. MarkB: Just to repeat: we really need specific names for these states.
- 2.3.3.14. MathildeB: We decided last time just "active" and "PS" versus "scheduled" and "unscheduled".
- 2.3.3.15. MarkB: We need to have something that shortens whether we have APSD or not.
- 2.3.3.16. MathildeB: I agree; we should try to invent a name.
- 2.3.3.17. MathildeB: Third change: 7.1.3.5.2. Any concerns about this? I don't see any.  
Next change: the APSD subfield reference in 7.2.3.1.5 is incorrect.
- 2.3.3.18. StephenW: Just to let you know, we have a technical comment on this subject.
- 2.3.3.19. MathildeB: This is just something the Editor did not catch when he was cleaning up the text. Does anyone think the text should be left as is?
- 2.3.3.20. GregC: No, you're absolutely correct, this should be changed.
- 2.3.3.21. MathildeB: Next is a sentence in 11.2.1.4 that should be deleted. Anyone object to the deletion of that?
- 2.3.3.22. Steve Emeott (SteveE): Why isn't that a technical change?
- 2.3.3.23. MathildeB: Is there anyone who has thought this is what we intended to require? Did anyone think that the requirement is to use this for all streams if we use it for one? Does anyone want that?
- 2.3.3.24. MarkB: You could read that sentence several ways.
- 2.3.3.25. MathildeB: I believe we only discussed aggregation with respect to this.  
Therefore, this function serves no useful function, but is misleading now.
- 2.3.3.26. MatthewF: What about the information about aggregation?
- 2.3.3.27. MathildeB: I believe we have enough other information about aggregation. Does anyone want to keep this sentence in the draft? I don't see anyone.
- 2.3.3.28. MathildeB: Next about section 11.2.1.5 versus 11.2.1.4: [the wording] should be "at least one" instead of "all" frames destined for that station. That would bias the performance to be preferential toward APSD stations. Anybody objecting to this change?
- 2.3.3.29. SteveE: Comment. This applies to scheduled STAs as well.

- 2.3.3.30. MathildeB: Absolutely agree with you about that. The draft right now has nothing about when a scheduled period would end.
- 2.3.3.31. MarkB: I believe this is not solving what you want it to solve.
- 2.3.3.32. MathildeB: This sentence does not force the AP to send all the buffered traffic in this case. By changing this, we're leaving it up to the AP to empty out the buffer when it wants to.
- 2.3.3.33. StephenW: What if the frame is a lower priority, then you're forcing the STA to send a lower priority over a higher priority.
- 2.3.3.34. MathildeB: At this point, no one has restricted the scheduled traffic to voice. So you want to restrict it to "at least the same priority"? At least this is better than what you had before. You have to send at least one frame to a STA to tell it to go to sleep, so it might as well be a data frame.
- 2.3.3.35. StephenW: That seems like a technical comment that we would need to vote on.
- 2.3.3.36. MathildeB: I'll put it up to the group. Should we make this consistent now, or should this be a later technical comment? I agree with you about not going to sponsor ballot. So, Mr. Chairman, how should we proceed?
- 2.3.3.37. JohnF: It should be up to the editor what he regards as editorial.
- 2.3.3.38. MarkB: I believe [that] with a lot of these changes, but believe it is a stretch to call some of them editorial.
- 2.3.3.39. JohnF: That will first be up to the editor.
- 2.3.3.40. MathildeB: Fine.
- 2.3.3.41. JohnF: Is there any more information that anyone wants to present?
- 2.3.3.42. MathildeB: There is a comment that I made which requests an informative annex being added. I have the annex ready and will be posting it. I would appreciate it if you could review that for its language.

#### **2.3.4. "No" vote status.**

- 2.3.4.1. JohnF: Sunghyun has just stated that he has no objection to changing to a "Yes" vote while maintaining his comments. My thanks to Sunghyun for that.
- 2.3.4.2. Sunghyun Choi (SunghyunC): My pleasure.
- 2.3.4.3. JohnF: Javier is still considering his vote. He would like to have some consultation with the editor or have some discussion in the whole group. We'll do that at 4pm.

## **2.4. Closing**

### **2.4.1. Recess for Ad-Hoc Group Work**

- 2.4.1.1. JohnF recessed the TG at 3:21pm.

# **3. 4:00 pm Monday, January 12, 2004**

## **3.1. Opening**

### **3.1.1. Call to order**

- 3.1.1.1. JohnF called the meeting to order at 4:00 pm.

### **3.1.2. Recess for ad-hoc work**

- 3.1.2.1. JohnF: I would like Javier and Srini to go over all of the discussion we have had of his comments and then Javier to decide whether to change his vote or bring some of the issues up here. So we will recess briefly for these discussions.

### 3.2. Re-opening

- 3.2.1.1. JohnF called the meeting to order again at 5:05 pm.
- 3.2.1.2. JohnF: Javier has decided not to change his "No" vote, so Srin and I will include that information in our presentation to the ExCom at 6:00 pm.
- 3.2.1.3. MathildeB: If the ExCom decision is not to go to Sponsor Ballot, then will we go into working on comment resolution?
- 3.2.1.4. JohnF: Yes, if that's the case we will begin comment resolution then. We will meet again at the 7:30pm session.

### 3.3. Closing

#### 3.3.1. Recess for Ad-Hoc Group Work

- 3.3.1.1. JohnF recessed the TG at 5:11 pm.

## 4. 7:30 pm Monday, January 12, 2004

### 4.1. Opening

#### 4.1.1. Call to order

- 4.1.1.1. JohnF called the session to order at 7:40 pm.
- 4.1.1.2. JohnF: Sorry about the delay, but the ExCom meeting delayed us. That meeting could not vote, so we offered to go to recirc ballot by the end of this week. We promised to go to some of the more experienced members with our package.
- 4.1.1.3. Keith Amann (KeithA): That recirculation would be as a preliminary to going straight to sponsor ballot?
- 4.1.1.4. JohnF: Yes.
- 4.1.1.5. Keith A: 15 day?
- 4.1.1.6. JohnF: Yes. Last time we got only 240 comments, and a lot of them were carry-overs. A number of others were from people who haven't been participating and so they missed the other resolved comments. So there probably will be a lot of straight rejections.
- 4.1.1.7. KeithA: Procedurally, will the results of this last letter ballot be announced?
- 4.1.1.8. JohnF: They were announced on the floor.
- 4.1.1.9. KeithA: They generally are announced by the WG chair.
- 4.1.1.10. JohnF: He did announce it briefly. Overall: it was 90% yes (249:29:23), with 94% participation. Having said that, we still received some new comments, so we will give it one more shot and see if the next recirculation doesn't get any critical results, so we can go directly to Sponsor Ballot. Any other questions about what happened tonight?

### 4.2. Closing

#### 4.2.1. Recess

- 4.2.1.1. JohnF: Hearing none, is there any objection to recessing tonight and bringing up comment resolution tomorrow morning? Hearing none, this meeting is recessed until tomorrow morning at 8:00 am.
- 4.2.1.2. JohnF recessed the meeting at 7:52 pm for Ad Hoc work.

## 5. 8:00 am Tuesday, January 13, 2004

### 5.1. Opening

#### 5.1.1. *Call to order*

- 5.1.1.1. JohnF called the session to order at 8:08 am.

### 5.2. Re-summarization of ExCom meeting results

- 5.2.1.1. JohnF: JohnF summarized the situation again for those who were not here when he returned from the ExCom. This ExCom meeting was an ad-hoc, with no formal voting taking place. Relative to the smaller 802 groups, we have fewer comments per capita, but some of the ExCom members still remarked on the fact that we have 240 comments from the latest recirculation ballot.
- 5.2.1.2. JohnF: We have all day today, 8am to 9:30pm, but do not have a session tomorrow. Thursday there won't be much time – probably only one session to resolve comments. What I want to do is get rid of all of the current comments today. I assume that there will be a lot of comment rejections, since a number of people carried the same comments they did last time. [Many] aren't regular participants and haven't paid attention [to the changes that have been made]. If there is a big argument about something, that problem is too hard to solve and I'll rule that we need to move on. On the other hand, if something is really broken, then we'll follow it through.

### 5.3. Procedure Discussion

#### 5.3.1. *Organization of Ad Hoc Groups*

- 5.3.1.1. JohnF: Srini led a group last night that came up with solutions for about 50 comments. These solutions were chosen because they should be non-controversial.
- 5.3.1.2. StephenC: Will we have time for presentations?
- 5.3.1.3. JohnF: I will announce the available presentations, but I don't think we will have time for them. When we divide into groups, make sure you join the relevant group. Srini, what is the number of your new paper?
- 5.3.1.4. SriniK: I put the information in 04/1001r1; all of the comments are in yellow.
- 5.3.1.5. StephenC: [Documents] 0009 and 0010, Admission Control; and 0028 and 0030, Power Management.
- 5.3.1.6. JohnF: For those in the relevant ad-hoc groups, please review those documents.
- 5.3.1.7. SriniK: EDCA, HCCA, Clause 11, Frame Formats, and Everything Else. This division is also shown in document 1001r1. A number of comments that are called technical but really are editorial we attempted to answer [directly].
- 5.3.1.8. JohnF: Please pay attention to the fact that some comments may be invalid. In your group work, please keep your review to less than three minutes per comment.
- 5.3.1.9. JohnF: Who would like to be the points of contact for the groups? I see Menzo for EDCA; Amjad for HCCA; Floyd for Clause 11; Srini for Frame Formats; and no one yet for the Group 5. Lets start with each of the first four groups now. Srini, how many comments are in each group?
- 5.3.1.10. SriniK: There are roughly 35 comments in each of the first two; 40 in Clause 11; 50 in Frame Formats; and 45 in Group 5.
- 5.3.1.11. JohnF: Does everyone agree that we should continue with the ad-hoc group work and reconvene at the 10:30 session? Hearing none, that's what we'll do.

## 5.4. Closing

### 5.4.1. Recess

- 5.4.1.1. JohnF recessed the meeting at 9:56am for ad-hoc work.

## 6. 10:30 am Tuesday, January 13, 2004

### 6.1. Opening

#### 6.1.1. Call to order

- 6.1.1.1. JohnF called the session to order at 10:35 am.

### 6.2. Ad-Hoc Groups

- 6.2.1.1. JohnF: Each of the ad-hoc group leaders: please tell us how many comments you have, how many are resolved, and how many have been rejected.
- 6.2.1.2. Srinik: Clause 7 has 65 comments, 45 are resolved, and the only rejections are editorial comments. Right now I'm in an ad-hoc group of 1 and hope someone will join me. After this I will take up the last group of comments.
- 6.2.1.3. AmjadS: We have only 4 comments to go and are skipping the editorial comments, and should be able to do the rest in about half an hour. We have declined very few.
- 6.2.1.4. MenzoW: We have 35 comments for EDCA and have 11 technical left to resolved. 5 or 6 were rejected, some because they were carryovers from previous letter ballots.
- 6.2.1.5. FloydS: We had a total of about 40, and have addressed about 15 and skipped some editorial. We have skipped about 12 of them because that whole area is controversial and will have to be brought up before the whole Task Group.
- 6.2.1.6. JohnF: My bias is that a controversial area is as likely to cause more "No" votes than "Yes" votes, and so we probably will skip it altogether. If you can have by lunchtime a document on the server, then we can start counting down the 4 hours then. Please bring up the controversial ones this afternoon and then we can decide whether to solve them on the spot.

### 6.3. Closing

#### 6.3.1. Recess for Ad Hoc Group Work

- 6.3.1.1. JohnF: Any objections to going back to ad-hoc work? Hearing none, that's what we'll do.
- 6.3.1.2. The task group session recessed for Ad Hoc group work at 10:44am.

## 7. 1:30 pm Tuesday, January 13, 2004

### 7.1. Opening

#### 7.1.1. Call to order

- 7.1.1.1. JohnF called the session to order at 1:38pm.

## 7.2. Ad Hoc Group Work Review

- 7.2.1.1. JohnF: Our process now will be first to get reports from the ad-hoc groups. Then, while we are waiting for the 4 hour period to elapse, we can listen to presentations on specific groups of comments. Next we can take up some of the issues that need to come to the floor. Finally, in the next session we can take up the resolutions that the Ad Hoc groups have made and cover the remaining comments on the floor.
- 7.2.1.2. AmjadS: We have provided the completed comments to Srinu, who is combining them with the resolutions of his group. We have 7-9 comments left in section 9.9.2.3.
- 7.2.1.3. MenzoW: We have pretty much resolved all of our comments. About 4 of them should be brought before the group. Three of these are covered in one presentation; the fourth can be covered separately in the general TG meeting.
- 7.2.1.4. SrinuK: I (an ad-hoc group of one) addressed about 50 comments; less than 10 remain. The HCCA and Frame Format comment resolutions are in 04/1001r2; that file is in the temp area on the servers.
- 7.2.1.5. FloydS: Power management had 47 comments. We resolved 17; rejected 2; have 8 left; and there are about 15 that need to come to the floor. But we would like to continue in ad-hoc group work for now.
- 7.2.1.6. MathildeB: I have a document number: 04/0073 covers power management and APSD.

## 7.3. Closing

### 7.3.1. Recess for Ad Hoc Group Work

- 7.3.1.1. JohnF: Since all the groups have something to do, how about dedicating the remainder of this session to the ad-hoc work and coming back in the 4:00 pm session? Is that all right? Any objection to recess? Hearing no opposition, that's what we'll do.
- 7.3.1.2. The meeting recessed for Ad Hoc work at 1:52 pm.

# 8. 4:00pm Tuesday Afternoon, January 13, 2004

## 8.1. Opening

### 8.1.1. Call to order

- 8.1.1.1. JohnF called the session to order at 4:05 pm

## 8.2. Ad Hoc Group Reports

- 8.2.1.1. JohnF: I would like the ad-hoc groups to confirm their status.
- 8.2.1.2. AmjadS: We have turned our document over to Srinu. We have resolved all the comments except for 176, which related to a previous decision. We believe that it will be better to introduce this on the floor.
- 8.2.1.3. SrinuK: I am currently in the process of making an r3 of 04/1001. I am done with the Frame Formats comments. There are about 6 comments that I will bring to the floor. Of the "Others" category we have solved about 35 of 52 comments, and believe we can finish those today.
- 8.2.1.4. MenzoW: We have resolved 36 comments; comments 13, 14 and 16 will be covered by a Motorola presentation; and one other will be covered by another paper in the session. Our report has been on the server for about half an hour.



- 8.2.1.5. FloydS: Our group had 46 comments; we have gone through all of them; accepted 25; rejected 4 and 17 are in a controversial area and need be brought before the TG. Mathilde has one presentation that will be cover most of these.
- 8.2.1.6. JohnF: I would like to cover the comments that are not covered by any paper. Who wants to go first with those?
- 8.2.1.7. AmjadS: I will present the comment and proposed resolution for comment 176; and Mathilde can explain it.
- 8.2.1.8. JohnF: Fine. I would appreciate it if we can accelerate these individual comments.
- 8.2.1.9. AmjadS reviewed Comment 176.
- 8.2.1.10. JohnF: Is there any objection to accept this comment? I see at least one, so I'll give the floor to Mathilde to explain what is broken in 6.0 that this fixes. Please summarize your points into 2-3 minutes.
- 8.2.1.11. MathildeB presented document 03/972r2.
- 8.2.1.12. GregC: I like condition 1, because that solves an error. I don't like condition 2, because it presents a potential for abuse. If you don't get a poll, you should wait for your poll.
- 8.2.1.13. MathildeB: I'm with you. So I agree to make that change.
- 8.2.1.14. Anil Sanwalka (AnilS): Point of Order: was the original change to solve a particular comment?
- 8.2.1.15. Srinik: This is about a group of comments that have been around for a while.
- 8.2.1.16. JohnF: This has to be about comments about LB63, not about earlier comments.
- 8.2.1.17. AnilS: But I thought Mathilde was saying that the earlier change did not have to do with a comment?
- 8.2.1.18. MathildeB: No, it was about an earlier comment.
- 8.2.1.19. JohnF: This is about comment 176.
- 8.2.1.20. AmjadS: In response to a previous letter ballot?
- 8.2.1.21. MatthewF: Are you suggesting the text was not changed?
- 8.2.1.22. JohnF: No, this comment is valid.
- 8.2.1.23. Srinik: This comment is valid because it is addressing a change that was made in LB63. But this is undoing a change that was made earlier in this session.
- 8.2.1.24. JohnF: But I don't think we can do that. We cannot open any areas that are closed.
- 8.2.1.25. MatthewF: This is OK for the group to change. We all can change our votes. The key is what is the [possibility of reversing] NO votes? We can change anything we want with a 75% change.
- 8.2.1.26. MarkB: I don't think this is really undoing what was done in Albuquerque. So can you comment: are we directly undoing that?
- 8.2.1.27. MathildeB: Long before Albuquerque we relaxed the access, but with these restrictions. Today we have three NO-vote related comments related to this: 170, 176 and 177. Greg effectively proposed an amendment and I agreed with him. So this is not quite reinstituting the previous restrictions.
- 8.2.1.28. MarkB: What row in Table 20.4 is being changed here?
- 8.2.1.29. AmjadS: There is no change to that table involved here.
- 8.2.1.30. MarkB: [Showed Table 20.4 on the screen.] Is this referring to the first or last row of this table?
- 8.2.1.31. Srinik: I believe it applies to Row 4.
- 8.2.1.32. MathildeB: If we did this, we would have to eliminate the last row.
- 8.2.1.33. Srinik: This would undo Duncan's motion.
- 8.2.1.34. MathildeB: So I would make Row 4 apply to restricted access.
- 8.2.1.35. MarkB: Please add that to the motion.
- 8.2.1.36. JohnF: I believe that we need to judge the risk of getting more "No" votes.

- 8.2.1.37. MathildeB: I move to: Instruct the editor to modify the text in subclause 9.9.2.3 of the TGe draft to permit use of EDCA to transmit MSDUs belonging to traffic streams for which there is a strict HCCA policy under the following conditions:
1. The MSDU has been sent previously but an acknowledgement has not been received
  2. When frames associated with a TSPEC are transmitted over contention-based channel access, they shall use the EDCA parameters associated with the UP specified in the TSPEC.
- Modify Table 20.4 accordingly.
- 8.2.1.38. GregC: Second.
- 8.2.1.39. JohnF: Is there any discussion?
- 8.2.1.40. AnilS: I speak against this because not of what is in the motion, but that we don't need to keep going back and forth on this topic.
- 8.2.1.41. SriniK: I am also of the same opinion. If the commentator thinks this is needed, we need to get a different solution than going back.
- 8.2.1.42. JohnF: I will allow one comment in favor of this, and then Mathilde to reply.
- 8.2.1.43. GregC: I speak in favor of this motion. I was not at that meeting, and would have worked with Duncan to come to this resolution if I had been there at that time.
- 8.2.1.44. MathildeB: the motion last time was made at the end of the meeting without sufficient discussion, and that's why we're trying to do this now.
- 8.2.1.45. JohnF: Is there any reason not to close the discussion? Seeing none, we will take a vote. The motion is technical and passes 15:2:5.
- 8.2.1.46. MarkB: I have one comment on PowerSave that is independent of the other PowerSave papers. This is Comment 75. Note that the EOSP bit does not reside in all frames, unlike the More Data bit. My proposal is to update the frame exchange rules to accommodate this.
- 8.2.1.47. MarkB: I move to instruct the editor to make the changes in 9.9.2.3.
- 8.2.1.48. SriniK: I would appreciate your support to draft the text on this. I have been reading many resolutions that say to instruct the editor to make general changes.
- 8.2.1.49. JohnF: Actually those are invalid comments and should be rejected.
- 8.2.1.50. JohnF: Menzo, do you want to put Comment 144 up on the screen?
- 8.2.1.51. MenzoW reviewed Comment 144.
- 8.2.1.52. MenzoW: This is a problem in the draft. There is no way to have multiple TSPECs assigned to a single priority. The common feeling was that you could not have more than one TSPEC per AC. So we thought the best [solution] was to have the alternate resolution shown in the comment resolution document now. You could have one TSPEC for voice and two for video, for instance. So the proposal is to use a TID instead of an UP to identify the TSPEC.
- 8.2.1.53. SriniK: This truly becomes a traffic stream then.
- 8.2.1.54. MenzoW: There is no change on the data frame level or QoS control. Now you just reference the TSPEC with the unique value.
- 8.2.1.55. SriniK: I think this is a substantial change. Is this within our mandate here? This needs to be thought out.
- 8.2.1.56. MenzoW: I don't want to rush this through; we just needed to answer this comment.
- 8.2.1.57. JohnF: I can rule this as an invalid comment
- 8.2.1.58. KeithA: This is a valid issue.
- 8.2.1.59. JohnF: But we can't just tell Srini to "make up an answer".
- 8.2.1.60. KeithA: I agree with that.
- 8.2.1.61. MenzoW: We can work on a solution.

- 8.2.1.62. JohnF: We need a solution or we will need to reject the comment.
- 8.2.1.63. AnilS: There is no reason to reject the comment; it is a serious problem.
- 8.2.1.64. GregC: I would like to help Menzo work on this.
- 8.2.1.65. AmjadS: I will also.
- 8.2.1.66. JohnF: So I will table this comment, pending your proposal. Floyd, please address the comments from your group that are not part of the papers.
- 8.2.1.67. FloydS: Comments 75 and 69. I believe 69 is related to Mark's comment.
- 8.2.1.68. MarkB: We could accept this comment.
- 8.2.1.69. FloydS: So we will table this one for now and make a separate motion.
- 8.2.1.70. JohnF: Is there any objection to accepting the recommended change for comment 69?
- 8.2.1.71. MathildeB: But that recommendation includes no normative text.
- 8.2.1.72. JohnF: In that case it is an invalid comment and should be rejected.
- 8.2.1.73. FloydS: Next is comment 149, by Keith.
- 8.2.1.74. KeithA: The problem is that, if a device is operating in APSD mode and it is receiving frames at different priority levels, all those frames are being released into the Tx queues at the same time, [and so] there is a problem with the backlogs in the various queues. The problem is that the mechanism in the existing draft has this problem. I'm willing to discuss the recommended change, to remove all the related text that was introduced in 03/661.
- 8.2.1.75. JohnF: If you pull that text, will you create a hole in the draft?
- 8.2.1.76. KeithA: I'm willing to accept a rejection of this comment, since the solution isn't worked out yet.
- 8.2.1.77. FloydS: I want to make a motion to reject this comment.
- 8.2.1.78. JohnF: Do I have a second?
- 8.2.1.79. MarkB: Second.
- 8.2.1.80. JohnF: I allow 3 minutes for discussion.
- 8.2.1.81. Mathilde: I move to table this motion.
- 8.2.1.82. GregC: Second.
- 8.2.1.83. JohnF: This [the motion to table] is an undebatable motion; is there any objection to this motion to table? I hear none, so it is tabled. However, you have to remember to take it off the table, or I will bring it up again later.
- 8.2.1.84. KeithA: Comment 150. We still don't have a real solution, so I am willing to accept a rejection of this one.
- 8.2.1.85. JohnF: Is there any objection to reject the comment? Hearing none, it will be rejected.
- 8.2.1.86. FloydS: Comment 273 is open because we didn't have knowledge of BlockAcks in our group. I move to accept this comment.
- 8.2.1.87. JohnF: Is there any objection to accept this comment? Hearing none, this comment is accepted. Are there any other separate comments?
- 8.2.1.88. MathildeB: I have comments 179 and 146.
- 8.2.1.89. SriniK: 179 was accepted by the Clause 11 Ad Hoc group.
- 8.2.1.90. MathildeB: So we will cover comment 146.
- 8.2.1.91. FloydS: This is one we will cover in the papers.
- 8.2.1.92. JohnF: We're late for those papers. So I would like to go ahead with the papers. 5 minutes per paper; we don't have time for more. You need just to summarize your points and come to a motion. The first thing I want is the list of comments this paper addresses

### **8.2.2. Document 04/0030r0, APSD Traffic, Steve Emeott**

- 8.2.2.1. SteveE: This presentation covers comments 16-23, 8, 146, 178, 305-6, and 309.
- 8.2.2.2. SriniK: Some of those comments are solved by the ad hoc groups, what is to be done with those resolutions?

- 8.2.2.3. JohnF: If this proposal solves those and is voted in, then that's the solution we'll use.
- 8.2.2.4. JohnF: I would like Mathilde to present her paper on Comment 146 and then we'll entertain questions and motions. Lets look at both points of view.
- 8.2.2.5. GregC: Are we good until 9:30 tonight?
- 8.2.2.6. JohnF: Yes, but I want to finish up on this topic by 6 pm.
- 8.2.2.7. MathildeB: Document 04/0062r0 we went through yesterday. At that time I argued that these are basically editorial items. There is a conflict between the text in sections in 7.1.3.5.2 and 11.2.1.5, on the one hand, and other sections of Draft 6.0, on the other hand. Comment 179 basically requests that we fix these editorial points, just to be consistent with what we have already voted. So these are just editorial cleanups. This makes no technical changes to what we voted into the draft in Albuquerque. Comment 146 is about an inconsistency in the draft – we don't want to bias the delivery of frames in favor of APSD stations. The AP has to deliver one frame to tell the STA to go to sleep, so I suggest that we put at least one frame here – with no other restrictions.
- 8.2.2.8. JohnF: I would like the other presenter to come up and we can address questions and entertain motions.
- 8.2.2.9. FloydS: For Mathilde: for comment 179 we accepted this resolution.
- 8.2.2.10. GregC: Mathilde addresses two comments. Steve's document addressed more comments. On those two comments what's the difference?
- 8.2.2.11. SteveE: I didn't address 179.
- 8.2.2.12. GregC: So we don't have to address 179 here, since that's accepted by the ad hoc group. So now lets drill down to 146.
- 8.2.2.13. SteveE: For 146 one question is when is the service period allowed to end.
- 8.2.2.14. GregC: So you're saying it ends whenever you stop transmitting to that station, for whatever reason?
- 8.2.2.15. MathildeB: The argument is over when you can set that. I argue to let the AP decide.
- 8.2.2.16. GregC: So I agree with that, within all other restrictions. So what's different about the other proposal?
- 8.2.2.17. SteveE: Just more restrictions.
- 8.2.2.18. GregC: Since we're not designing a scheduler, then this seems to be a small issue and not a big issue.
- 8.2.2.19. AmjadS: Comment 28 says to deliver all traffic.
- 8.2.2.20. GregC: That makes it an unbounded service period, which you don't want.
- 8.2.2.21. StephenC: These two solutions are apples to oranges, and should not be put together.
- 8.2.2.22. MathildeB: Steven is adding more restrictions. I believe in letting the frames be transmitted.
- 8.2.2.23. JohnF: On 146, does need any more clarification?
- 8.2.2.24. MathildeB: Can we ask the commentator what he would accept?
- 8.2.2.25. JohnF: But he is not here. So we can't do that. If there are no more questions, I'm going to put it to vote.
- 8.2.2.26. MarkB: But Steve's paper covers many different comments also.
- 8.2.2.27. MathildeB: Steve's proposal undoes a lot of other resolutions.
- 8.2.2.28. JohnF: On comments 16-23, is there an alternate resolution?
- 8.2.2.29. MathildeB: Yes, to reject this proposal. It also is addressed with 04/0073.
- 8.2.2.30. JohnF: Is there an alternate resolution to comment 178?
- 8.2.2.31. MathildeB: Yes, document 04/0073.
- 8.2.2.32. JohnF: Comment 305.
- 8.2.2.33. MathildeB: 305 is similar to 178 and also is solved by 04/0073.

- 8.2.2.34. JohnF: Comment 306.
- 8.2.2.35. FloydS: I have a comment related to this.
- 8.2.2.36. JohnF: Let me continue on these for the moment. Do you have an alternate resolution to this?
- 8.2.2.37. MathildeB: I have no alternate to Steven's on that.
- 8.2.2.38. JohnF: Comment 309?
- 8.2.2.39. MathildeB: I have no alternate to Steven's on that.
- 8.2.2.40. JohnF: Comment 8?
- 8.2.2.41. MathildeB: 04/0073 also addresses that.
- 8.2.2.42. JohnF: Steve, can you separate out those comments?
- 8.2.2.43. SteveE: No, it's really one proposal.
- 8.2.2.44. JohnF: So we have alternate resolutions to 305, 178 and 8.
- 8.2.2.45. FloydS: Comment 178 is an informative annex.
- 8.2.2.46. AmjadS: Call for orders of the day.
- 8.2.2.47. JohnF: Ok, the time is up; we go for dinner.

### 8.3. Closing

#### **8.3.1. Recess for Ad Hoc Group Work**

- 8.3.1.1. The session recessed until the next session at 6:03 pm.

## 9. 7:30pm Tuesday Evening, January 13, 2004

### 9.1. Opening

#### **9.1.1. Call to order**

- 9.1.1.1. JohnF called the session to order at 7:50 pm.
- 9.1.1.2. JohnF: Has anyone seen the previous presenters? Mathilde is here, but I don't see anyone from the other group. Hearing none, we'll move on to other things.
- 9.1.1.3. MathildeB: May I make my motion?
- 9.1.1.4. JohnF: I believe we should let Srinu present first, then, if they don't show up in that time, we'll move on.

#### **9.1.2. Document 04/1001r4, Srinu Kandala**

- 9.1.2.1. SrinuK: This is about Comment 71. I want to thank Mathilde for resolving this issue. Is there any objection to changing nothing in the document and adopting the resolution in Mathilde's presentation on 176 and 177? Hearing none, that's what I'll do. My proposal is to accept the Recommended Disposition in 04/1001r4 as the response to this comment. Any objections? I hear none.
- 9.1.2.2. SrinuK: Comment 78. On the surface this looked fine, but I believe I should wait for the results from other comments before evaluating this.
- 9.1.2.3. MathildeB: Basically we said the AP has to receive an ACK to the frame before it assumes it got through. Otherwise it needs to follow the other rules.
- 9.1.2.4. SrinuK: I agree, but believe this is not in conflict with the recommended change. This recommendation looks more editorial than anything else. But I don't understand how this is solving the missing ACK problem.
- 9.1.2.5. MarkB: I believe the commentator is saying that, when you send ESOP = 1, you go into this other transmission state.
- 9.1.2.6. SrinuK: So any objections to accepting this recommended change? I hear none.

- 9.1.2.7. SрниK: Comment 94. I do not see why the current text is incorrect. The TSID still has 4 bits, but just with the range 8 to 15. Leaving it as TSID makes sense to me, so I would like to decline the comment, especially since we already have an UP field. Any comments? Hearing no comments, any objection to declining this comment? So now the resolution is "Comment declined." with an explanation. Any comments on this? Hearing none, any objections to accepting this resolution? Hearing none, that's it.
- 9.1.2.8. SрниK: Comment 131. A similar comment was rejected in the previous letter ballot because no normative text was available.
- 9.1.2.9. AmjadS: That normative text is in Document 03/973r1.
- 9.1.2.10. SрниK: Ok, we can come back to that later.
- 9.1.2.11. SрниK: Comment 201. That restriction was put in because some implementations out there use this. Any comments? Hearing none, I would like to decline this. Are there comments on this resolution. Hearing none, are there any objections to making the resolution "Comment Declined"?
- 9.1.2.12. GregC: I'm with you on this.
- 9.1.2.13. SрниK: Hearing no objections, that's it.
- 9.1.2.14. SрниK: I just talked to the chair and he stated that, since we've already had the 03/973r1 paper for some time, we don't need a presentation. I am against making that proposed change because it involves additional changes without sufficient reason.
- 9.1.2.15. AmjadS: It allows additional airtime and allows some applications to allow certain error rates.
- 9.1.2.16. SрниK: I agree that it depends on the application.
- 9.1.2.17. GregC: If all applications set every TSPEC acceptable frame loss rate to 0, what does the AP do?
- 9.1.2.18. MarkB: Why not just specify the number of acceptable retries?
- 9.1.2.19. GregC: I understand the motivation, but it's splitting hairs pretty fine here. Once applications learn that an AP will give them preferential treatment if they can't tolerate dropped frames, then they'll ask for higher requirements than they need.
- 9.1.2.20. SрниK: Point of order: This is a new comment from the commentator, but similar comments have been made before.
- 9.1.2.21. JohnF: So this does not address any changes in the draft?
- 9.1.2.22. AmjadS: Point of order, I made this comment earlier and carried this comment from the previous ballot, so we need to decide this.
- 9.1.2.23. GregC: But it is a huge task to define acceptable frame loss rates. This basically is asking for a specific scheduler design.
- 9.1.2.24. AmjadS: So there are two questions: first, do we want to specify the behavior of a scheduler? I agree that none of us want to do that. The second is that we clarify the terms for use by others.
- 9.1.2.25. Andrew Estrada (AndrewE): I agree with Greg. This is going too far toward defining a schedule.
- 9.1.2.26. JohnF: We've spent too much time on this. We need to make a decision. Does anyone want to hear the actual text? Hearing none, is there any objection to accepting the Recommended Change proposed?
- 9.1.2.27. AmjadS: Point of order. I move to reject this comment.
- 9.1.2.28. AndrewE: Second.
- 9.1.2.29. AmjadS: The objections I have heard against this information field do not have a strong foundation. Most don't understand the need for this: in order to support the applications that demand less resources to increase the likelihood that they get accepted. But how else can the AP know what is needed?
- 9.1.2.30. AndrewE: It can learn by other means.
- 9.1.2.31. AmjadS: The scheduling mechanism itself has no other way to learn what the needs of the application are. But Greg pointed out that we are not going to

- specify the scheduler. There is more clarification is needed to understand what it is. So my motion is to put this off until we have more treatment later.
- 9.1.2.32. Srinik: I would not like to put things in that are not complete; that would be very counterproductive. So we should wait for a more complete proposal.
- 9.1.2.33. MathildeB: My understanding is that Amjad would like to have time to make a presentation. Is it all right to move to table this?
- 9.1.2.34. JohnF: It is my responsibility to move this on; we have tabled a lot of things, so it is unlikely that we will get them off the table. What is the vote on the motion to table?
- 9.1.2.35. JohnF: The motion to table is undebatable and fails with 2:8:10.
- 9.1.2.36. Srinik: I call the question.
- 9.1.2.37. AndrewE: Second.
- 9.1.2.38. JohnF: Vote on calling the question. The motion to call the question passes unanimously 12:0:1.
- 9.1.2.39. JohnF: So now we vote on the main motion on rejecting the recommended change. The motion in favor of rejecting this recommended change passes with 10:1:6.
- 9.1.2.40. JohnF: I would like to go back to the previous proposal by Steven. If this motion passes, there is no more discussion on these comments. If it fails, however, Mathilde will present on the other comments. Is there any objection to following this process?
- 9.1.2.41. FloydS: We would like to have some more discussion.
- 9.1.2.42. JohnF: I would prefer not to do that. We already have a number of ad hoc presentations, other presentations and tabled issues that have to be moved to Thursday. We won't get to those if we have more discussion. There only is a half hour to go today. Mathilde already has motions ready and I asked her to put those off until you showed up with Steven's motions first. If you want to consult with your group, I can recess for a few minutes for you to concur.
- 9.1.2.43. FloydS: We would like to have more discussion.
- 9.1.2.44. JohnF: We can have discussion about your motion.
- 9.1.2.45. AmjadS: Point of order. If we address some issue in this meeting, we cannot discuss it again in this meeting?
- 9.1.2.46. JohnF: Yes, Mathilde is going to go ahead otherwise, and then we could not have Floyd's or Steven's motion.
- 9.1.2.47. FloydS: Then we'll go ahead with our motion.
- 9.1.2.48. FloydS: I move to adopt the changes identified in document 11-04-0028-00-000e into the current TGe draft.
- 9.1.2.49. Thomask: Second.
- 9.1.2.50. JohnF: Are there comments?
- 9.1.2.51. KeithA: I have read this document and found one key issue: that legacy power saving mode text has been eliminated and replaced with the QAP does this. This breaks the legacy power save mechanism and creates an undefined state that needs to be resolved. But my main problem is that we need more definition.
- 9.1.2.52. FloydS: I speak for the motion. That was not our intention and believe that is a misinterpretation of the text. The partial virtual bitmap is still there, but is being used for other traffic.
- 9.1.2.53. MarkB: I have a question about the TIM bit and the More Data bit. There's the high priority APSD buffer is not being shown by the TIM bit.
- 9.1.2.54. StevenE: Yes that is correct.
- 9.1.2.55. MathildeB: I speak against this motion. I believe it re-engineers the architecture of the power saving and overturns the motions of the last meeting. I feel this proposal is going to eliminate the possibility of optimization, possibly by giving the AP more options with transmissions.
- 9.1.2.56. JohnF: Who else is ready to speak for this motion? Seeing none, Greg is next.

- 9.1.2.57. GregC: I think this motion tries to fix three things: there are mistakes in the draft, but [the way] to fix them is not to add more rules. So I would urge the group not to add more rules just because we don't trust the scheduler writers. If it were possible to split that out, I would say to vote it down. The other two thirds of this proposal address legitimate gripes – the trigger and one other. Since we have to take the whole, I can't vote for this right now. I'll at least have to abstain on this. We'll just have to fix those bugs some other way.
- 9.1.2.58. FloydS: Ultimately this [topic] is just how to reduce the number of "No" votes. Yes this is very complex. Mathilde has been going at the problems one-by-one, but I believe she will not be able to solve as many problems as this proposal does.
- 9.1.2.59. ThomaskK: I would like to speak in favor of this motion. I agree with Greg, but believe that there are better compromises here. If we try to split things out, we break more.
- 9.1.2.60. AmjadS: I would like to speak against accepting this motion. This is a complex proposal that addresses not only policy, but touches on EDCA and HCCA. It needs some work before we adopt it into the standard. I believe it may introduce more problems than it resolves and could cause more "No" votes. I wish I had more time to review the whole thing. I believe there are self-contradictory statements in the proposal. At one time it says QAP shall buffer all traffic for a non-AP QSTA that is in power save time. But at another time it says not to buffer traffic, except for an APSD that was negotiated. But what about the QSTAs that did not have that negotiation? So I don't feel comfortable with introducing this text.
- 9.1.2.61. FloydS: I hope I'm not being facetious, but I don't think you've understood the whole thing. The APSD mode [needs to be negotiated].
- 9.1.2.62. AmjadS: But what happens to those in the legacy power save mode? The scenario is that the legacy power save is not negotiated, to QAP is required to buffer the traffic, but the AP would never wake it because the STA has not negotiated that.
- 9.1.2.63. StevenE: By setting APSD to 1 it has access to the data by observing the TIM and More bits.
- 9.1.2.64. AmjadS: I believe you're saying that the legacy and new power save modes are connected. But they are not.
- 9.1.2.65. SrinikK: There has been a great deal of debate and perhaps misunderstanding. If we want to having too many new comments, I believe we should move forward and only insert foolproof text that we won't have to pull out. Having said that, I call the question.
- 9.1.2.66. JohnF: Do I hear a second to calling the question?
- 9.1.2.67. GregC: Second.
- 9.1.2.68. JohnF: Is there any objection to calling the question? Seeing none, the question is called and we vote.
- 9.1.2.69. JohnF: This is a technical motion and it fails with a vote of 4:11:7. So those comments are still open. So Mathilde goes next. If Mathilde's proposal fails as well, then there will be another opportunity to revisit this subject.

### **9.1.3. Document 04/0062r0, Mathilde Benveniste**

- 9.1.3.1. Mathilde: This presentation was made yesterday. I believe this is a set of editorial changes. First is the proposal is for comment 146. This is to relax the buffering requirement on the AP and allow it to decide how many frames to send down. I move to adopt this change into the draft.
- 9.1.3.2. IvanO: When you say "frame" do you mean just any type of frame? May I suggest [limiting it to a buffered frame]?
- 9.1.3.3. Mathilde: Good point. Any objections to my changing it? Hearing none.
- 9.1.3.4. JohnF: This is now a new document, r1. Please write the motion explicitly about document revision r1.
- 9.1.3.5. GregC: How about changing it to "one or more"?



- 9.1.3.6. MathildeB: I do need to change it to add “, if one is buffered”.
- 9.1.3.7. GregC: Can the AP respond to a Null?
- 9.1.3.8. MathildeB: There would be no advantage. This should perform at least as well to a PS Poll.
- 9.1.3.9. GregC: If the AP is trying to get service time for another STA, why do we require it to send this possibly big frame rather than a QoS Null?
- 9.1.3.10. JohnF: Mathilde, is your motion complete?
- 9.1.3.11. MathildeB: Yes.
- 9.1.3.12. JohnF: We have less than 15 minutes. Do I have a second?
- 9.1.3.13. KeithA: Second.
- 9.1.3.14. AndrewE: I move to amend to “if at least one is buffered”.
- 9.1.3.15. SriniK: Second.
- 9.1.3.16. JohnF: Any discussion on the motion to amend? Hearing none. Is there any objection to the motion to amend? Hearing none, the new motion is as amended, as is now shown. Now we can discuss this new motion.
- 9.1.3.17. FloydS: This wording seems ambiguous.
- 9.1.3.18. MathildeB: This applies just when you have buffered MPDUs.
- 9.1.3.19. KeithA: Is this about repeated failures to send, or is just one attempt enough?
- 9.1.3.20. MathildeB: To address the lost ACK problem the AP can attempt a couple of times and stop without exhausting the retry limit. Floyd, I believe that is why the language is this way.
- 9.1.3.21. SteveE: I would like to make it clear that the service period doesn’t end just because these attempt have stopped.
- 9.1.3.22. MathildeB: Absolutely.
- 9.1.3.23. JohnF: Any more discussion? Hearing none, the question is called. The motion is technical and passes unanimously with 13:0:8.
- 9.1.3.24. MathildeB: The rest of the comments are addressed in Document 04/0073. But many have not been able to review this,
- 9.1.3.25. JohnF: What about the other comments that still are not covered, comments 305 etc.? Does anyone else have proposals for those?
- 9.1.3.26. JohnF: I suggest that you present with the other papers Thursday morning. Also, Floyd, other than 146 the other comments are still open, so you have another shot at them. Next paper please. We only have 6 minutes left.

#### **9.1.4. Document 04/0010r1, Steven Emeott**

- 9.1.4.1. StevenE: This paper addresses comments 13-15. The normative text is in Document 04/0009.
- 9.1.4.2. GregC: If a station wants to reserve some bandwidth from the AP, but doesn’t have a PS issue, and just wants to get the data in ASAP with EDCA, then you do that with 0.
- 9.1.4.3. StevenE: You just want to distribute the traffic across time.
- 9.1.4.4. MarkB: I would like to hear from Srini: should we do this in another section? Are we better served by including this or not?
- 9.1.4.5. SriniK: If this motion passed, we could do it either way – separately now in 9.9.3.1 and later make an editorial change.
- 9.1.4.6. MathildeB: The statement about the element of the TSPEC is part of the draft already. The way the terms are used in this presentation are inaccurate; a TSPEC has a single service start time; there is no next service start time. I can’t make anything out of the last paragraph on Slide 6. So I’m concerned with including this text. I believe it will open up many more comments.
- 9.1.4.7. StevenE: There’s no intention to be confusing. We can discuss the terminology. The goal is just to fill in a hole on what the AP can do to service this request.

- 9.1.4.8. JohnF: We are now out of time, so this session is over. Everyone, if you want to address a comment, make sure you get your presentation onto the servers tomorrow, so we meet the 4-hour rule for Thursday morning.

## 9.2. Closing

### 9.2.1. Recess

- 9.2.1.1. The session recessed at 9:38 pm.

## 10. 8:00 am Thursday, January 15, 2004

### 10.1. Opening

#### 10.1.1. Call to Order

- 10.1.1.1. JohnF called the session to order at 8:08 am.

### 10.2. Discussion of Procedures

- 10.2.1.1. JohnF: We need to limit discussion of each group of comments. Srimi, do we have proposed resolutions for all of the comments? How are these comments put into groups?
- 10.2.1.2. SrimiK: 04/1001r4 contains all solutions and has been on the server since Tuesday night. Only one comment in this group remains to be resolved. Documents 128r3 and 130r1 cover other blocks of comments. Menzo also has said he would present a paper with normative text.
- 10.2.1.3. JohnF: Does anyone else have papers proposing resolutions?
- 10.2.1.4. FloydS: I have two papers addressing comments 8, 17, 18, 20, 21, 23, 74, and 149.
- 10.2.1.5. JohnF: Anyone else have proposals? Hearing no one else, we will start with Floyd's presentation. If those proposals pass, then we will not treat those comments in the later comment resolutions. If that fails, we'll entertain the other proposed solutions to these comments.
- 10.2.1.6. SrimiK: Document 04/1001r4 has the output of all of the ad-hoc groups and contains about 150 comments; 04/0128r3 resolves about 25-30 comments; and 04/0130r1 resolves about 25 comments.
- 10.2.1.7. JohnF: The procedure will be for you to review on your own the papers and, when we bring the papers up, to take exception to any of the comments, and then we'll follow that with your proposal for those comments. Note that you have to make an explicit proposal for resolution, not just to say something is a problem. We need to try to wrap up the whole thing by lunchtime, 12:30 pm. So now we have 10 minutes for each of the two papers from Floyd.
- 10.2.1.8. StephenC: I will need much less time than Floyd.
- 10.2.1.9. JohnF: So I'll give 15 minutes for Floyd, including questions, and then 5 minutes for discussing the motion. And for Stephen's I'll give 5 minutes for the paper and another 5 minutes for discussion.
- 10.2.1.10. FloydS: My presentation can treat individual comments.
- 10.2.1.11. JohnF: So it will be 7 motions?
- 10.2.1.12. FloydS: Yes.
- 10.2.1.13. JohnF: Since we have discussed these topics already, I'll give you 2 minutes each and we'll try to get the whole paper done in 30 minutes. Then I'll set 10 minutes for Stephen's paper and the related vote.

**10.2.2. Document 04/0133r0, Chapter 11 Comment Resolution, Floyd Simpson**

- 10.2.2.1. FloydS: First we'll describe the trigger issue, comment 21. My motion is presented in the slide titled "Trigger; 11.2.1.4" of this document.
- 10.2.2.2. KeithA: Are we going to cover all of the comments together first?
- 10.2.2.3. FloydS: I will be covering the comments one at a time.
- 10.2.2.4. AmjadS: QoS Null frame doesn't contain data.
- 10.2.2.5. FloydS: But it can be sent in a data stream, so it has the same fields.
- 10.2.2.6. SriniK: How is this being associated? I believe you are using PSID? The rest of the text doesn't seem to match this. When you set the APSD subfield to 1, I have always been under the impression that UP is undefined. But this changes that.
- 10.2.2.7. FloydS: That was not my understanding. All of the other fields are still valid.
- 10.2.2.8. AmjadS: Does this begin at any data frame? Which frame is the trigger?
- 10.2.2.9. FloydS: There's only one trigger in all of this. The station will wake up after the end of the previous service period. So this will be first after that.
- 10.2.2.10. MathildeB: How about adding a clarification at the end?
- 10.2.2.11. JohnF: Don't worry about editorials.
- 10.2.2.12. KeithA: I'd add "or bi-directional" after "uplink".
- 10.2.2.13. FloydS: Good; am doing that.
- 10.2.2.14. JohnF: Please put this document, containing this revised motion, on the server as r1.
- 10.2.2.15. FloydS: Will do. So now my new motion includes these words.
- 10.2.2.16. JohnF: Is there a second to this motion?
- 10.2.2.17. Mathilde: Second
- 10.2.2.18. JohnF: Is there any objection? I see one, so we will vote. This motion is technical and passes 8:1:7.
- 10.2.2.19. FloydS: EOSP Issue, Comment 149. My motion is on the slide titled "EOSP; 11.2.1.4".
- 10.2.2.20. JohnF: Is there a second to this motion?
- 10.2.2.21. SriniK: Second
- 10.2.2.22. JohnF: We are running out of time, so we will try to pass all of the proposals that have no objection first, then later come back to the ones that we've put aside. Since we've taken up the whole time for this paper already, we'll have to take up the rest of the paper later. In the meantime, is there any objection to this motion? I see one, so we'll put that aside and come back after the next papers.

**10.2.3. Documents 04/0098r1 and 04/0004r0, More Data Bit, Stephen Chen**

- 10.2.3.1. StephenC presented document 04/0098r1 on the More Data Bit, Comment 74.
- 10.2.3.2. FloydS: I move to accept the normative text in Document 11-04-0004-00-000e.
- 10.2.3.3. JohnF: Is there a second to this motion?
- 10.2.3.4. SriniK: Second for discussion. However, I believe these bits may be used in other ways now.
- 10.2.3.5. AmjadS: I believe there are four categories, best effort, etc. So what do we do with this new category?
- 10.2.3.6. StephenC: All traffic streams have to be mapped to one of these 4 ACs. You can see the mapping in the table in the normative text.
- 10.2.3.7. JohnF: Is there any objection to accepting this motion? I see one, so we will vote. This motion fails 3:4:6.

**10.2.4. Document 04/0100r0, Contention Based TSPEC, Menzo Wentink**

- 10.2.4.1. MenzoW: This is on Comment 144. It is not clear what happens when you have more than one TSPEC, so this is a proposal of what to do.
- 10.2.4.2. MenzoW: I move to accept the normative text in Document 11-04-0100-00-000e as the recommended disposition for Comment 144.
- 10.2.4.3. JohnF: Is there a second to this motion?
- 10.2.4.4. SriniK: Second.
- 10.2.4.5. JohnF: Again, if there is any objection we will have to take this paper up later. I see one objection, so we will take this up after the three big papers.
- 10.2.4.6. JohnF: Please review the next document, 04/1001r4 for the next 15 minutes, and determine what comments you want to take exception to. We are not recessing, so please ask Srini for any clarifications you need offline over the next 15 minutes.

**10.2.5. Document 04/1001r4, Srini Kandala**

- 10.2.5.1. SriniK: I move to accept the entries in "recommended disposition" cells in the document 04/1001r4 as the resolutions for the comments that are marked green and yellow, with the exception of comments 156, 180 and 247. Further instruct the editor to incorporate the suggested change in the recommended disposition into the next TGe draft.
- 10.2.5.2. JohnF: Is there a second to this motion?
- 10.2.5.3. Mathilde: Second.
- 10.2.5.4. Bob Miller (BobM): I believe this is too sweeping and will generate more "No" votes.
- 10.2.5.5. SriniK: About 80 of these are really more editorial. I have reviewed every one of these resolutions and believe them to be non-controversial.
- 10.2.5.6. BobM: I retract that objection, then.
- 10.2.5.7. JohnF: Is there any objection to accepting this motion as shown on the screen? I see none, so this motion passes unanimously.

**10.2.6. Recess**

- 10.2.6.1. JohnF: This time I will recess 15 minutes for you to review the next paper, 04/0128r3. Please review that and bring up any exceptions you have to Srini for his motion.

**10.2.7. Opening**

- 10.2.7.1. JohnF: Calling the meeting back to order, I hope you enjoyed reviewing the paper 04/0128r3. Are there any comments that you have alternate proposals for? Also, Mathilde asked whether, if we vote Yes now, we are restricted for further proposals that affect some of these. The answer yes, except for the exceptions we wish to make now.
- 10.2.7.2. AmjadS and StephenC: Except comment 54.
- 10.2.7.3. SriniK: Also comment 287.

**10.2.8. Document 04/0128r3, Srini Kandala**

- 10.2.8.1. SriniK: I move to accept the entries in "recommended disposition" cells in the document 04/0128r3 as the resolutions for the comments, with the exception of comments 54 and 287. Further instruct the editor to incorporate the suggested change in the recommended disposition into the next TGe draft.
- 10.2.8.2. MathildeB: Second
- 10.2.8.3. JohnF: JohnF: Is there any objection to accepting this motion as shown on the screen? I see none, so this motion passes unanimously.

**10.2.9. Recess**

- 10.2.9.1. JohnF: Again I will recess 15 minutes for you to review the next paper, 04/0130r1. Please review that and bring up any exceptions you have to Srini for his motion. We will reconvene at 9:57, leaving 3 minutes for the motion and vote before the break.

**10.2.10. Opening**

- 10.2.10.1. JohnF: Calling the meeting back to order. Are there any comments listed in 04/0130r1 that you have alternate proposals for?
- 10.2.10.2. FloydS: Except comments 8, 17, 18, 20, 21, 23 and 149.
- 10.2.10.3. SriniK: 149 is not in this document.
- 10.2.10.4. FloydS: Then there is no resolution for 149.
- 10.2.10.5. JohnF: Srini, please check the status of comment 149 during the break.
- 10.2.10.6. AnilS: Also you need to pull 21, to get the earlier resolution in place.
- 10.2.10.7. SriniK: Agreed. But we also need to except comment 373.

**10.2.11. Document 04/0130r1, Srini Kandala**

- 10.2.11.1. SriniK: I move to accept the entries in the "recommended disposition" cells in the document 04/0130r1 as the resolutions for the comments, with the exception of comments 8, 17, 18, 20, 21, 23, 280 and 373. Further instruct the editor to incorporate the suggested change in the recommended disposition into the next TGe draft.
- 10.2.11.2. MathildeB: Second
- 10.2.11.3. JohnF: Is there any objection by any voting member to accepting this motion as shown on the screen? I see and hear no objection, so this motion passes unanimously.

**10.3. Closing****10.3.1. Recess**

- 10.3.1.1. JohnF: In the next session we will come back to the other comments, including the ones we had to postpone earlier. We have only 11 comments to go, so it is reasonable to assume we can get them done in the next 2 hours of meeting. We're out of time in this session.
- 10.3.1.2. The meeting recessed at 10:02 am.

**11. 10:30 am Thursday, January 15, 2004****11.1. Opening****11.1.1. Call to order**

- 11.1.1.1. JohnF called the session to order at 10:30am.

**11.1.2. Procedures**

- 11.1.2.1. JohnF: Srini, did we approve anything on Comment 149?
- 11.1.2.2. SriniK: No, that is yet to be taken up.
- 11.1.2.3. JohnF: Welcome back. We will start now with the individual comments. First I will classify some of these comments as low hanging fruit and give 5 minutes to each. If we can't come to a conclusion in that time, we'll postpone those, and likely will end up rejecting the remaining comments.
- 11.1.2.4. SriniK: I have a list of really low hanging fruit, 5 comments.

11.1.2.5. JohnF: You have 20 minutes for the whole group.

**11.1.3. Comment 54, Srini Kandala**

11.1.3.1. SriniK: I move to accept the entry in the "recommended disposition" cell for comment 54 in the document 04/1001r5 as the resolution for the comment. Further instruct the editor to incorporate the suggested change in the recommended disposition into the next TGe draft.

11.1.3.2. JohnF: Is there a second to this motion?

11.1.3.3. DavidH: Second.

11.1.3.4. JohnF: Is there any objection to passing this motion?

11.1.3.5. AnilS: This paragraph tries to describe the two sides. I believe it needs to be reworded.

11.1.3.6. SriniK: This is a technical change, and that would only be editorial.

11.1.3.7. AnilS: The commentator was not requesting a technical change.

11.1.3.8. SriniK: But that is needed to answer the problem statement.

11.1.3.9. JohnF: Is there any objection to accepting this motion? I see none, so this motion passes unanimously.

**11.1.4. Comment 156, Srini Kandala**

11.1.4.1. SriniK: I move to accept the entry in the "recommended disposition" cell for comment 156 in the document 04/1001r5 as the resolution for the comment. Further instruct the editor to incorporate the suggested change in the recommended disposition into the next TGe draft.

11.1.4.2. JohnF: Is there a second to this motion?

11.1.4.3. DavidH: Second.

11.1.4.4. SriniK: I believe all the commentator was asking for was intended, but did not show up in the text. A renegotiation really is a modification; line 11 already addresses that. I have spoken with the commentator, and he said he'd accept the change from "modify" to "renegotiate".

11.1.4.5. JohnF: Any questions or comments? Hearing none, is there any objection to accepting this motion? I see none, so this motion passes unanimously.

**11.1.5. Comment 180, Srini Kandala**

11.1.5.1. SriniK: I move to accept the entry in the "recommended disposition" cell for comment 180 in the document 04/1001r5 as the resolution for the comment. Further instruct the editor to incorporate the suggested change in the recommended disposition into the next TGe draft.

11.1.5.2. JohnF: Is there a second to this motion?

11.1.5.3. DavidH: Second.

11.1.5.4. SriniK: The commentator's suggestion is rather dangerous, because it would not leave any encoding for this case. So the proposed alternate resolution is to change the text to cover both APSD and EDCA.

11.1.5.5. JohnF: Are there any questions or comments on this? Hearing none, is there any objection to accepting this motion? I see none, so this motion passes unanimously.

**11.1.6. Comment 247, Srini Kandala**

11.1.6.1. SriniK: I move to accept the entry in the "recommended disposition" cell for comment 247 in the document 04/1001r5 as the resolution for the comment. Further instruct the editor to incorporate the suggested change in the recommended disposition into the next TGe draft.

11.1.6.2. JohnF: Is there a second to this motion?

11.1.6.3. DavidH: Second.

- 11.1.6.4. SрниK: I simply did not know what the disposition “accept” means. I propose to delete the sentence.
- 11.1.6.5. MenzoW: Yes, that’s what was intended.
- 11.1.6.6. MarkB: I believe that the sentence is about matching on a TID basis versus AC basis, and is saying you should match on an AC basis.
- 11.1.6.7. SрниK: I believe we should be saying this in a better way. At a minimum someone needs to provide some clarification. In the meantime it is better to remove this confusing statement.
- 11.1.6.8. JohnF: Are there any further questions or comments on this? Hearing none, is there any objection to accepting this motion? I see none, so this motion passes unanimously.

#### **11.1.7. Comment 287, Sрни Kandala**

- 11.1.7.1. SрниK: This is an alternate resolution that Mark came up with yesterday.
- 11.1.7.2. MarkB: Do we really need to be this specific? So we could say “set by the TSPEC”.
- 11.1.7.3. MenzoW: Should be “should”.
- 11.1.7.4. MarkB: Agreed; just say “should use the information in the TSPEC”.
- 11.1.7.5. SрниK: Good, will rewrite to that.
- 11.1.7.6. SрниK: I move to accept the entry in the “recommended disposition” cell for comment 287 in the document 04/1001r5 as the resolution for the comment. Further instruct the editor to incorporate the suggested change in the recommended disposition into the next TGe draft.
- 11.1.7.7. JohnF: Is there a second to this motion?
- 11.1.7.8. DavidH: Second.
- 11.1.7.9. JohnF: Are there any further questions or discussion on this? Hearing none, is there any objection to accepting this motion? I see none, so this motion passes unanimously.

#### **11.1.8. Comment 144 continued, Menzo Wentink**

- 11.1.8.1. MenzoW: I move to adopt the normative changes as contained in Document 11-04-0100-00-000e, section 9.9.3.1.2 (but not section 7.3.2.15) as the recommended disposition for Comment 144.
- 11.1.8.2. DavidH: Second.
- 11.1.8.3. JohnF: Is there any objection to amend the original motion as shown here? Hearing none, the motion is amended, as shown on the screen.
- 11.1.8.4. BobM: I withdraw my objection to the previous version.
- 11.1.8.5. JohnF: Are there any further questions or discussion on this? Hearing none, is there any objection to accepting this motion? I see none, so this motion passes unanimously.

#### **11.1.9. Comment 75, Sрни Kandala**

- 11.1.9.1. SрниK: This now is set to accept the comment.
- 11.1.9.2. SрниK: I move to accept the entry in the “recommended disposition” cell for comment 75 in the document 04/1001r5 as the resolution for the comment. Further instruct the editor to incorporate the suggested change in the recommended disposition into the next TGe draft.
- 11.1.9.3. JohnF: Is there a second to this motion?
- 11.1.9.4. DavidH: Second.
- 11.1.9.5. JohnF: Are there any further questions or discussion on this? Hearing none, is there any objection to accepting this motion? I see one objection, so we need to take this to a vote. This motion is technical and passes with 6:2:1.

**11.1.10. Comment 309, Mathilde Benveniste**

- 11.1.10.1. MathildeB: The proposed resolution now is set to accept the comment.
- 11.1.10.2. MathildeB: I move to reject comment 309. The AP implementer can decide how to implement the buffers.
- 11.1.10.3. JohnF: Is there a second to this motion?
- 11.1.10.4. SriniK: Second.
- 11.1.10.5. JohnF: Are there any questions or discussion on this? Hearing none, is there any objection to accepting this motion? I see no objection, so this motion passes unanimously.
- 11.1.10.6. JohnF: Floyd, you have a total of 45 minutes to cover the 6 comments you have.

**11.1.11. Comment 149, Floyd Simpson**

- 11.1.11.1. FloydS: First we'll describe the trigger issue, comment 149. My motion is presented in the slide titled "Trigger; 11.2.1.4" of this document.
- 11.1.11.2. FloydS: This is the same as I read before.
- 11.1.11.3. MathildeB: I move to divide the motion into two separate motions
- 11.1.11.4. JohnF: Is there a second?
- 11.1.11.5. AmjadS: Second.
- 11.1.11.6. JohnF: Is there any objection to splitting the motion? Hearing none, then Floyd please split the motion into two.
- 11.1.11.7. FloydS: So the first motion now is: I move to modify the text in subclause 11.2.1.4 as stated in Slide 7 of Document 04/0133r2.
- 11.1.11.8. MathildeB: I believe the aggregation bit has to be set to 0 in this case.
- 11.1.11.9. FloydS: I don't believe that to be true. But I can take that out. So I'll amend this to take it out.
- 11.1.11.10. JohnF: Is there a second to this motion?
- 11.1.11.11. SriniK: Second.
- 11.1.11.12. AmjadS: I believe it should be "any of the TSPECs"
- 11.1.11.13. FloydS: I think it should be "each".
- 11.1.11.14. AmjadS: I move to amend to "any".
- 11.1.11.15. JohnF: Is there a second to amend?
- 11.1.11.16. SriniK: Second.
- 11.1.11.17. Menzo: You have already transmitted a trigger frame.
- 11.1.11.18. MathildeB: I speak against the amendment, because the intent of the previous version fixes the problem.
- 11.1.11.19. AmjadS: I think have to understand clearly if the schedule is aggregated or not.
- 11.1.11.20. MenzoW: This is only about unscheduled APSD. It has a trigger frame per TSPEC.
- 11.1.11.21. KeithA: I speak against the amendment. This particular resolution reintroduces the problem, which would force me to vote "No" again.
- 11.1.11.22. JohnF: Is there any objection to this motion? Seeing one, we will vote.
- 11.1.11.23. JohnF: This is a technical motion and fails with 1:8:6.
- 11.1.11.24. JohnF: Are there any more questions or discussion on this motion? Hearing none, is there any objection to accepting this motion? I see no objection, so this motion passes unanimously.
- 11.1.11.25. FloydS: Now to the second Part of the Comment 149 split motion.
- 11.1.11.26. FloydS: So the current motion now is: I move to modify the text in subclause 11.2.1.4 as stated in Slide 7 of Document 04/0133r2.
- 11.1.11.27. JohnF: Is there a second to this motion?
- 11.1.11.28. SriniK: Second.
- 11.1.11.29. MathildeB: I agree with this.



- 11.1.11.30. JohnF: Are there any more questions or discussion on this motion? Hearing none, is there any objection to accepting this motion? I see no objection, so this motion passes unanimously.

**11.1.12. Comment 23, Floyd Simpson**

- 11.1.12.1. FloydS: So this motion now is: I move to incorporate the changes described in Slide 21 of Document 04/0133r2.
- 11.1.12.2. JohnF: Is there a second to this motion?
- 11.1.12.3. SriniK: Second.
- 11.1.12.4. JohnF: Is there any discussion of this motion?
- 11.1.12.5. AmjadS: Is the APSD being requested per TSPEC?
- 11.1.12.6. FloydS: It is per TS.
- 11.1.12.7. AmjadS: So for streams that are not set up, should it be per APSD? So I move to amend the last statement to include "MSDUs belonging to the APSD TS".
- 11.1.12.8. FloydS: This includes management frames, because when you power save everything is buffered (not only the non-APSD).
- 11.1.12.9. BobM: I have a problem with the word "temporarily".
- 11.1.12.10. SriniK: I'm OK with that, since it is used in the base standard. I second the amendment.
- 11.1.12.11. JohnF: Is there any objection to the amendment? Hearing none, this motion now is amended as shown on the screen.
- 11.1.12.12. JohnF: Are there any more questions or discussion on this amended motion? Hearing none, is there any objection to accepting this motion? I see no objection, so this motion passes unanimously.

**11.1.13. Comment 17, Floyd Simpson**

- 11.1.13.1. FloydS: So the Comment 17 motion now is: I move to incorporate the changes described in Slide 18 of Document 04/0133r2.
- 11.1.13.2. JohnF: Is there any discussion of this motion before we second?
- 11.1.13.3. SriniK: All this really is doing is cleaning up the text.
- 11.1.13.4. Richard van Leeuwen (Richard L): It could say it somewhat more clearly.
- 11.1.13.5. JohnF: Is there a second to this motion?
- 11.1.13.6. SriniK: Second.
- 11.1.13.7. JohnF: Are there any more questions or discussion on this motion? Hearing none, is there any objection to accepting this motion? I see no objection, so this motion passes unanimously.

**11.1.14. Comment 18, Floyd Simpson**

- 11.1.14.1. FloydS: So the Comment 18 motion now is: I move to incorporate the changes described in Slides 10, 11 and 12 of Document 04/0133r2.
- 11.1.14.2. JohnF: Is there any friendly discussion of this motion before it is seconded?
- 11.1.14.3. MathildeB: On slide 11, if I have a STA that wants to use scheduled APSD, then that STA is not allowed to use a legacy PowerSave mechanism, because, when it wakes up, it will only receive the frames that are part of TSPECs.
- 11.1.14.4. FloydS: Right.
- 11.1.14.5. MathildeB: That's not acceptable. You need to change the language to be more exact about what you want to do. This is preventing you from using legacy.
- 11.1.14.6. SriniK: I don't think this prevents you from using legacy.
- 11.1.14.7. MathildeB: But this says after the wakeup the AP will only transmit the frames associated with the admitted traffic.
- 11.1.14.8. SriniK: I believe the others are covered elsewhere.
- 11.1.14.9. FloydS: You still are in Power Save mode; the STA just wakes up at a scheduled time.

- 11.1.14.10. JohnF: I have one minute left for this, so is there a friendly amendment?
- 11.1.14.11. JohnF: Hearing none, is there a second to this motion?
- 11.1.14.12. SriniK: Second.
- 11.1.14.13. JohnF: Are there any more questions or discussion on this motion? Hearing none, is there any objection to accepting this motion? I see no objection, so this motion passes unanimously.
- 11.1.14.14. JohnF: Floyd's time has expired. I have a request from Mark to reconsider a motion, but I will put this later on the queue. Mathilde, are you ready now?
- 11.1.14.15. MathildeB: I can make a motion on Comment 8.
- 11.1.14.16. JohnF: In the meantime I'd like Floyd to cover Comment 20.

#### **11.1.15. Comment 20, Floyd Simpson**

- 11.1.15.1. FloydS: I move to incorporate the changes described in Slides 14, 15 and 16 of Document 04/0133r2.
- 11.1.15.2. JohnF: Are there any friendly amendments to this?
- 11.1.15.3. MathildeB: Is your intention to not include any traffic that does not have a TSPEC?
- 11.1.15.4. MenzoW: The question is what you put in the TIM.
- 11.1.15.5. MathildeB: You do not include what has been buffered; we had a very efficient way of clearing the buffer; why do you want to drop that?
- 11.1.15.6. AmjadS: How does the legacy operate here?
- 11.1.15.7. FloydS: No, the QAP would still be able to act as an AP for the legacy traffic.
- 11.1.15.8. MenzoW: The legacy is separated from the TIM, so it is not affecting the TIM.
- 11.1.15.9. MarkB: Legacy is just operating on unadmitted frames; but APSD just operates on admitted frames.
- 11.1.15.10. JohnF: Based on the input, Floyd do you want to change anything in your motion?
- 11.1.15.11. FloydS: No.
- 11.1.15.12. JohnF: Is there a second?
- 11.1.15.13. SriniK: Second.
- 11.1.15.14. MathildeB: I have a problem with this in that I need the TIM to indicate to me what this motion is preventing.
- 11.1.15.15. StephenC: The indication does not give you any specifics about what has been buffered.
- 11.1.15.16. JohnF: I'll give Mark the final comment and we'll take it to a vote.
- 11.1.15.17. MarkB: Status does not exist, so I would be in favor of adding status. Also, you could make the argument that this could be predicted.
- 11.1.15.18. AmjadS: Clarification question: should this be saying "not admitted traffic using APSD".
- 11.1.15.19. FloydS: I disagree. That is the whole issue.
- 11.1.15.20. AmjadS: This clearly excludes the case of unadmitted traffic using APSD.
- 11.1.15.21. SriniK: There's no such traffic.
- 11.1.15.22. AmjadS: TSPEC is not equivalent to admission control.
- 11.1.15.23. JohnF: I'm going to have to cut off debate. So we vote. The vote is technical and loses 9:5:4, for the lack of 75%.

#### **11.1.16. Comment 20, Mathilde Benveniste**

- 11.1.16.1. SriniK: Point of Information: what happens if this motion fails, also?
- 11.1.16.2. JohnF: We can just reject the comment.
- 11.1.16.3. JohnF: I'll give Mathilde 15 minutes because I want to reserve 15 minutes for Comment 75.

- 11.1.16.4. MathildeB: I move to resolve comment 20 with "Comment Declined. This change would deprive us of the possibility to use unscheduled APSD for some important applications."
- 11.1.16.5. JohnF: Is there a second?
- 11.1.16.6. SriniK: Second.
- 11.1.16.7. JohnF: Are there any more questions or discussion on this motion? Hearing none, is there any objection to accepting this motion? I see no objection, so this motion passes unanimously.

#### **11.1.17. Comment 8, Mathilde Benveniste**

- 11.1.17.1. MathildeB: I move to resolve comment 8 with "Comment Accepted. No normative changes needed. Changing the value of the PM bit changes the mode of the station between Active and PS, but the station may be either in the Awake or Doze state while in PS mode. A station using unscheduled APSD that sends a frame with PM bit 1 will remain in the Awake state because, although it is now in PS mode, it must be in the Awake state at the start of a service period. The informative text in 04/0073 clarifies this point."
- 11.1.17.2. MarkB: I'm satisfied with this, and this was my comment.
- 11.1.17.3. FloydS: I would prefer to say "Comment Declined".
- 11.1.17.4. MathildeB: I would leave this wording up to the editor.
- 11.1.17.5. SriniK: I'm OK with the wording on the screen.
- 11.1.17.6. JohnF: Is there a second?
- 11.1.17.7. SriniK: Second.
- 11.1.17.8. JohnF: Are there any more questions or discussion on this motion? Hearing none, is there any objection to accepting this motion? I see no objection, so this motion passes unanimously.

#### **11.1.18. Comment 306, Mathilde Benveniste**

- 11.1.18.1. MathildeB: I move to reject comment 306. The draft is clear on this issue.
- 11.1.18.2. JohnF: Is there a second?
- 11.1.18.3. SriniK: Second.
- 11.1.18.4. JohnF: Are there any questions or discussion on this motion? Hearing none, is there any objection to accepting this motion? I see no objection, so this motion passes unanimously.

#### **11.1.19. Comment 75, Mark Bilstad**

- 11.1.19.1. SriniK: We have two conflicting resolutions of Comment 75. So I move to reject the second resolution.
- 11.1.19.2. MarkB: Comment 75 was asking for CF-ACK for Power Save. The first resolution was to keep the previous usage; then today it was plain to say to accept the comment.
- 11.1.19.3. JohnF: Is there any objection to reconsider the second motion? Hearing none, we will open the discussion again on Comment 75.
- 11.1.19.4. MarkB: I move to resolve comment 75 with the resolution: "Alternate resolution to update Clause 9 to allow for this usage of QoS+CF-Ack in EDCA."
- 11.1.19.5. JohnF: Any further friendly amendments? Hearing none, is there a second?
- 11.1.19.6. SriniK: Second.
- 11.1.19.7. JohnF: Any discussion of this motion?
- 11.1.19.8. AmjadS: What will the editor do in response to this? Will it be optional?
- 11.1.19.9. SriniK: Essentially update the 9.2 tables. It is optional because there is a QACK bit.
- 11.1.19.10. AmjadS: Would it take a lot of time to draft this text?
- 11.1.19.11. SriniK: We don't have time to do this after lunch.

- 11.1.19.12. JohnF: If we accept this resolution, then, Srini, is it clear to you what you have to do?
- 11.1.19.13. SriniK: Yes.
- 11.1.19.14. AmjadS: Point of clarification. We are not creating a mandatory frame?
- 11.1.19.15. SriniK: It is optional on the transmitter side, but mandatory on the receiver side.
- 11.1.19.16. JohnF: Are there any more questions or discussion on this motion? Hearing none, is there any objection to accepting this motion as shown? I see no objection, so this motion passes unanimously.

#### **11.1.20. Comment 69, Mark Bilstad**

- 11.1.20.1. SriniK: With that resolution of Comment 75, then we now have a conflict with the previous resolution of Comment 69.
- 11.1.20.2. MarkB: I move to reconsider the motion to resolve Comment 69.
- 11.1.20.3. SriniK: Second.
- 11.1.20.4. JohnF: Are there any questions or discussion on this motion? Hearing none, is there any objection to accepting this motion as shown? I hear no objection, so this motion to reconsider passes unanimously.
- 11.1.20.5. MarkB: I move to resolve Comment 69 with the disposition "Alternate Resolution. Instruct the editor to update clause 9 to allow for the usage of QoS+CF-Ack in EDCA."
- 11.1.20.6. SriniK: Second.
- 11.1.20.7. JohnF: Are there any more questions or discussion on this motion? Hearing none, is there any objection to accepting this motion as shown? I hear no objection, so this new motion passes unanimously.

## **11.2. Closing**

### **11.2.1. Recess**

- 11.2.1.1. JohnF: We're now out of time and need to continue after lunch.
- 11.2.1.2. The session recessed at 12:31 pm.

## **12. 1:30 pm Thursday, January 15, 2004**

### **12.1. Opening**

#### **12.1.1. Call to order**

- 12.1.1.1. JohnF called the session to order at 1:32 pm.

### **12.2. Comment Resolutions**

- 12.2.1.1. JohnF: We now appear to be ready to complete the comment resolution process. Srini, have we covered all of the comments?
- 12.2.1.2. SriniK: To my knowledge we have successfully resolved all technical comments and the resolutions are in 04/1001r5, which is on the servers.
- 12.2.1.3. JohnF: In the fixed item list Srini will review all of the technical comments, briefly; then we will hold a vote for a recirculation. We already have approval to hold an interim meeting, and we will officially announce it, but hopefully we will not have to actually hold it. Judging from the sentiment and the experience this time, it is unlikely that it will not be needed. I believe we are on the path for continuing to a Sponsor Ballot after this recirculation ballot. Are there any comments on this procedure?

- 12.2.1.4. JohnF: Hearing none, please note that this is the last chance to reconsider any of the current motions or revisit an earlier comment.
- 12.2.1.5. FloydS: Comment 20; we are having some discussions with people who voted against it earlier.
- 12.2.1.6. JohnF: What is the new information that was not considered during the previous discussion?
- 12.2.1.7. FloydS: The objections were relatively minor and we just need to work that out. It almost is editorial in nature.
- 12.2.1.8. MathildeB: I don't see how we can get around that problem.
- 12.2.1.9. JohnF: So we have one for and one against. Srimi, can you show the current resolution for Comment 20 on the screen? If we can line up the facts, I'll ask for a solution.
- 12.2.1.10. JohnF: To reconsider, I need to have a motion from one of the people who voted for this resolution to move to reconsider and another person in that group to second that, and then a 2/3 group needs to vote for that motion to reconsider.
- 12.2.1.11. DavidH: The motion was passed unanimously.
- 12.2.1.12. JohnF: Then anyone can bring up the motion.
- 12.2.1.13. FloydS: I move to reconsider the motion on comment 20.
- 12.2.1.14. JohnF: Is there a second to this motion to reconsider?
- 12.2.1.15. MarkB: Second.
- 12.2.1.16. JohnF: Discussion for and against reconsidering this. What new information is available now? I'm not going to rule on newness if 2/3 of the people here want this to be reconsidered.
- 12.2.1.17. FloydS: I believe that this is motion might create new No votes. In the meantime we have come to some agreements.
- 12.2.1.18. MathildeB: Since this was one of the last comments to be resolved, and we had full knowledge of all of the others, I don't believe there is a basis for reconsideration.
- 12.2.1.19. JohnF: If there is no objection, I would like to call the question. Hearing none, the (2/3) vote is 4:3:7 and the motion fails.
- 12.2.1.20. JohnF: Is there any other business for this session? Or do we come back for the fixed orders at 4pm?
- 12.2.1.21. SrimiK: We need to cover the fixed orders.
- 12.2.1.22. JohnF: I stand corrected; this time we have one fewer session [than we did in the last meeting].

### **12.2.2. Old Business**

- 12.2.2.1. JohnF: The only old business is to officially review the Letter Ballot 63. Since the Ballot closed, two No votes have converted to Yes votes, so now we have only 29 No votes remaining. This gives us 90 percent Yes votes. We received about 240 comments. For the next recirculation ballot vote, please keep in mind that the process still allows you to provide comments, even if you vote Yes on the overall ballot.

### **12.2.3. New Business**

- 12.2.3.1. JohnF: Is there any other Old Business? Hearing none, we go to New Business. From the previous meeting the Working Group gave us authorization to hold an Interim meeting on the week of Feb 16. So here we need to decide what to do. If for some reason things go wrong and we receive more No voters and/or comments, then it probably would be prudent to get together and send out another recirculation. So it is a good idea just to cover some possible, though unlikely, outcomes. I will hold this meeting only if, in my judgment, it is necessary for the overall progress for TGe. Do we have any volunteers to host this meeting?
- 12.2.3.2. AmjadS: If I can confirm, I'll offer New York.

- 12.2.3.3. JohnF: And if Amjad can't confirm his location, I'll offer Florida. Given that, I will formally announce the meeting on the reflector.
- 12.2.3.4. JohnF: Going back to Procedure 10, I'm open to discussion.
- 12.2.3.5. SriniK: I would like to invoke Procedure 10, but I note that in the last meeting we specifically said Draft 6.0.
- 12.2.3.6. JohnF: I'm inclined not to ask for Procedure 10. Stuart and I are asking the ExCom members about this. This time we will present the full package to the group. Srini will be presenting that at the 2:30 fixed item list.
- 12.2.3.7. SriniK: We had one other topic, PAR confirmation.
- 12.2.3.8. JohnF: I have confirmed with Stuart that, since we have not reached the limit, we do not need to confirm the PAR again. In the meantime, note that LB 51 achieved 83% and things have progressed upward since then.
- 12.2.3.9. JohnF: Are there any other comments or issues? Hearing none, we will recess until 2:30pm for the fixed time items.

#### **12.2.4. Recess**

- 12.2.4.1. The TG recessed at 2:08pm until 2:30pm.

#### **12.2.5. Reconvening**

- 12.2.5.1. The TG reconvened at 2:30pm.

#### **12.2.6. Fixed Time Agenda Items**

- 12.2.6.1. JohnF: We're reconvening for the fixed time agenda items. Srini, could you describe the document package?

#### **12.2.7. Letter Ballot Comment Resolution Review**

- 12.2.7.1. SriniK: The comment resolution document is 11-04-1001-06. I am already working on Draft 6.1 and hope to send it to Harry by the end of next week.
- 12.2.7.2. SriniK: I move to accept the entries in the recommended disposition cell in document 04/1001r6 as the group's response to the corresponding LB63 comments and instruct the TGe editor to create Draft 7.0.
- 12.2.7.3. AnilS: Doesn't the creation of the draft need to have to be approved at the WG level?
- 12.2.7.4. JohnF: No it doesn't.
- 12.2.7.5. AnilS: Then I second this.
- 12.2.7.6. JohnF: For the record I would like to a full vote. The motion passes unanimously with 15:0:0.
- 12.2.7.7. SriniK: Document 03/0988r2, TGe Draft Ballot Information, is part of the package. I will update this document after we have votes on the other motions.
- 12.2.7.8. Srini reviewed the contents of 03/0988r2.
- 12.2.7.9. SriniK: Document 03/0989r2, TGe Outstanding No Comments, is on the server. This document is a copy of all of the technical comments that were part of a No vote to LB63. Many of these are accepted, and so would not be part of a No vote today.
- 12.2.7.10. JohnF: Are there any comments, objections, exceptions to what Srini has presented? Hearing none, we will go on to the recirculation motion before coming back to these.
- 12.2.7.11. SriniK: I move to enable the editor to produce 802.11e draft 7.0 based on the comment resolution in 04/1001r6; and authorize a 15-day LB recirculation of 802.11 TGe draft 7.0 to conclude no later than 02/15/2004.
- 12.2.7.12. JohnF: Any questions or discussion of this before we have a second? Hearing none, I'll call for a second.
- 12.2.7.13. Menzo: Second.

- 12.2.7.14. JohnF: Are there any discussions or questions about this full motion? Hearing none, the question is called and we go to a vote. The motion passes unanimously with a vote of 17:0:0.
- 12.2.7.15. JohnF: Now that we have the date, Srinik, can you bring up your overall motion?
- 12.2.7.16. Srinik: Given that vote, I changed the closing date in document 03/0998r2 to include the date we just approved. This is the version of the document that will be published on the server.
- 12.2.7.17. Srinik: I move to approve documents 03/0988r2 and 03/0989r2, along with the Draft 7.0 as the package to be forwarded to ExCom for the purpose of sending the TGe Draft to Sponsor ballot.
- 12.2.7.18. BobM: Second.
- 12.2.7.19. JohnF: Are there any discussions or questions about this motion? Hearing none, the question is called and we go to a vote. The motion again passes unanimously with a vote of 17:0:0.

## **12.3. Meeting Close**

### **12.3.1. Close**

- 12.3.1.1. JohnF: I want to thank everyone for all of your hard work, and especially Floyd, Menzo and Mathilde for this most recent work.
- 12.3.1.2. The TGe January 2004 meeting closed at 2:56 pm.

**IEEE P802.11  
Wireless LANs**

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**TGi Vancouver BC Interim Meeting Minutes  
January 2004**

**Date:** January 12-16, 2003

**Author:** Frank Ciotti  
Apacheta Corporation  
25231 Grogan's Mill Rd.  
Suite 330  
The Woodlands, TX 77380  
Phone: 281-465-4949  
Fax: (413) 556-3532  
e-Mail: fciotti@apacheta.com

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**Abstract**

Minutes of the 802.11 Task Group I meetings held during the 802.11 WLAN Working Group Interim Session in Vancouver, British Columbia, Canada from January 12<sup>th</sup> – 16<sup>th</sup>, 2004.



**Monday, January 12, 2004**

4:00pm

**Call to Order & Agreement on Agenda**

Meeting called to order on Monday, January 12, 2004 at 4:07pm by Chair Dave Halasz.

Secretary: Frank Ciotti

**Agenda discussion - Proposed Agenda:**

- Approve Agenda
- Approve Meeting minutes from Albuquerque (03/873)
- Review IP policy & Letters received
- Chairs status
  - Sponsor Ballot results
- 802.11i EAP Method Requirements (Monday & Thursday): Dorothy Stanley
- Security Standing Committee – Clint Chaplin
- Action management frames 03/992 – Mike Moreton
- TGi Motions 03/996: Mike Moreton
- Submissions & Motions for SB resolution
- Review comments and divide comments into sub-groups
- Ad-hoc to resolve comments, return for motions
- Prepare for next meeting

Chair: Any Objection to approving the agenda?

None

Agenda Approved

**Meeting minutes approval**

Chair: Any objection to approving the Meeting Minutes from Albuquerque?

None

**Minutes Approved**

**Review IP Policy**

Two slides requested by WG chair “IEEE-SA Standards Board Bylaws on Patents in Standards” and “Inappropriate Topics for IEEE WG Meetings” were shown and read by Chair.

Any objections regarding IP Policy are to be made to either the WG or TG chairs.

Chair: Does anybody have a patent they wish to disclose?

No.

**Chair’s Status**

Chair: We went to SB which closed on Dec 20<sup>th</sup>. There were 163 voters in the pool. 117 yes, 15 no. 85% returned. Doc 04/1004 contains the comments. There were 712 comments.

### **802.11i EAP Method Requirements – Dorothy Stanley – doc 04/065**

Dorothy: The IETF response to the original 802.11 March 2003 letter is documented in this document. IETF recommends that IEEE place the EAP requirements into an RFC so that they can be referenced by IETF. The task is to map the 802.11 requirements language from our document to an IETF RFC language per the RFC 2284bis format.

Comment: A man-in-the-middle attack is really a general term that can mean one of several types of attacks.

Dorothy: I would like people to review this draft, and then we will vote on it on Thursday. And then submit as an RFC to the IETF.

Chair: Did you want to schedule time for an ad-hoc?

Dorothy: There is really no good time in our schedule before Thursday afternoon.

### **Security Standing Committee - Clint Chaplin – doc 04/008r3**

Clint: Suggest the creation of a Security Standing Committee. This committee would address the issue of how we maintain security going forward. This group would act as an advisor to other groups. You don't need to be a voting member to participate in a Standing Committee which means that we could use outside resources.

Comment: Things that happen in other groups can affect 802.11 security (e.g. 802.1af). How will this be addressed? Are other groups going to follow this, or have their own security groups?

Cl: I can't say at this point. I would like to try.

Comment: I support this concept. Where it lives and how it relates to other groups is relevant. This should attract more security experts to participate and review.

Cl: Should we start with just a 802.11 security group, and then grow to all of 802? Or start with all of 802?

Comment: If Stuart approves this, what will be the power of the SC be within 802.11?

Cl: We don't have the power to make standards.

Comment: this seems analogous to the maintenance group becoming a Task Group (TGm).

Comment: The maintenance committee has identified large wholes in the 802.11 standard, that if fixed would change the operation.

Comment: I feel that it is very important to have security liaisons not only to the TGs and WGs, but to the IETF and other standard organizations as well.

Cl: Many of the outside groups will not trust the advise of experts outside their groups.

Comment: There is a scope issue. Our 4-way handshake is dependent upon other standards outside 802.11 (802.1 and IETF). We need to monitor changes to these external dependencies.

Comment: You would like this SC to interact early on in any new TG or WG. We may want to mandate that an item for the PAR is security requirements. This would force new work to consult the SC early on.

Comment: You may want to open liaisons with groups with whom we have dependencies. This should be brought up at an 802 Plenary and presented as something that affects everyone.

Comment: There is an interest within 3gpp to have a mtg with the IEEE regarding security.

Cl: I will be presenting this to WNG tomorrow at 10:30.

### **Submission: Mike Moreton - Encrypted Action Frames – doc 03/992**

Mike: This is not an attempt to encrypt all management frames, but rather to put hooks in place for others to use. Many other groups would like Action Frames to be authenticated and/or encrypted. 802.11i does not use Action Frames, so we haven't bothered to address them.

Mike: This idea is to create a new Encrypted Action Frame type, rather than change drafts to encrypt the existing Action Frame type.

Comment: Why different types for Encrypted Vs. Non-Encrypted. Seems unnecessary when there is an encrypted bit.

Mike: This was to avoid issues with existing AF implementations.

Comment: What replay counter space?

Comment: The use of Encrypted AF should be negotiated during the Assoc, and then if Encrypted is selected, then non-encrypted AF should be dropped.

Mike: I agree, but I did not want to break existing implementations. This would only encrypt, not authenticate existing implementations.

Comment: Since you are using CCMP, integrity is there. But its use must be mandated.

Mike: agree.

Comment: is there any requirement to negotiate a key hierarchy for management Vs. data frames?

Mike: my idea would be that there wouldn't be. Simply a different replay counter.

Comment: if there are multiple priority queues, how do those two uses of replay counters interact?

Mike: That shouldn't be an issue as long as separate replay counters are used.

Chair: it may be dangerous to specify how TGk should operate. By us specifying behavior, we may actually hurt some future TG.

Comment: Are you going to mandate that the receiver accept both encrypted and non-encrypted Action Frames?

Mike: that already exists. This by itself won't protect things. It is a toolkit.

Comment: First, if you have sequence number collision, then you have the same problem as WEP. Second, we are just out of SB, and this looks like new functionality. So the only way to add this is to address a SB comment.

Mike: yes, I made a comment on this.

Comment: Things seem to warrant a separate PAR.

Mike: This should be treated like data frames, where there is a replay counter based on a sequence number.

Mike: I am not going to make a motion on this at this point based on the multicast comment.

Comment: TGk is voting on a similar motion this week.

Mike: Will this address TGk's issues?

#### **Submission: Mike Moreton – TGi Motions – doc 03/996**

Discussion on RSNACapable

Comment: If you clean-up the use of the term RSNACapable, you should also clean-up the term RSNAEquipment.

#### **Motion by Mike Moreton**

*It is the intention of TGi, that the term "RSNACapable" should only imply that the device is capable of establishing an RSNA, not that it is configured to do so. Dot11RSNAEnabled shall be set to true when RSNA is actually enabled, and hence is a far more common determinant of RSNA type behaviour than RSNACapable.*

Second: Dave Nelson

Discussion:

None

**Vote: 25-0-4 Passes**

Discussion on Using 802.1X AKMP to get a WEP Key

Comment: There is already a capability bit. Are you proposing to move this?

Mike: I'm not suggesting that we make any changes to the draft at this time, simply stating a rule for usage that can be applied to future changes.

**Motion by Mike Moreton**

*It is the intention of TGi, that the combination of Group Key Cipher Suite = WEP, and Pairwise Key Cipher Suite = Use Group Key should not be allowed.*

Second: Dorothy Stanley

Discussion:

None

**Vote: 13-3-5 Passes**

**Discussion on IBSS Policy**

Comment: This does not represent TGi's intention, although I am in favor of it. I've been arguing about this one for a long time and TGi has never accepted it.

Comment: TGi's opinion does change over time.

Chair: There are other aspects of IBSS that do not function properly without a uniform security policy.

Comment: what is a uniform security policy?

Mike: EAP methods are outside our scope. If all parties support both TKIP and CCMP, why have both in the list since CCMP will always be chosen?

**Motion by Mike Moreton**

*The intention of TGi is that IBSS support should be based on the concept of a uniform security policy for all members of the BSS. A uniform security policy shall include a single pairwise encryption suite, and a single AKMP.*

Second: Dave Nelson

Discussion:

None:

**Vote: 9-9-7 Fails**

**Discussion on Deleting an RSNA**

Comment: the point at which you want to remove the state is the point at which you require a new 4-way handshake.

Comment: The motions to state the intent of the TG seem pointless. Who will do the actual work?

Comment: These motions are not pointless, as they need to be discussed prior to the comment resolution. These topics affect several of the sub-groups, and we need to have a common intent across all sub-groups to maintain uniformity.

Mike: I agree that Straw Polls seem more appropriate, but procedurally, you can't debate Straw Polls.

Chair: We can resume this discussion after the dinner break.

**Recessed at 6:00pm until 7:30pm**

Resumed at 7:45pm

Chair: We left off with the discussion of Mike Moreton's document 03/996. Mike and I were talking about this, and decided that it would be better to present the entries in the document as Straw Polls instead of Motions.

**Discussion on MAC Signaling of a New STA in an IBSS**

The current draft describes two ways for informing the SME that a new station is attempting to talk to you in IBSS. The intent here is to provide only a single mechanism – that is the MLME-AUTHENTICATE.indication which will be generated by either receipt of an Authenticate frame, or receipt of a data frame that could not be decrypted.

Straw Poll by Mike Moreton

*TGi should adopt the MLME- AUTHENTICATE.indication mechanism for signalling new STAs in an IBSS, and remove the MLME-PROTECTEDFRAMEDROPPED.indication mechanism for signalling new STAs in an IBSS.*

Result: 5-0-8

**Discussion on Local Multicast**

Comment: This one should be a motion and not a straw poll

Comment: Is this a motion to do nothing?

Mike: yes, but our intent should be clear.

**Motion by MikeMoreton**

*It is the policy of TGe not to include protection of TGe's "Local Multicast" feature.*

Second: Jon Edney

Discussion:

None

Vote: 14-0-6 Passes

Revisit of IBBS issue

**Straw Poll by Mike Moreton**

*IBSS support should be based on the concept of a uniform security policy for all members of the IBSS. A uniform security policy shall include a single pairwise encryption suite, and a single AKMP.*

Result: 16-0-3

Comment: what takes precedence, the motion or the straw poll?

Mike: the motion failed, so it has no consequence. The intention of the group was not stated.

**Discussion on MAC Authentication in an IBSS**

Comment: if there are few or no implementations of this, then who cares?

Mike: I just want to reduce the complexity

Comment: It may help those that are planning on implementing IBSS. I heard that Microsoft is implementing IBSS.

Comment: A lot of the complexity is there because IBSS is not a well defined concept that you can build systems on. It is a huge waste of all of our time to be discussing IBSS. It should be removed or TGi should fix it to be useful.

Comment: IBSS is not required for WPA certification. Is it required for WPA2? If not, then kill it.

**Straw Poll by Mike Moreton**

*TSN should not be supported in an IBSS, and hence the optional MAC authentication stage is of no value, and should be removed.*

Result: 5-0-14

**Discussion on MAC Authentication in an ESS**

Comment: Some customers will expect the MAC authentication will be there.

Mike: I suggest that it be made optional as it is in IBSS.

Chair: Does this actually address the Comments?

Mike: yes

Comment: it is too late to do this. I believe this was voted on in the Florida meeting, but decided leave in for WPA.

**Straw Poll my Mike Moreton**

*Remove the MAC Authentication stage when establishing an RSNA in an ESS*

Result: 1-11-5

**Discussion on IBSS 4-way Handshakes**

Comment: one still has to solve the problem of two STAs Associating simultaneously.

Comment: the problem is not in 802.1X. This is the description of the PAR for 802.1af.

Comment: Allowing peers to authenticate is the key goal of 802.1af.

Chair: This would simplify things, but you would still end up with 6 or 8 packets.

Comment: If this problem is being resolved by another group's PAR, why are we defining this in TGt?

Comment: 802.1af is moving away from the Supplicant & Authenticator model to accommodate peer to peer authentication.

Comment: I would argue that having two 4-way handshakes is not complex because you can re-use code.

**Straw Poll by Mike Moreton**

*TGt should move to a single 4-way handshake for IBSS.*

Result: 3-9-6

**Submissions & Motions for SB resolution**

Chair: Are there any motions or submission addressing SB Comments?

None

**Review SB Comments and Break into Subgroups**

Chair: Draft 7.1 is on the server in the "pre 500" area.

Chair: I am looking for volunteers to help lead the subgroups.

POI: There were about 5 comments that were labeled as Editorial, and they should be labeled as Technical because they require changes to normative text. How should we address these?

Chair: Leave them as Editorial, since they all need to be addressed anyway.

**SB Comment Sub-groups:**

Sub-group lead(s)	Clause(s)
Dave Halasz, Frank Ciotti	2, 3, 4, 7
Jesse Walker	5, 8.3.2
Dave Nelson	8, 8.1, 8.2
Dorothy Stanley	8.5, 8.6
Paul Lambert	8.3.3, Annex I

Chair: Any objection to recessing until tomorrow at 1:30pm?

None

Recessed until 1:30pm tomorrow.

**Tuesday, January 13, 2004**

Resumed at 1:30pm

Chair: Are there any comment resolution motions to be made at this time?

None

Chair: Draft 7.1 is available on the server

Comment: what is in draft 7.1?

Comment: Draft 7.1 addresses most of the editorial comments on the SB.

Comment: Were most of the editorial comments in the spreadsheet (03/1004) already addressed?

Comment: yes

Comment: A number of technical comments are listed "addressed". And some of the resolution text does not match the description.

Chair: we need to review why this appears to be corrupted. We should hold off on adopting draft 7.1

**Revised SB Comment Sub-groups:**

<b>Sub-group lead(s)</b>	<b>Clause(s)</b>
Dave Halasz, Frank Ciotti	2, 3, 4, 7
Jesse Walker	5, 8.3.2
Dave Nelson	8, 8.1, 8.2, 8.3.1
Dorothy Stanley	8.4, 8.5
Paul Lambert	8.3.3, Annex I

**Editor's Report from this morning's Editors meeting – Jesse Walker**

Jesse: There is a concern that since the draft has to be sent to the IEEE as a Frame document, if we wait too long to convert the draft to Frame, the draft voted on in Sponsor Ballot is not the one being submitted to RevComm.

Jesse: The Operating Rules only state that the draft be made available to the members in PDF. The editors voted to use Frame for all draft going forward.

Jesse: I do not plan on maintaining a Word version of the draft once I convert it to draft.

Chair: There is an issue with copying pictures and tables from PDF. One won't be able to modify the pictures.

Jesse: We should definitely do this before completing Sponsor Ballot.

Chair: Any further topics before we break into the ad-hoc session?

none

Chair: Any objection to working in an ad-hoc until Wednesday at 8:00am?

None

**Wednesday, January 14, 2004**



8:00AM - Resume

Chair: I would like to discuss the issue going to Re-circulation by the end of this week. My opinion is that it does not look likely that we will make it.

Chair: Does anyone have another opinion?

None

Chair: I don't believe you need 30 days notice to go to recirculation. However, you do need 30 days notice to schedule a TG meeting to resolve comments. I will discuss with Stuart and others to clarify this. We could schedule a meeting and go to recirculation before the March meeting. I would like people to think about this. We can bring this up again Thursday night.

Chair: are there Comment Resolution motions that people would like to make?

Yes – Jesse doc 04/103

Jesse: I used the row number from the spreadsheet to indicate the comment number in the motions rather than the index number in column A.

**Motion by Jesse Walker**

*Motion: IEEE 802.11 Task Group I adopts 802\_11i-D7.1.doc as the basis for further work*

Second: Dorothy Stanley

Discussion:

Comment: we should use 7.1 for comment resolution from this point forward?

Jesse: yes

Vote: 19-0-2 Passes

**Motion by Jesse Walker**

*Address Comment 301 on 5.1.1.4 by adopting the text:*

“In an RSNA, IEEE 802.11 provides functions to protect Data frames, IEEE 802.1X provides authentication and a controlled port, and IEEE 802.11 and IEEE 802.1X collaborate to provide key management”

Second: Dave Nelson

Discussion:

None

Any objection?

None

Motion Passes

**Motion by Jesse Walker**

Address Comment 295 on 5.2.2.2 with the following text:

The first component is an IEEE 802.1X Port Access Entity (PAE). PAEs are present on all STAs in an RSNA and control the forwarding of data to and from the MAC. An AP always implements an Authenticator PAE and implements the EAP Authenticator role, and a STA always implements a Supplicant PAE and implements the EAP Peer role. In an IBSS, each STA implements both an Authenticator PAE and a Supplicant PAE, and both the EAP Authenticator and Peer roles.

Second: Dorothy Stanley

Discussion:

Comment: This is just one example of where terminology is not consistent with 802.1X. If we change this here, we may be inconsistent with the use of these terms elsewhere in the draft.

Jesse: A valid concern, but we are trying to make the document correct.

Vote: 19-1-1 Passes

**Motion by Jesse Walker**

*Address Comments 287, 288 by replacing the text from 5.4.2.2*

“Once the IEEE 802.1X AKM completes successfully, the IEEE 802.1X Controlled Port unblocks to allow data traffic”

*with the text:*

“Once the AKM completes successfully, data protection is enabled to prevent unauthorized access, and the IEEE 802.1X Controlled Port unblocks to allow protected Data traffic.”

Second: Al Potter

Discussion:

None

Any objection?

None

**Motion Passes**

**Motion by Jesse Walker**

*Address Comment 298 by replacing the text from 5.4.2.3 with:*

“No facilities are provided to move an RSNA during Reassociation, so the old RSNA will be deleted, and a new RSNA will need to be constructed”

Second: Frank Ciotti

Discussion:

None

Any objection?

None

Motion Passes

**Motion by Jesse Walker**

*Address Comment 299 by replacing 1st paragraph we are adding with:*

In a WLAN that does not support the establishment of RSNAs, Authentication and Confidentiality services were defined with the intention of providing similar security characteristics to those achieved by restricting physical access to a wired LAN. A wired LAN provides a level of Authentication as only users with physical access to the LAN can connect, and a level of Confidentiality as only users with physical access can monitor data flows

Second: Mike Moreton

Discussion:

Comment: The comment attempts to reflect the intent of WEP at the time.

Comment: With enough resources, signals can be retrieved from a wire without physical access. This simply attempts to describe the original intent of 802.11 with WEP.

Comment: So WEP was an attempt to provide the same level of security as that provided by a wire.

Comment: The second sentence is where the contention is. Insertion of the phrase “very low” before “level” is more accurate.

Comment: We should use the term “protection” rather than security terms.

**Motion to amend by Russ Housley**

*Address Comment 299 by replacing 1st paragraph we are adding with:*

In a WLAN that does not support the establishment of RSNAs, WEP protection intended to provide similar security characteristics to those achieved on a physically protected wired LAN.

Second: Thomas Maufer

Any objection?

Yes

Discussion:

Comment: we have not indicated where this is to be inserted in the draft.

Call the question

Any objection?

None

Question called

Vote on motion to amend: 10-1-4 Passes

Main Motion

Discussion:

Jesse: against: this motion needs more work in order for it to meet the demands of the comment

Motion to table the motion by Mike Moreton

Vote: 10-2-1 Passes

Motion tabled

Jesse: I encourage people to review the text in Motion 7 of doc 04/103 as it replaces the text in clause 5.4.3.1.

Jesse: there was an editorial comment that the draft should make amendments to the 2003 re-affirmation rather than the 1999 spec.

Chair: is this the roll-up?

Jesse: yes. There are significant changes

**Motion by Dorothy Stanley - Comment 120: Accept**

*Clause 8.4.10.1*

*Change "lose" to "loses" in:*

In an RSNA, STAs generally transfer only protected data MPDUs. If a STA loses key state synchronization, in order to recover,

*And Change List item 3 from*

If the STA is RSNA Capable and has joined an ESS, the SME shall execute the deauthentication procedures as described in Clause 11.3.3 except when the RSN security association is initiated to when MLME-SETPROTECTION.request primitive has been invoked.

*To*

If the STA is RSNA Capable and has joined an ESS, the SME shall execute the deauthentication procedures as described in Clause 11.3.3. However, if the STA has initiated the RSN security association, but not yet invoked the MLME-SETPROTECTION.request primitive, then no additional action is required.

Second: Jesse Walker

Discussion:

None

Any objection?

None

Motion Passes

**Motion by Dorothy Stanley - Comment 198: Accept**

*Delete the following informative note in clause 8.4.1.1*

Informative Note: The Supplicant typically does not have a lifetime for this security association. In this case zero is used to represent no timeout.

Second: Jesse Walker

Discussion:

None

Any objection?

None

Motion passes

**Motion by Dorothy Stanley - Comment 199: Accept**

*In Clause 8.4.6.1 Third paragraph, change*

"MAC address is the BSSID"

*to*

"MAC address shall be the BSSID"

Second: Mike Moreton

Discussion:

Comment: it may be possible for the STA to learn the wired MAC addr of the remote AP, which may not be the same as the BSSID.

Comment: if an AP receives a frame on the wired interface with a destination MAC address of the WLAN interface (BSSID), the AP may drop it.

Comment: AP's that support pre-authentication, must not drop frames of this type.

Vote: 16-0-1 Passes

**Motion by Dorothy Stanley – Comments 215, 519: Accept**

*In Clause 8.4.10.1, change*

STAs receive IEEE 802.1X messages in unprotected data MPDUs destined for the IEEE 802.1X Authenticator's Uncontrolled Port when the STA does not have a PTK available, configured and MLME-SETPROTECTION.request primitive has not been called.

*To*

STAs receive IEEE 802.1X messages in unprotected data MPDUs destined for the IEEE 802.1X Authenticator's Uncontrolled Port when the MLME-SETPROTECTION.request primitive has not been called.

Second: Mike Moreton

Discussion:

None

Any objection?

None

Motion passes

**Motion by Dorothy Stanley – Comment: 248**

*In Clause 8.4.9, change*

A STA's IEEE 802.1X implementation shall check that the Group cipher suite and AKMP (See Clause 8.4.4) matches that in Beacons and Probe Responses received for the IBSS and for the STA not to set up a security association with any STAs with an inconsistent security policy. The Beacons and Probe Responses of the various STAs within an IBSS are required to reflect a consistent security policy, as the Beacon initiation rotates among the STAs. The methods used to achieve reconciliation of these policy issues across multiple STAs are outside the scope of this standard.

*To*

A STA joining an IBSS is required to adopt the security configuration of the IBSS, which includes the Group cipher suite, unicast cipher suite and AKMP (See Clause 8.4.4). The STA shall not set up a security association with any STA having a different security configuration. The Beacons and Probe Responses of the various STAs within an IBSS must reflect a consistent security policy, as the Beacon initiation rotates among the STAs.

Second: Mike Moreton

Discussion:

None

Vote: 13-0-5 Passes

**Motion by Dorothy Stanley – Comment 196: Accept**

*In Clause 8.4.5, First paragraph, remove the following two sentences:*

It is expected that most other protocol exchanges will make use of the IEEE 802.1X Controlled Ports. However, a given protocol may need to bypass the authorization function and make use of the IEEE 802.1X Uncontrolled Port.

Second: Jesse Walker

Discussion:

None

Any objection?

None

Motion passes

**Motion by Dorothy Stanley – Comment 197: Accept**

*In Clause 8.4.6 First paragraph, change*

When IEEE 802.1X authentication is an authentication option, an RSNA-capable STA shall use IEEE 802.11 Open System authentication prior to (re)association.

*To*

When establishing an RSNA, a STA shall use IEEE 802.11 Open System authentication prior to (re)association.

Second: Mike Moreton

Discussion:

None

Any objection?

None

Motion passes

Discussion on reconsider for comment 196 motion

Comment: the intent here was to provide a mechanism for Hotspot providers to allow new subscribers to enroll.

Motion to reconsider by Dave Nelson

Second: none

#### **Discussion on Comment 200**

Comment: The scenario is the STA is associated to AP1, and begins pre-authentication to AP2 via the DS. The STA then re-associates to AP2 and continues the pre-authentication via the wireless medium. Since these frames are not the EAPOL Ethertype they are pre-authentication Ethertype), should AP2 discard them?

Comment: The original pre-authentication via the wired medium should be aborted.

Comment: AP2 should discard the pre-authentication frames received via the WLAN.

Comment: The STA should also know that it is now associated to AP2 and therefore should not be sending pre-authentication frames to it and switch EAPOL frames.

Recessed at 10:00am until 1:30pm

Resumed at 1:37pm

Chair: Revision 5 of the comment spreadsheet is available. After adopting draft 7.1, there are 382 remaining comments.

Resuming with Dorothy Stanley's comment resolution motions. The document is on the server as 04/124.

#### **Discussion on Comment 198:**

Comment: The AP must advertise its support for pre-authentication in the RSN IE. So the STA should know if new AP supports it.

Dorothy: The draft states that the new AP need not be in radio range.

Comment: The STA could be aware of the new AP via mechanisms other than Beacons (e.g. 802.11k, GPS, etc.).

Comment: Approving this would allow STAs to attempt to Associate to AP without knowing its security parameters.

Dorothy: Do you need to know that the new AP supports pre-authentication?

Comment: yes

Dorothy: So there needs to be a mechanism for the STA to obtain this parameter other than the Beacon if the STA is out of radio range of the new AP.

Comment: What happens in the case where the STA is pre-authenticating to a new AP, but the STA does not like some part of the pre-authentication? And then the STA Associates to the new AP?

**Motion by Dorothy Stanley – Comment 203**

*In Clause 8.4.10.1, delete the subsection heading and first sentence, and change:*

8.4.10.1 Illegal data transfer

In an RSNA, STAs generally transfer only protected data MPDUs. If a STA lose key state synchronization, in order to recover, the following rules apply:

*To:*

If a STA loses key state synchronization, in order to recover, the following rules apply:

Second: Fred Stivers

Discussion:

Comment: is the part that is being deleted duplicated elsewhere, or was it deemed incorrect?

Dorothy: Changes adopted earlier may have addressed this.

Vote: 17-0-1 Passes

**Motion by Dorothy Stanley – Comment 395: Accept**

*In Clause 8.4.10.1, delete the following sentences:*

IEEE 802.1X messages except for Pre-authentication messages, are never forwarded to or from the DS. Pre-authentication messages shall not be accepted by the IEEE 802.1X Uncontrolled Port, i.e. they shall only be forwarded to and from the DS when protected.

Informative Note: STAs may optionally receive frames other than IEEE 802.1X messages in unprotected data MPDUs destined for the IEEE 802.1X Authenticator's Uncontrolled Port at any time, with the caveat that any protocol utilizing this mechanism should provide cryptographic data protection mechanisms, suitable for the intended application or usage, within the protocol itself. These frames are never forwarded to or from the DS, but terminate at an application level service, such as a captive portal, on the AP. This usage is outside the scope of this standard.

Second: Dan Harkins

Discussion:

None

Any objection?

None

Motion passes



**Motion by Dorothy Stanley** – Comment 378, 416; Accept

*In Clause 8.4.1.1, add the following to the list of elements in the PMKSA:*

- AKMP
- Pairwise Ciphersuite selector, established during the initial 4-Way Handshake.
- Group ciphersuite selector, established during the initial 4-Way Handshake.

Second: Nancy Cam-Winget

Discussion:

POI: why is the Group Key ciphersuite selector added?

Dorothy: the text indicates that the Group Key ciphersuite is part of the cached PMKSA

Comment: Maybe the cached PMK text should be modified instead. Remove the reference to ciphersuites being part of the SA from Clause 8.4.6.2 as they are not known at the time of pre-authentication.

Comment: After pre-authentication with the AS, a vendor specific attribute may be used to establish a cipher suite prior to Association with the new AP.

Comment: The authorization parameters indicate what you are authorized to do. They are not used to negotiate a cipher-suite.

Comment: AAA can't change the cipher-suite selector, however the 4-way handshake may.

Dorothy: is the AKMP part of the PMKSA?

Comment: yes

**Motion to amend by Dan Harkins**

*In Clause 8.4.1.1, add the following to the list of elements in the PMKSA:*

- AKMP

*In Clause 8.4.6.2, change the sentence:*

The PMKSA cannot be changed while cached e.g. the Pairwise cipher, Group cipher, AKMP and authorization parameters cannot be changed.

*To:*

The PMKSA cannot be changed while cached.

Second: Dave Nelson

Discussion:

None

Vote: 19-0-0 Passes

Discussion on main motion:

None

Any objection to the main motion?

None

Main motion passes

**Motion by Dorothy Stanley – Comment 412: Accept**

*In Clause 8.4.1.1, end of second paragraph, change the sentence:*

"An RSN STA has 4 security associations"

*to:*

"There are four types of security associations supported by an RSN STA:"

Second: Dave Nelson

Discussion:

None

Any objection?

None

Motion Passes

**Motion by Dorothy Stanley – Comment 413: Accept**

*In Clause 8.4.1.1, STAKKeySA – change:*

There shall be only one STAKKeySA with the same Initiator and Peer MAC addresses.

*To:*

There shall be only one STAKKeySA with the same Initiator and Peer MAC addresses. Creation of a new STAKKeySA with the same Initiator and Peer MAC addresses will cause deletion of the existing STAKKeySA.

Second: Jon Edney

Discussion:

None

Any objection?

None

Motion passes

**Motion by Dorothy Stanley – Comment 358: Accept**

*In Clause 8.4.1.2, first informative note in list item 3, change:*

The IEEE 802.1X Controlled Port returns to the unauthorized state and blocks all Data frames upon completion of an MLME-DELETEKEYS.request primitive.

*To:*

The IEEE 802.1X Controlled Port returns to the unauthorized state and blocks all Data frames before invocation of an MLME-DELETEKEYS.request primitive.

Second: Fred Haisch

Discussion:

None

Any objection?

None

Motion passes

**Motion by Dorothy Stanley – Comment 359:Accept**

*In Clause 8.4.1.2, second set of list items, in second bullet, change:*

The Authenticator shall perform another IEEE 802.1X authentication if it does not have a cached PMKSA for at least one of the supplied PMKIDs.

*To:*

If none of the cached PMKSA's match any of the supplied PMKIDs, then the Authenticator shall perform another IEEE 802.1X authentication.

Second: Mike Moreton

Discussion:

Comment: the PMKSA contains more than just the PMKID, so match is the wrong word.

**Motion to amend by Dan Harkin**

*In Clause 8.4.1.2, second set of list items, in second bullet, change:*

The Authenticator shall perform another IEEE 802.1X authentication if it does not have a cached PMKSA for at least one of the supplied PMKIDs.

*To:*

If none of the PMKIDs of the cached PMKSA's match any of the supplied PMKIDs, then the Authenticator shall perform another IEEE 802.1X authentication.

Second Dave Nelson

Discussion:

None

Any objection?

None

Motion to amend passes

New main motion

Discussion:

Any objection?

None

Main Motion passes

**Motion by Dorothy Stanley – Comment 360: Accept**

*In Clause 8.4.1.2, second to the last paragraph, change:*

The life cycle of a security association is different in an IBSS. When an IBSS STA's SME wants to setup a security association with a peer STA, it must first obtain the peer's security policy using Probe Request if necessary. It then creates an IEEE 802.1X Supplicant and Authenticator port for the peer. When IEEE 802.1X authentication is not used, a STA's Supplicant sets the IEEE 802.1X authSuccess and portValid variables to TRUE so the 4-Way Handshake of Clause 8.5 (using Pre-Shared Key (PSK)) is used with each IBSS peer STA it encounters.

*To:*

In an IBSS, when a STA's SME establishes a security association with a peer STA, it creates both an IEEE 802.1X Supplicant and Authenticator for the peer.

Second: Dan Harkins

Discussion:

Comment: Does this address comment 361 as well?

Dorothy: yes

Any objection?

None

Motion Passes

Any objection to a five minute recess?

None

Recessed for five minutes

Resume

**Motion by Dorothy Stanley – Comment 362:Accept**

*In Clause 8.4.1.2, change the two informative notes at the end of the section from:*

Informative Note: A STA can receive IEEE 802.1X messages from a previously unknown MAC address. Membership in the IBSS is determined by the peer STA's knowledge of the correct PSK.

Informative Note: Any STA within an IBSS may decline to form a security association with a STA joining the IBSS. An attempt to form a security association may also fail because, e.g., the peer uses a different Pre-Shared Key from that which the STA expects.

*To:*

A STA can receive IEEE 802.1X messages from a previously unknown MAC address.

Any STA within an IBSS may decline to form a security association with a STA joining the IBSS. An attempt to form a security association may also fail because, e.g., the peer uses a different Pre-Shared Key from that which the STA expects.

Second: Clint Chaplin

Discussion:

None

**Vote: 13-0-0 Passes**

**Discussion on Comments 414,415:**

Comment: The STA may obtain the SSID of the AP via mechanisms other than beacons

Comment: since the STA must indicate the SSID in the Association Request, is this superfluous?

Dorothy: the STA may not actually know the SSID and may be fishing.

Comment: Was the comment objection to associating to unknown APs, or to assert that AP vendors that conceal the SSID are non-conformant?

Chair: is suppressing the SSID considered a secure solution?

Comment: not any longer.

Comment: In fact, concealing the SSID reduces security. It is the client's identifier for which credentials to present.

Comment: I don't see the security value in an SSID. Anyone can use whatever SSID they wish. It is not included in exchanges.

Comment: An analogy is MAC address filtering. MAC address spoofing is easily accomplished.

Dorothy: it is an unprotected identifier, but still an identifier. It allows the client to present less of its credentials than it would otherwise.

Comment: If an AP does not advertise its SSID, but the STA does know it, the STA is permitted to Associate to it.

Recessed until 4:00pm

**Motion by Dorothy Stanley – Comment 486:Accept**

*In Clause 8.4.1.2, first list item of the second list, change:*

(Re)Associating followed by IEEE 802.1X authentication

*to:*

(Re)Associating followed by IEEE 802.1X **or PSK** authentication

Second: Jon Edney

Discussion:

None

Any objection?

None

Motion passes

**Motion by Dorothy Stanley – Comment 594:Accept**

*In Clause 8.1.4, list item 7, change:*

The STA's Supplicant and the AS generate a different fresh common key for each <STA, AP> pair, and a different key for each session between the pair. This assumption is fundamental, as reuse of any symmetric key would enable compromise of all the data protected by that key.

*To:*

The STA's Supplicant and the AS generate a different fresh common PMK for each <STA, AP> pair. The STA's Supplicant and the Authenticator generate a different, fresh PTK for each session between the pair. This assumption is fundamental, as reuse of any PTK would enable compromise of all the data protected by that key.

*and, in Clause 8.4.6.2, change:*

The PMK in the PMKSA **can be used** with the 4-Way Handshake to establish **new** PTKs.

*To:*

The PMK in the PMKSA **is** used with the 4-Way Handshake to establish **fresh** PTKs.

Second: Jesse Walker

Discussion:

None

Any objection?

None

Motion passes

Dorothy will revisit Comments 414 & 415 later.

#### **Motion by Dave Nelson**

*To resolve SB comment number 343, in Clause 8.1, replace the Informative Note:*

Informative Note: This document does not prohibit STAs from simultaneously operating pre-RSNA and RSNA algorithms, but does not define how to accomplish simultaneous operation. Clause 8.4 discusses some aspects of mixing RSNA and pre-RSNA STAs.

*With the following:*

Informative Note: This document does not prohibit STAs from simultaneously operating pre-RSNA and RSNA algorithms.

Second: Dorothy Stanley

Discussion:

None

Any objection?

None

Motion passes

#### **Motion by Dave Nelson**

*To resolve SB comment number 355, in Clause 8.3, delete the first two sentences in this clause.*

Second: Jesse Walker

Discussion:

None

Any objection?

None

Motion passes

**Motion by Dave Nelson**

*To resolve SB comment number 280, add the following text at the end of Clause 8.1.4, as a new numbered bullet item:*

"8. The destination STA chosen by the transmitter is the correct destination. For example, Address Resolution Protocol (ARP) and Internet Control Message Protocol (ICMP) are methods of determining the destination STA MAC address that are not secure from attacks by other members of the ESS. One of the possible solutions to this problem might be for the STA only to send or receive frames whose final destination or source addresses are the AP, and for the AP to provide a network layer routing function, but such solutions are outside the scope of this standard."

Second: Mike Moreton

Discussion:

None

Any objection?

None

Motion passes

**Motion by Dave Nelson**

*To resolve SB comment number 344, in Clause 8.1.1, delete the first sentence.*

Second: Jesse Walker

Discussion:

None

Any objection?

None

Motion passes

**Motion by Dave Nelson**

*To resolve Sponsor Ballot comment number 179, in Clause 8.2.1.3, delete the following two sentences from the first paragraph:*

“WEP-40 encryption keys shall be 40-bits in length. WEP-104 keys shall be 104-bits in length.”

Second: Jon Edney

Discussion:

None

Any objection?

None

Motion passes

**Motion by Dave Nelson**

*To resolve SB comment number 180, in Clause 8.2.1.4.3, change the second paragraph from:*

For WEP-40, bits 0 through 39 of the WEP key correspond to bits 24 through 63 of the seed, and bits 0 through 23 of the IV correspond to bits 0 through 23 of the seed, respectively. For WEP-104, bits 0 through 103 of the WEP key correspond to bits 24 through 127 of the seed, and bits 0 through 23 of the IV correspond to bits 0 through 23 of the seed, respectively. The bit numbering conventions in Clause 7.1.1 apply to the seed. The seed shall be the input to RC4, in order to encrypt or decrypt the WEP Data and ICV fields.

*To:*

For WEP-40, bits 0 through 39 of the WEP key correspond to bits 24 through 63 of the seed, and bits 0 through 23 of the IV correspond to bits 0 through 23 of the seed, respectively. The bit numbering conventions in Clause 7.1.1 apply to the seed. The seed shall be the input to RC4, in order to encrypt or decrypt the WEP Data and ICV fields.

Informative Note: For WEP-104, bits 0 through 103 of the WEP key correspond to bits 24 through 127 of the seed, and bits 0 through 23 of the IV correspond to bits 0 through 23 of the seed, respectively.

Second: Jesse Walker

Discussion:

None

Any objection?

None

Motion passes

**Motion by Dave Nelson**

*To resolve SB comment number 589, In Clause 8.1.2, delete the following informative note:*

Informative Note: Fielded implementations of Pre-RSNA Equipment may optionally implement RSN cipher suites, but would include a Vendor Proprietary Information Element describing the availability of the RSN cipher suites, instead of the RSN IE. This usage is outside the scope of this standard.

*And in Clause 4, delete the following acronym definition (no longer used):*



WPA      Wi-Fi Protected Access

Second: Jesse Walker

Discussion:

None

Any objection?

None

Motion passes

#### **Motion by Jesse Walker**

*Address Comments 224-226, 302, and 551 by replacing the body of 5.4.3.1 with the text:*

IEEE 802.11 authentication operates at the link level between IEEE 802.11 STAs. IEEE 802.11 does not provide either end-to-end (message origin to message destination) or user-to-user authentication.

IEEE 802.11 attempts to control LAN access via the authentication service. IEEE 802.11 authentication is an SS. This service may be used by all STAs to establish their identity to STAs with which they communicate, in both ESS and IBSS networks. If a mutually acceptable level of authentication has not been established between two STAs, an association shall not be established.

IEEE 802.11 defines two authentication methods, Open System Authentication and Shared Key Authentication. Open System Authentication admits any STA to the DS. Shared Key Authentication relies on WEP to demonstrate knowledge of a WEP encryption key. The IEEE 802.11 authentication mechanism also allows definition of new authentication methods.

An RSNA also supports authentication based on IEEE 802.1X, or Pre-Shared Keys (PSKs). IEEE 802.1X authentication utilizes the Extensible Authentication Protocol (EAP, RFC 2284bis) to authenticate STAs and the AS with one another. This standard does not specify a mandatory-to-implement EAP method. Clause 8.4.4 describes the IEEE 802.1X Authentication and PSK usage within IEEE 802.11 IBSS.

In an RSNA, IEEE 802.1X Supplicants and Authenticators exchange protocol information via the IEEE 802.1X Uncontrolled Port. The IEEE 802.1X Controlled Port is blocked from passing general data traffic between the STA and the AP until an IEEE 802.1X authentication procedure completes successfully over the IEEE 802.1X Uncontrolled Port.

The Open System Authentication algorithm is used in both BSS and IBSS RSNAs, though Open System Authentication is optional in an RSNA IBSS. RSNA disallows the use of Shared Key Authentication.

Management information base (MIB) functions are provided to support the standardized authentication schemes.

A STA may be authenticated with many other STAs at any given instant.

Second: Don Eastlake III

Discussion:

None

Any objection?

None

Motion passes

Chair: Are there any further motions or discussion topics?

**Submission: Fred Stivers – Clarifying TKIP MIC Processing Format - doc 04/0097**

A Second WME plug-fest is coming up in 1.5 weeks. One of the tests will be WPA over WME. There is an inconsistency in Draft 7.0 from previous versions of the sequence of fields (priority) fed to the Michael MIC algorithm.

Comment: why was it reversed in the first place?

Comment: it can be viewed as either a byte stream to be processed by Michael, or an assembly. I viewed it as an assembly which is why I submitted a comment on it and it was changed. If it is better viewed as how Michael processes it, then I am fine with that.

Comment: the std is inconsistent with the terms byte and octet, but we should use octet to be consistent

**Motion by Fred Stivers**

*Instruct the editor to incorporate the changes specified in document 04/0094r0 into the TGi draft with the changing of the term “byte” to “octet”.*

Second: Dorothy Stanley

Discussion:

Comment: on the producer side, the stream gets created the way that the diagram exists now.

Comment: can we add a test vector that contains a non-zero priority field for TKIP?

Fred: we can take that as an action item to generate one.

Chair: should we replace the Priority field with an RFU/MBZ field?

Comment: there are no issues with the term “Priority” – there are no comments on that. There may be issues if we provide a non-zero priority example.

**Vote: 17-0-2 Passes****Discussion on QC, Replay Protection and Priority – Paul Lambert**

Comment: we could cut clause 8.3.3.5 and then TGe could add it back after TGi is ratified.

Comment: could we simply change the name of the term “QC” to “Priority”?

Comment: TGe can add this with the knowledge that it is reserved for when they go to RevComm.

**Straw Poll by Paul Lambert**

Clause 8.3.3.5 should be left in the TGi draft

Result: 14-1-6

Recessed until 8:00am tomorrow

**Thursday, January 15, 2004**

Chair: At the chairs mtg this morning, we discussed the plans for the next meeting. A motion was passed in November to empower TGi to conduct business. Meetings require 30 days notice. Conference calls require 10 days. We do not need a motion to schedule a meeting, but we do need an announcement. We talked about having an ad-hoc meeting prior to the March meeting. We want any new SB to close before the March meeting, so the meeting would have to be the week of February 16<sup>th</sup>.

Chair: Are there any motions for SB comment resolutions?

None

Chair: I would like to work in ad-hoc and break into the comment processing sub-groups until 4:00pm.

Comment: is there a new version of the SB Comments spreadsheet posted?

Chair: Revision 5 is posted

Chair: any objection to working in ad-hoc until 4:00pm?

None

Resume 4:00pm

**Submission: Paul Lambert – TGi Comment Resolution for CCMP – doc 04/0129r0**

Comment: Some of the “shall be” phrases were changed to “are be”.

Paul: We can either fix it in the motion or leave it to the editor to correct the grammar.

Comment: I would prefer that just the modified text appear as “changed” in the new draft, rather than the entire clause.

Paul: Then I will make the motion that the changes in this submission be incorporated into the draft, rather than replace the entire clause.

**Motion by Paul Lambert**

*Incorporate the red-marked changes indicated in document 04/0129r0 into the TGi draft.*

Second: Jesse Walker

Discussion:

None

Any objection:

Yes

Vote: 14-0-2 Passes

**Motion by Frank Ciotti**

*Replace the following bullet item in Clause 8.3.3.3:*

1. Increment the Frame Number (PN), to obtain a fresh PN for each MPDU, such that the Frame Number never **repeat** for the same Temporal Key (TK). Note that retransmitted MPDUs are not modified on retransmission.

*With:*

1. Increment the Frame Number (PN), to obtain a fresh PN for each MPDU, such that the Frame Number never **repeats** for the same Temporal Key (TK). Note that retransmitted MPDUs are not modified on retransmission.

Second: Dave Nelson

Discussion:

None

Any objection?

None

Motion passes

**Motion by Frank Ciotti**

*Replace the following sentence in Clause 8.3.3.2:*

The reserved bits are be set to zero (0) and are be ignored on reception.

*With:*

The reserved bits shall be set to zero (0) and shall be ignored on reception.

Second: Jon Edney

Discussion:

None

Any objection?

None

Motion passes

**Motion by Jon Edney**

*Replace the term “Frame Number” with “PDU Number” throughout the TGi draft.*

Second: Nancy Cam-Winget

Discussion:

Comment: this will draw more comments. We should simply reject the comment.

**Motion to Amend by Mike Moreton**

*Replace the term “Frame Number” with “Packet Number” throughout the TGi draft.*

Second: Jesse Walker

Discussion:

Comment: This will probably continue to draw comments.

Vote: 9-2-4 Passes

**Main Motion**

*Replace the term “Frame Number” with “Packet Number” throughout the TGi draft.*

Discussion:

Comment: why not simply create a new definition to resolve the issue (e.g. MIC Vs. MAC)

Vote: 10-2-4 Passes

**Motion by Frank Ciotti**

*Replace the following header text*

**8.3.3.5.1 AAD COnstructio with QC**

*with*

**8.3.3.5.1 AAD Construction with QC**

Second: Dave Nelson

Discussion:

None

No objection

Motion passes

**Straw Poll by Dave Nelson**

*Should the text of Clause 8.3.3.5 be labeled informative?*

Result: 0-11-5

**Motion by Dave Nelson**

*Replace the following header:*

**8.3.3.5 CCMP processing with QC (Informative)**

*With:*

**8.3.3.5 CCMP processing with QC**

Second: Thomas Maufer

Discussion:

Comment: against: if we make this normative, we make a requirement on TGe we did not have before.

Comment: for: if we leave it informative, we must remove all normative language from the text.

Comment: Removing the clause will draw comments as well. Perhaps leaving as informative and removing the normative language is the correct action.

Comment: we should leave as informative, and ask TGe to include as normative in their draft.

Comment: we could label as “Candidate for normative text for TGe”

Comment: The TG that completes last is responsible for adopting this text as normative.

Comment: We should trust TGe to do this. There is only a problem if TGe gets to RevComm before us.

Comment: We could reject the comment and indicate that the clause was placed in the draft for TGe.

Comment: Removing from the draft would be a mistake.

Comment: what’s the difference if it’s normative or informative?

Comment: if it’s normative, we’re locked in RevComm.

Comment: If we reject the comment because of the TGe procedural issue, the comment will go to RevComm and they will look at our reason for rejecting, and should find it reasonable. The alternate may not be true.

Comment: if we don’t reference TGe and simply have fields that are not defined, are we blocked in RevComm?

Chair: RevComm could

Call the question

Any objection?

None

**Vote: 3-5-8 Fails**

**Motion by Fred Stivers**

*Remove Clause 8.3.3.5 from the TGi draft.*

Second: Henry Ptasinski

Discussion:

Comment: In the straw poll yesterday we decided to keep this. My concern is not that TGe won't include security, but rather that what they adopt is correct.

Comment: The purpose of making the standards is not for the people in these meetings, but rather for the people who will be implementing them.

Comment: If the removal is in the minutes, can't we simply point them to the minutes.

Chair: If this clause is removed, TGi members could go to the TGe meetings to ensure that this text was adopted.

Comment: If we go to RevComm first, this is the proper action. If we remove it, TGe will not like it.

Comment: Is this Clause necessary in the TGi draft? Make a comment on the TGe LB that will get carried forward to SB that this text needs to be included.

**Vote: 10-2-3 Passes**

**Submission: Dave Nelson – TGi SB Comment Resolutions - doc 04/0137**

Comment: Removal of which sub-layer establishes an RSNA in Clause 8.1.3 makes the draft vague. There was specific text in this clause that had a few errors and was removed. That text should simply be corrected.

Dave: To correct the text would require significant work.

Any objection to recessing until 8:00pm?

None

Recessed at 5:51pm

Resume 8:00pm

Chair: Dell has volunteered to host a TGi meeting in Austin. The planned dates are January 18-20<sup>th</sup>. Are there other volunteers?

None

Chair: do we want a conference call a week before the meeting?

Comment: yes.

The consensus of the group is to hold a conference call on Monday, February 9<sup>th</sup> at 11:00am Eastern time.

**Motion by Frank Ciotti**

*IEEE 802.11i should conduct a conference call on February 9, 2004 at 11:00am Eastern time, and schedule a meeting for February 18, 19, and 20, 2004 in Austin, TX.*

Second: Al Potter

Discussion:

None

**Vote: 11-0-2 Passes**

**Motion by Dave Nelson**

*To resolve SB comment number 182, in Clause 8.3, replace the following text;*

Use of any of the confidentiality algorithms depends on local policies. IEEE 802.11 recommends not using TKIP except as a patch to pre-RSNA devices, since that confidentiality and integrity mechanisms are not as strong as those of CCMP. RSNA devices should only use TKIP when communicating with devices that are unable to communicate using CCMP.

*With:*

Informative Note: Use of any of the confidentiality algorithms depends on local policies. The confidentiality and integrity mechanisms of TKIP are not as robust as those of CCMP. TKIP is designed to operate within the hardware limitations of a broad class of pre-RSNA devices. TKIP is suitable for firmware-only, hardware-compatible upgrade of fielded equipment. RSNA devices should only use TKIP when communicating with devices that are unable or not configured to communicate using CCMP.

Second: Jesse Walker

Discussion:

None

Any objection:

None

Motion passes

**Motion by Dave Nelson**

*To resolve SB comment number 178, in Clause 8.1.4, change the last sentence of the bulleted item 92) from:*

The promiscuous roaming model, in which a STA associates with any AP instead of only authorized APs, does not and cannot provide security in a WLAN.

*To:*

The STA shares authentication credentials with the AS utilized by the selected AP or in the case of PSK the selected AP. The SSID provides an unprotected indication that the selected AP's authentication entity shares credentials with the STA. Only the successful completion of the IEEE 802.1X EAP or PSK authentication, after association, can validate any such indication that the AP is connected to an authorized network or service provider.

Second: Jesse Walker

Discussion:

None

Any objection?

None

Motion passes

**Motion by Dave Nelson**



*To resolve issues raised by SB comments 554 and 555, in Clause 8.5.1.2, change the Informative Note text from:*

Informative Note: If the AKMP is RSNA-PSK then a 256-bit Pre-Shared Key may be configured into the STA and AP or a pass-phrase may be configured into the Supplicant or Authenticator. The method used to configure the PSK is outside this specification, but one method is via user interaction. If a passphrase is configured then a 256-bit key is derived and used as the PMK **otherwise** the Pre-Shared Key is used directly as the PMK. Implementations may support different Pre-Shared Keys for each pair of communicating STAs.

*To:*

Informative Note: If the AKMP is RSNA-PSK then a 256-bit Pre-Shared Key may be configured into the STA and AP or a pass-phrase may be configured into the Supplicant or Authenticator. The method used to configure the PSK is outside this specification, but one method is via user interaction. If a passphrase is configured then a 256-bit key is derived and used as the **PSK. In any RSNA-PSK method,** the Pre-Shared Key is used directly as the PMK. Implementations may support different Pre-Shared Keys for each pair of communicating STAs.

Second: Don Eastlake

Discussion:

None

Any objection?

None

Motion passes

**Motion by Dave Nelson**

*To resolve SB comment 236, in Clause 10.3.14.2, change the text as shown:*

### **10.3.14.2 MLME-EAPOL.confirm**

#### **10.3.14.2.1 Function**

This primitive ~~confirms~~**indicates** that this EAPOL- Key frame has been ~~a~~**Acknowledg**~~C~~**K**ed by ~~the~~ IEEE 802.11 MAC.

#### **10.3.14.2.2 Semantics of the service primitive**

~~The primitive parameters are as follows:~~**There are no parameters for this primitive.**

MLME-EAPOL.confirm (  
Result Code  
 )

<u>Name</u>	<u>Type</u>	<u>Valid Range</u>	<u>Description</u>
<u>ResultCode</u>	<u>Enumeration</u>	<u>SUCCESS,</u> <u>TIMEOUT</u>	<u>Indicates that the EAPOL-</u> <u>Key frame has been</u> <u>ACKed by the target STA</u>

**10.3.14.2.3 When Generated**

This primitive is generated by the MAC ~~when an EAPOL-Key frame has been ACKed~~ as a result of an MLME-EAPOL.request being generated to send an EAPOL-Key frame.

**10.3.14.2.4 Effect of Receipt**

The SME is always notified ~~that whether or not~~ this EAPOL-Key frame has been acknowledged by the IEEE 802.11 MAC~~ACKed~~.

Second: Jon Edney

Discussion:

None

Any objection?

None

Motion passes

**Motion by Dave Nelson**

*To resolve SB comment number 237, in Clause 10.3.14.3, delete this entire clause, and renumber as appropriate. The effect of this change is to delete the **MLME-EAPOL.indication** primitive.*

Second: Jesse Walker

Discussion:

None

Any objection?

None

Motion passes

**Motion by Dave Nelson**

*To resolve SB comment number 244, in Clause 10.3.16.1.2 change the text as shown:*

**10.3.16.1.2 Semantics of the Service Primitive**

The primitive parameters are as follows:

MLME-SETPROTECTION.request (   
 Protectlist   
 )

Each Protectlist consists of the following elements:

Name	Type	Valid range	Description
Address	MAC Address	Any valid individual MAC address	This parameter is valid only when the key type is Pairwise, <u>STAK</u> ey, or when the key type is Group and is

			from an IBSS STA
ProtectType	Enum	Rx, Tx, Rx_Tx	The protection value for this MAC
<u>Key Type</u>	<u>Integer</u>	<u>Group, Pairwise, STAKKey</u>	<u>Defines whether this key is a Group or Pairwise key, or STAKKey key.</u>

Second: Mike Moreton

Discussion:

None

No objection

Motion passes

### Submission: Dorothy Stanley – doc 04/0160

Discussion:

Comment: I remember discussing two items and I don't see them. Liveness and Session Distinction. Did we decide that Liveness was a part of mutual authentication?

Comment: Yes.

Comment: How do the logistics of this work?

Dorothy: logistics going up – Bernard is taking the contents of this draft, and formatting it for IETF. The comments coming back will come back to me. If there are changes requested to the requirements, then we will have make those motions here.

Comment: the author of this document will be individual authors, not the 802.11WG. It may be better to have the WG.

Comment: the IETF limits the number of authors to five. You cannot have an organization be the author.

Comment: no new text is required for Liveness and Session Distinction as these are listed as “should”.

### Motion by Dorothy Stanley

*Approve the following text containing IEEE 802.11 requirements for EAP methods and request that the chair of IEEE 802.11 do the necessary editorial and formatting changes required and submit the text as an IETF Internet Draft and request publication as an IETF Informational RFC.*

## Abstract

The draft IEEE 802.11i MAC Security Enhancements Amendment makes use of IEEE 802.1X, which in turn relies on the Extensible Authentication Protocol (EAP). This document defines requirements for EAP methods used in IEEE 802.11 wireless LAN deployments.

The IEEE 802.11 Working Group has approved the material in this document and it is being presented as an IETF RFC for informational purposes.

### Introduction

The draft IEEE 802.11i MAC Security Enhancements Amendment [IEEE802.11i] makes use of IEEE 802.1X [IEEE802.1X-REV] which in turn relies on the Extensible Authentication Protocol (EAP), defined in [RFC2284bis]. Deployments of IEEE 802.11 WLANs today are based on EAP, and use several EAP methods, including EAP-TLS [RFC2716], EAP-TTLS [TTLS], PEAP [PEAP] and EAP-SIM [SIM]. These methods support authentication credentials that include digital certificates, user-names and passwords, secure tokens, and SIM secrets.

### EAP Credential types

The draft IEEE 802.11i specification requires that EAP authentication methods are available. Wireless LAN deployments are expected to use different credentials types, including digital certificates, user-names and passwords, existing secure tokens, and mobile network credentials (GSM and UMTS secrets). Other credential types that may be used include public/private key (without necessarily requiring certificates), and asymmetric credential support (password on one side, public/private key on the other).

### Mandatory requirements

EAP authentication methods suitable for use in wireless LAN authentication MUST satisfy the following criteria:

1. Generation of keying material. This corresponds to the "Key derivation" security claim defined in [RFC2284bis], Section 7.2.1.
2. Mutual authentication support. This corresponds to the "Mutual authentication" security claim defined in [RFC2284bis], Section 7.2.1.
3. Synchronization of state. This corresponds to the "Protected result indication" security claim defined in [RFC2284bis], Section 7.2.1.
4. Resistance to dictionary attacks. This corresponds to the "Dictionary attack resistance" security claim defined in [RFC2284bis], Section 7.2.1.
5. Protection against man-in-the-middle attacks. This corresponds to the "Cryptographic binding", "Integrity Protection", "Replay protection", and "Session Independence" security claims defined in [RFC2284bis], Section 7.2.1.
6. Protected ciphersuite negotiation. If the method negotiates the ciphersuite used to protect the EAP conversation, then it MUST support the "Protected ciphersuite negotiation" security claim defined in [RFC2284bis], Section 7.2.1.
7. Key strength. An EAP method suitable for use with IEEE 802.11 MUST be capable of generating keying material with 128-bits of effective key strength, as defined in [RFC2284bis] Section 7.2.1. As noted in [RFC2284bis] Section 7.10, an EAP method supporting key derivation MUST export a Master Session Key (MSK) of at least 64 octets, and an Extended Master Session Key (EMSK) of at least 64 octets.

### Recommended requirements

EAP authentication methods used for Wireless LAN authentication SHOULD support the following features:

8. Fragmentation. [RFC2284bis] Section 3.1 states: "EAP methods can assume a minimum EAP MTU of 1020 octets, in the absence of other information. EAP methods SHOULD include support for fragmentation and reassembly if their payloads can be larger than this minimum EAP MTU." This implies support for the "Fragmentation" claim defined in [RFC2284bis], Section 7.2.1.

### Optional features

EAP authentication methods used for Wireless LAN authentication MAY support the following features:

9. Channel binding. This corresponds to the "Channel binding" security claim defined in [RFC2284bis], Section 7.2.1.
10. End-user identity hiding. This corresponds to the "Confidentiality" security claim defined in [RFC2284bis], Section 7.2.1.

11. Fast reconnect. This corresponds to the "Fast reconnect" security claim defined in [RFC2284bis], Section 7.2.1.

### Non-compliant EAP authentication methods

EAP-MD5-Challenge (the current mandatory-to-implement EAP authentication method), is defined in [RFC2284bis] Section 5.4. EAP-MD5-Challenge and two EAP authentication methods defined in [RFC2284bis], One-Time Password (Section 5.5) and Generic Token Card (Section 5.6), are non-compliant with the requirements defined in this document.

### Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", RFC 2119, March, 1997.  
[RFC2284bis] Blunk, L. , et al., "Extensible Authentication Protocol (EAP)", draft-ietf-eap-rfc2284bis-08.txt, Internet-Draft (work in progress), January 2004.

### Informative References

[RFC2716] Aboba, B. and D. Simon, "PPP EAP TLS Authentication Protocol", RFC 2716, October 1999.  
[PEAP] Palekar, A., et al., "Protected EAP Protocol (PEAP)", draft-josefsson-pppext-eap-tls-eap-07.txt, Internet draft (work in progress), November 2003.  
[TTLS] Funk, P. and S. Blake-Wilson, "EAP Tunneled TLS Authentication Protocol (EAP-TTLS)", draft-ietf-pppext-eap-ttls-03.txt, August 2003.  
[EAPSIM] Haverinen, H. and J. Salowey, "EAP SIM Authentication", draft-haverinen-pppext-eap-sim-12.txt, Internet draft (work in progress), October 2003.  
[IEEE802] IEEE Standards for Local and Metropolitan Area Networks: Overview and Architecture, ANSI/IEEE Std 802, 1990.]  
[802.11] Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific Requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications, IEEE Std. 802.11-1999, 1999.  
[IEEE802.11i] Institute of Electrical and Electronics Engineers, "Unapproved Draft Supplement to Standard for Telecommunications and Information Exchange Between Systems - LAN/MAN Specific Requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications: Specification for Enhanced Security", IEEE Draft 802.11i (work in progress), 2003.  
[IEEE8021X-REV] IEEE Standards for Local and Metropolitan Area Networks: Port based Network Access Control, IEEE Std 802.1X-REV, Draft 8, December 2003.

### Acknowledgments

The authors would like to acknowledge members of the IEEE 802.11i task group, including David Nelson of Enterasys Networks and Clint Chaplin of Symbol Technologies for contributions to this document.

Second: Jesse Walker

Discussion:

None

**Vote: 14-0-0 Passes**

### Motion by Mike Moreton

*Include the changes specified in document 04/0159 into the TGi draft.*

Second: Dorothy Stanley

Discussion:

None

No objection

**Motion passes**

**Motion by Dorothy Stanley – Comments 414, 415: Accept**

*Delete the first informative note from Clause 8.4.1.2.*

Informative note: Implementations of IEEE 802.11 that conceal the SSID are non-conformant to the IEEE 802.11 specification. Without advertisements, if the AP is indeed authorized, the STA on average must present half its credentials before locating a correct one at initial contact. It may be difficult to distinguish the presentation of multiple credentials from a dictionary attack. Also, the IEEE 802.1X AS may have more than one set of credentials that will authenticate it to the mobile STA, each associated with a different SSID, and the mobile STA may therefore select one that is sub optimal for its needs.

Second: Nancy Cam-Winget

Discussion:

None

**Vote: 13-0-2 Passes**

Chair: any further business before adjourning?

Comment: There was discussion of some type of acknowledgement for Tim Moore's efforts.

Chair: I will make a motion tomorrow in the closing plenary to forward the letter to the IETF.

Chair: any objection to adjourning?

None

Adjourned at 9:30pm

**Minutes Not Yet Available**

**IEEE P802.11  
Wireless LANs**

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**Tentative Minutes for the TGk January 2003 Session**

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**Date:**

January 12, 2004

**Author:**

Paul Gray  
AirWave Wireless, Inc.  
1700 El Camino Real Suite 500  
San Mateo, CA 94025  
Phone: 650-286-6107  
Fax: 650-286-6101  
e-Mail: paul@airwave.com

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Monday, January 12, 2004  
10:30 AM – 12:30 PM

1. Chairperson calls the conference to order at 10:30 AM
2. Attendance
3. Agenda
  - a. Comment resolution on draft 0.9 Review
  - b. Quality Measure
  - c. Security of Actions Frames
  - d. Letter Ballot
4. Motion to amend agenda passes unanimously
5. Review IEEE 802 & 802.11 Policies and Rules
  - a. Patent Policy
  - b. Inappropriate Topics
  - c. Documentation
  - d. Voting
  - e. Roberts Rules
6. Technical Presentations
  - a. Shoji - 04/0018 and 04/0019
  - b. Edney - 04/1003 and 04/0036
  - c. Black - AP channel report
  - d. Black – Border Flag
  - e. Qi – 04/057 extensibility issues
  - f. Kwak (3-6 and PSNI issues)
7. Discussion on comment resolution
  - a. Question – how do we handle editorial comments? We should skip and concentrate on technical only
  - b. Chair – we are going to review by section from document 0001/01
8. Clause 10.3.11- Comment # 127- Black
  - a. Suggested Remedy - use 802.11h text as part of the baseline or at least fixing the errors.
  - b. Comment – there are only a few basic measurement differences.
  - c. Chair – we need a technical input. Is this only an editorial job?
  - d. Comment – it is difficult to review without hard copy. We have an opportunity in 10.3.1 to make changes. We need to create clause 10.3.12 - this is not an editorial job only.
  - e. Comment – When a mechanism is the same, we do not need to include, because it will show up twice in the 802.11 document. Speaker would like to hear editors comment.
  - f. Comment (Editor) – We can use the PICs to bring TGh text into TGk.
  - g. Comment – a third of my comments were deleted from draft, because of duplication. We do need to carefully TGh text utilized but not included in our draft.
  - h. Comment – We should have a sub-group meeting during the week to carefully review the TGh inclusions.
  - i. Comment – Editor can only make changes to motions voted on by the group, like spelling changes.
  - j. Comment – we have not specifically addressed section 10.3.11, but 10.3.x.
  - k. Resolution – open – utilize PICs to bring TGh text into draft
9. Section 10.3.11 - Kwak – Comment #227 Fix Figure 28 to show multiple measurement reports
  - a. Remedy - Modify chart to show first Measurement Report as required, then "compile measurement" can continue to produce and send additional measurement reports

- (optional) for the general case when multiple measurement request elements will be cascaded in a single measurement request.
- b. Comment – the diagram does not show that a measurement requests can be a very long list of cascading requests. We need to illustrate this.
- c. Comment – the diagrams are not designed to be a complete working of the primitives. We might want to expand these, but we should be careful. Other text in document will completely defines the protocol.
- d. Comment – there is no requirement that a report will come back.
- e. Comment – we should change the title to “examples” and not “diagrams”
- f. Comment – we need to add additional informative text.
- g. Comment – we should instruct the editor to note in the margin of Figure 28 Chair – what status do we assign to this comment “Pending TG work item”.
- h. Question – are we instructing the editor to change Draft .9 or the TGh’s diagram?
- i. Comment – Joe Kwak volunteers Simon Barber to lead the TGh integration group.
- j. Comment – Every draft change requires 75% approval of a vote.
- k. Comment – Simon suggested that Simon Black and Joe help him out.
- l. Comment – recommend that the group break the comments into logical sections, assigned a lead to each section, break into small groups, draft solution, and have the group vote on the resolution.
- m. Comment – editors have made changes in the past on the fly. We should do TGk work within the meeting and not in functional groups.
- n. Comment – CAC is trying to standardize this across all groups.
- o. Comment – we should go through all of the comments, categorize them, and then break into groups.
- p. **Resolution – open – functional group-h will review.**
- 10. Motion to recess for 15 minutes to update the comments database
  - a. Motion passes unanimously.
- 11. Chair – call meeting back to order 11:58 AM.
- 12. Clause - Section 10.3.11 – Comment #308 - Krac)
  - a. Change “in when” should be “when” on page 41 line 6.
  - b. **Resolution - accepted – instruct editor to make change as defined.**
- 13. Clause 10.3.11 – Comment # 225 – (– Need to clarify the following statement
  - a. Need to clarify the following sentence.
  - b. Remedy - Change to "Note that it is optional for a STA to send a measurement report (with Refused or Incapable mode bits set) when rejecting a request."
  - c. **Resolution accepted – instruct editor to make change as defined.**
- 14. Clause 10.3.12.1, 10.3.12.2, 10.3.1 – Comment #295 – Olson
  - a. Problem – sections are already included by TGh
  - b. Remedy – remove clause
  - c. Comment – this is an editorial task
  - d. Comment – we need to address this in a sub-group(h)
  - e. Comment – why should the functional group-h look at this and come to the same conclusions.
  - f. Comment – we cannot delete these, because we need to modify TGh’s information.
  - g. Comment – do not delete it, because we loose the content from the draft. We need to modify it.
  - h. **Resolution – open – review by functional group-h**
- 15. Clause 10.3.12.1.2 – Comment #309 - Karcz

- a. Problem - page 44, line 14, dialog token valid range should not include zero in a measurement request.
  - b. Remedy - make dialog token valid range 1-255
  - c. Resolution - accepted – instruct editor to make change ad defined.
- 16. Motion to recess for lunch
  - a. Moved by Tim Olson
  - b. Second by Harry Worstell
  - c. Motion Passes Unanimously

**Monday, January 12, 2004**  
**1:30 PM – 3:30 PM**

1. Chairperson calls the meeting to order at 1:35 PM.
2. Clause 10.3.13.4 – Comment #229 - Kwak
  - a. Problem - Explain multiple reports for single request frame.
  - b. Remedy - Add sentences: "Note that since a Measurement Request frame may contain multiple Measurement Request elements, a single MLME-RMEASURE.req may generate multiple MLME-RMEASURE.conf responses, each of which may generate a separate Measurement Report Frame. This is shown in Figure 28."
  - c. Comment – we have no restriction on cascading requests. A report element is linked to report request and the report must not be delayed.
  - d. Comment – the requests can be executed immediately, but the report does not have to be sent immediately.
  - e. Comment – we have ambiguity in queuing of requests and reports. Why don't we use the same mechanisms that TGh uses for measurements? TGh selected a scheduling mechanism.
  - f. Comment – our reports are much more complex than TGh. This comment is worthy of additional work for the entire group.
  - g. Comment – TGh is very similar to what we are doing in TGk. We need to make the text clearer. The primary purpose of TGh was radar detection. We should use TGh base and draft additional text to address TGk's specific needs.
  - h. Comment – we should create functional group for integration.
  - i. Resolution – open – functional group-h will address.
3. Clause 10.3.16 – Comment #230 - Kwak
  - a. Problem – Section is not needed since TPC is not modified.
  - b. Remedy - Delete this section
  - c. Resolution – open –functional group-h will address.
4. Clause 10.3.16.24 – Comment #310 - Karcz) Change "TCP" to "TPC" and extra period at the end of the line.
  - a. Problem – TCP should be changed to TPC
  - b. Remedy – change "TCP" to "TPC" on page 53 line 12 and delete extra period at the end of the sentence.
  - c. Resolution – open – instruct editor to make change ad defined
5. Clause 10.3 – Comment #224 - Kwak) (Comment 224)
  - a. Problem - MLME Interface not complete in current MIB definition.
  - b. Remedy - Suggest that someone (Simon Black?) or a committee be appointed to crosscheck MLME interface and primitive definitions against all new items defined in MIB. As we agreed in Seattle, the higher layer interface shall be provided by both a complete MIB and a complete MLME interface, as noted by Simon Black.
  - c. Comment – we should create a function team for addressing the MIB.
  - d. Chair – we need volunteers for this group.
  - e. Resolution – open –functional team-MIB will address
6. Clause 10.3 General – Comment #228 - Kwak
  - a. Problem – Primitives need unique names
  - b. Remedy - Suggest global replacement: replace "MLME-" with "MLME-R". This additional letter in all names will make TGk primitive names distinct from TGh primitive names.
  - c. Comment – our names match TGh.

- d. Comment – we can modify TGh using it as the base.
  - e. Comment – we can extend TGh’s request.
  - f. Resolution – open – functional team-h will address
7. Clause 11.1.3.2.1 - Comment #128 - Black - Add dot11RadioMeasurementEnabled MIB attribute
- a. Problem - Changes should be relative to the baseline and not to the last 802.11k draft.
  - b. Remedy – Correct change marking.
  - c. Comment – editor will track two sets of changes.
  - d. Resolution – accept – instruct editor to only track changes to the baseline for letter ballot draft.
8. Clause 11.5 – Comment #231 – Kwak
- a. Problem – clause not needed since the TPC procedure is not modified, TGk does not need to revise/modify the TPC procedures in TGh.
  - b. Remedy – remove the clause.
  - c. Resolution – open – function team-h will address
9. Clause - 11.7.1 - Comment #41 – Edney – Non-serving channel is not defined
- a. Problem – no definition for the term “non-serving channel”
  - b. Remedy – none
  - c. Comment - Create a new functional team for creating/fixing definitions. Simon Black will head this functional group..
  - d. Resolution – open – functional team-definition will address
10. Clause 11.7.1, 11.7.4 - Comment #129 – Black
- a. Problem – no definition for the term “off-serving and non-serving” and the terms are not consistent
  - b. Remedy – define terms and change draft for consistency.
  - c. Resolution – open – functional team-definition will address
11. Clause 11.7.2 - Comment #42 – Edney
- a. Problem - Randomize implies a completely random value.
  - b. Remedy – change text to read “requires stations to add a random component to . . .”
  - c. Comment – we did mean Randomize in the text.
  - d. Comment – the value is bounded and expounded in other parts of the document
  - e. Joe Kwak objected to declining the comment.
  - f. Resolution – decline – the text is correct as defined in draft.
12. Clause 11.7.3 - Comment #130 - Black
- a. Problem – There does need to be a randomization interval in each request type within the measurement request frame.
  - b. Remedy - none
  - c. Comment – the intention was to send all the reports back at once.
  - d. Comment – delete the first sentence of the second paragraph of 11.7.3 “The Radio Measurement category requires stations to randomize the start time of the first measurement in a requested sequence”
  - e. Comment accepted.
  - f. Resolution – open – functional team-definitions will address.
13. Clause 11.7.3 - Comment #43 - Edney
- a. Problem - "start its measurement sequence as soon as possible..." - this is too onerous. “Start its measurement sequence as soon as possible” this not practical.
  - b. Remedy – changed to “as soon as practical”
  - c. Comment – changing to practical might clarify
  - d. Resolution – accept – instruct the editor to change the text as defined

14. Clause 11.7.3 - Comment #144 - Black
  - a. Problem - Randomization Interval does not clearly refer to the parameter in the request.
  - b. Remedy – Clarify that the randomization interval is the parameter in the request.
  - c. Chair rules that the comment stays open
  - d. Resolution – open – functional team-definition will address
15. Clause 11.7.4 - Comment #232 - Kwak
  - a. Problem – The paragraph is out of place
  - b. Remedy - merge 11.7.2 – 11.7.4 into two sections (1) off-channel measurements and (2) measurement timing move this paragraph to the second paragraph in 11.7.2.
  - c. Resolution - pending – assigned to Simon Black
16. Clause 11.7.4 - Comment #131 - Black
  - a. Problem – There is not a definition for a STA returning to the 'serving channel' for a length of time between measurements. How this does interacts with periodic measurements?
  - b. Remedy – Clarify statement
  - c. Resolution – pending - assigned to Simon Black
17. Clause 11.7.5 - Comment #233 - Kwak
  - a. Problem – Clarify first paragraph "...unacceptable power consumption, measurement scheduling conflicts, or other significant factors."
  - b. Remedy – Include all reason codes.
  - c. Comment – why not be concise and not include possible reasons.
  - d. Resolution – accept – to instruct editor to change first paragraph in section 11.7.4 deleting the reason codes
18. Clause 11.7.6 – Comment #234 - Kwak
  - a. Problem – Processing of measurement requests needs to be consistent with TGh.
  - b. Remedy - Delete these two paragraphs and replace with following text from TGh: "A STA that receives a Measurement Request frame from a STA in its BSS or IBSS shall parse the frame's Measurement Request elements in order, with measurements starting at the times specified by Measurement Request elements. A STA may ignore any group addressed Measurement Request frames."
  - c. Resolution – declined – functional team-h will address
19. Chairperson moves to recess for break and it unanimously accepted.

Monday, January 12, 2004

4:00 PM – 6:00 PM

1. Chairperson calls the meeting to order 4:07 PM
2. Clause 11.7.6 – Comment #142 - Black
  - a. Problem – Use of IBSS DFS elements for RRM is not specified
  - b. Remedy – Delete the sentence.
  - c. Resolution – accepted – instruct editor to delete the last paragraph of clause.
3. Clause 11.7.6 - Comment #44 - Edney
  - a. Problem - It says that only one request can be pending at a time. This is OK for AP-BSS but in IBSS this could result in a lot of lost measurement requests.
  - b. Remedy – none
  - c. Resolution – open – functional team-h will address
4. Clause 11.7.5 – Comment #45 - Edney – A STA that successfully requests..." How does a station know its request is successful until the reply is returned? (two occurrences)
  - a. Problem – A station will not know its request is successful until it receives the reply.
  - b. Remedy - Replace "successfully requests" with "issues a measurement request to".
  - c. Resolution – accepted - instruct the editor change Section 11.7.5 as described
5. Clause 11.7.6 - Comment #141 - Black
  - a. Problem – the labels in Table 12 are not industry standard terms
  - b. Remedy – Change labels to “Independent BSS” and “Infrastructure BSS”
  - c. Comment – should we change 11.6.6 Table 26A as well
  - d. Comment – objection to changing 11.6.6, because it was not submitted as a comment. We should not fix TGh and we are not using 11.6.6 in our draft.
  - e. Resolution – accepted – instruct editor to make changes as described to 11.7.6 only
6. Clause 11.7.6 - Comment #46 - Edney
  - a. Problem - “without undue delay” is not defined
  - b. Remedy – none
  - c. Resolution – decline the comment
7. Clause 11.7.6 - Comment #234 - Kwak
  - a. Problem – Our wording needs to be consistent with TGh
  - b. Delete these two paragraphs and replace with following text from TGh: "A STA that receives a Measurement Request frame from a STA in its BSS or IBSS shall parse the frame's Measurement Request elements in order, with measurements starting at the times specified by Measurement Request elements. A STA may ignore any group addressed Measurement Request frames." Resolution
  - c. Comment – we don't have queuing defined. TGh does not have queuing defined either. This will make it procedurally more difficult to define.
  - d. Comment – we need to consider that we don't define precedence.
  - e. Comment – we do have precedence defined already.
  - f. Comment – Unicast requests always takes priority and we will ignore broadcast request.
  - g. Motion to reject comment 234
    - Moved by Tim Olson
    - Second by Dave Bagby
    - For 4                  Against 1                  Abstain 10
    - Motion Passes
  - h. Resolution – declined – text is correct as written.
8. Clause 11.7.6 - Comment #235 - Kwak
  - a. Problem – Correct wording in paragraph 10



- b. Remedy - Change to "A STA shall not respond to. . ."
  - c. Resolution – accept – instruct editor to change document as defined.
9. Clause 11.7.6 - Comment 236
- a. Problem – Not applicable to RRM
  - b. Remedy - Delete last sentence
  - c. Resolution – accept – instruct editor to change text - see Comment #142
10. Clause 11.7.6 - Comment #237
- a. Problem – Autonomous reports should be enabled by default. If a STA feels that it is important for the AP to know the result of a measurement, it should try to report it. If the AP doesn't want it, it may disable future autonomous reports.
  - b. Resolution – Change last sentence to : "All autonomous measurement reports are enabled by default in a SSs or IBSS."
  - c. Comment – strike the entire sentence
  - d. Resolution – accept – instruct editor to delete the last sentence of clause 11.7.6
11. Clause 11.7.7.1 - Comment #132 - Black
- a. Problem – "A STA receiving a Beacon Request shall respond ...Previous sections (10, 11) make response optional depending on the STA receiving the request. This wording implies that response is mandatory. Some change of wording is required.
  - b. Remedy - Clarify
  - c. Resolution – accept - instruct editor to change "a STA receiving a Beacon Request shall respond" to "If a STA accepts a beacon request it shall respond"
12. Clause 11.7.7.1 - Comment #47 - Edney – "shall" should be "may"
- a. Problem – the "shall" should be "may"
  - b. Remedy – change the wording
  - c. Resolution – accept – instruct the editor to change the text – see comment #132
13. Clause - 11.7.7.2 - Comment #48 - Edney
- a. Problem – change "shall" to "may"
  - b. Remedy – change the wording
  - c. Resolution – accept – instruct the editor to change the text – see comment #132
14. Clause - 11.7.7.2 - Comment #239 - Kwak
- a. Problem – Fix description to agree with element definition
  - b. Remedy - Change sentences to : ". Each element contains one or more Frame Report quintuplets, each consisting of the Number of Frames, Phy Type, RCPI, BSSID and Transmit Address. Each quintuplet summarizes the traffic from one transmit address. The RCPI may be the weighted average or unweighted average of signal strengths of the individual frames.
  - c. Resolution – open – to be handled with comment on clause 7.3.2.20.2
15. Clause 11.7.7.3 - Comment #49 - Edney
- a. Problem – change "shall" to "may"
  - b. Remedy – change the wording
  - c. Resolution – accept – instruct the editor to change the text – see comment #132
16. Clause 11.7.7.4 - Comment #50 - Edney
- a. Problem – change "shall" to "may"
  - b. Remedy – change the wording
  - c. Resolution – accept – instruct the editor to change the text – see comment #132
17. Clause 11.7.7.5 - Comment #51 - Edney
- a. Problem – change "shall" to "may"
  - b. Remedy – change the wording
  - c. Resolution – accept – instruct the editor to change the text – see comment #132



18. Clause 11.7.7.5 - Comment # 311 - Karcz
  - a. Problem - Does the measuring station handle the cases of broadcast, multicast, TGe no Ack, or TGe burst Ack frames differently than unicast frames with ACK?
  - b. Remedy – Clarify
  - c. Comment –Frames that expect an ACK back
  - d. Comment – 1<sup>st</sup> sentence second paragraph and add the following to the end of the sentence “when an ACK is expected”.
  - e. Resolution – accept - instruct editor to add the following to text to end of the 1st sentence, 2nd paragraph “...when an ACK is expected.”
19. Clause 11.7.7.5 - Comment #239
  - a. Problem – the word triplet should be doublet
  - b. Remedy – change the text
  - c. Resolution accept – instruct the editor to change “doublet” to “triplet”
20. Clause 11.7.7.6 - Comment #313 -Karc) – change “sesing” to “sensing”
  - a. Problem – misspelling
  - b. Remedy – change “sesing” to “sensing”
  - c. Resolution – accept – instruct editor to change text as defined
21. Clause 11.7.7.6 - Comment #296 – Olson
  - a. Problem – References to TGE should be removed
  - b. Remedy – should remove
  - c. Resolution – comment accepted 2<sup>nd</sup> paragraph
  - d. Comment – we should generically defined QoS throughout the document and not use TGe’s terminology
  - e. Resolution – pending – assigned to Zhun to fix
22. Clause 11.7.7.6 - Comment #52- Edney
  - a. Problem – change “shall” to “may”
  - b. Remedy – change the wording
  - c. Resolution – accept – instruct the editor to change the text – see comment #
23. Clause 11.7.7.6 - Comment #312 - Kacz
  - a. Problem - “microwave” not qualified
  - b. Remedy – change “microwave” to “microwave oven”
  - c. Resolution – accept – instruct the editor to change text as defined
24. Clause 11.7.7.6 - Comment #240 - Kwak
  - a. Problem – procedure is not clearly defined nor or its uses
  - b. Remedy – supply examples of how feature works
  - c. Resolution – pending – assigned to Zhun to fix
25. Clause 11.8 - Comment #133 - Black
  - a. Problem – section is not relevant to RRM
  - b. Remedy - delete 11.8 and write an introductory paragraph for site reporting.
  - c. Comment – we do have a hole in the site report and site request.
  - d. Comment – he is only speaking to 11.8 fast roaming. Delete section 11.8 fast roaming sections.
  - e. Resolution – pending – assigned to Zhun to rewrite
26. Section 11.8 - Comment #53 - Edney
  - a. Problem – “Fast” is subjective
  - b. Remedy – delete “Fast”
  - c. Resolution – accept – instruct editor to change text as defined.
27. Clause 11.8 - Comment 354 - Edney
  - a. Problem – “security” does not belong in first bullet list

- b. Remedy – It belongs in second bullet
- c. Resolution – pending – assigned to Zhun to rewrite
- 28. Clause 11.8 - Comment #55 - Edney
  - a. Problem – the last paragraph first sentence is repeated
  - b. Remedy – delete the last paragraph
  - c. Resolution – pending – assigned to Zhun to rewrite
- 29. Clause 11.8 - Comment #56
  - a. Problem – “AP IE” in the last paragraph needs to be fully qualified
  - b. Remedy – fully qualify “AP IE”
  - c. Resolution – pending – assigned to Zhun to rewrite
- 30. Clause 11.8 - Comment #148 - Johnson
  - a. Problem – “Fast” should not be draft
  - b. Remedy – remove “Fast” from draft
  - c. Resolution – pending – assigned to Zhun to rewrite
- 31. Clause 11.8 - Comment #314 – Kacz
  - a. Problem – “Proprietary mechanisms” is not defined
  - b. Remedy – Clarify
  - c. Resolution – pending – assigned to Zhun to rewrite
- 32. Clause 11.8 Comment #297 - Olson
  - a. Problem – “Fast roaming” is not need in TGk draft
  - b. Remedy – remove “fast roaming” from draft
  - c. Resolution – pending – assigned to Zhun to rewrite
- 33. Clause 11.8.1 - Comment #143 – Black
  - a. Problem – roaming behavior should not be specified in TGk
  - b. Remedy – make this section only cover site report section
  - c. Resolution open – functional team-procedures will address
- 34. Clause 11.8.1 - Comment #134 – Black
  - a. Problem – site report should not be limited to a particular scenario
  - b. Remedy – Clarify
  - Resolution open – functional team-procedures will address
- 35. Clause 11.8.1- Comment #135- Black
  - a. Problem – Clause 10
  - b. Remedy – Delete clause 10
  - c. Resolution – pending – assigned to Zhun for rewrite
- 36. Clause 11.8.1 - Comment #143 - Black
  - a. Procedure should be created
  - b. Resolution - open
- 37. Clause 11.8.1 - Comment #241 - Kwak
  - a. Problem – clause does not strengthen the TGk draft
  - b. Remedy – change title of clause
  - c. Resolution – pending – assigned to Zhun to rewrite
- 38. Clause 12.3.4.11.2, 17.2.3.5, 18.4.5.16 - Comment #68 - Black
  - a. Problem – PSNI should not be used
  - b. Remedy – Change to RCPI
  - c. Resolution – accept – instruct the editor to change all references to PSNI to RCPI throughout the document
- 39. Clause 3.0 - Comment #149 - Johnson
  - a. Problem – Capitalize definitions
  - b. Remedy – change Transmit power control to Transmit Power

- c. Resolution – instruct editor to change text as defined
- 40. Clause 3.0 - Comment #63 - Black
  - a. Problem – editorial instructions should be bold italic
  - b. Remedy – change editorial instructions
  - c. Resolution – accept – instruct the editor to change the text as defined
- 41. Clause 3.0 - Comment #64 - Black
  - a. Problem – “fast roaming” and its specifications are not relevant to TGk
  - b. Remedy – delete “fast roaming” and its specifications from draft
  - c. Resolution – accept – instruct editor to change text as defined
- 42. Section 3.0 - Comment #150 - Johnson
  - a. Problems – there is no need to specify bands in text
  - b. Remedy - Remove “in both 2.4 GHz and 5 GHz bands”.
  - c. Comment – TGh already had the definition of TPC and 5 GHz
  - d. Comment – should modify TGh document
  - e. Comment – TPC text needs to remain. The definition needs to be expanded appropriately.
  - f. Resolution – open – functional team-h will address
- 43. Chair recesses meeting for dinner

**Monday, January 12, 2004**  
**7:30 PM – 9:30 PM**

1. Chairperson called the meeting to order 6:30 PM
2. Clause 11.7.6 - Comment #316 - Jose
  - a. Problem – fast roaming is not relevant to TGk
  - b. Remedy – remove fast roaming from draft
  - c. Resolution – accept – instruct editor to change text as specified in Comment #64
3. Clause 3.0 - Comment #318 – Jose
  - a. Problem – no definition of DFS
  - b. Remedy – add DFS definition
  - c. Resolution – decline – DFS is already defined in base
4. Clause 3.0 - Comment #315 - Jose
  - a. Problem – definition of PSNI is incomplete
  - b. Remedy - Precisely define the PSNI measure, or give a reference to the definition.
  - c. Resolution – accept - instruct the editor to delete the definition of PSNI until normative text it is formally introduced.
5. Clause 3.0,4,7.3.2.20.1, 15.4.5, 16.4, 17.5.5, 18.4.5 - Comment #67 - Black
  - a. Problem – PSNI is poorly defined
  - b. Remedy – remove reference to PSNI in these sections
  - c. Resolution – accept – instruct editor to change text as specified in Comment #315
6. Clause 3.0, 7.2.3.12, 7.3.1, 11, 7.3.219, 7.3.20 - Comment #66 - Black
  - a. Problem – TGk draft should only include changes to TGh base
  - b. Remedy – remove duplicate clauses
  - c. Resolution – open – functional group-h will address
7. Clause 3.0 - Comment #252 - Olson
  - a. Problem – definition of roaming to upper layers is ambiguous
  - b. Remedy – remove this definition
  - c. Comment – change roaming in the 11k draft to inter-BSS Mobility
  - d. Resolution – accept – instruct editor to change text as defined
8. Clause 3.0 - Comment #251 – Olson
  - a. Problem – fast roaming should not be defined in TGk
  - b. Remedy – remove this definition
  - c. Resolution – accept – instruct editor to change text as defined
9. Clause 3.0 - Comment #250 - Olson
  - a. Problem – RPI is already defined in base
  - b. Remedy – remove this definition
  - c. Resolution – accept – instruct editor to change text as defined
10. Clause 3.0 - Comment #249
  - a. Problem – TPC is already defined in base
  - b. Remedy – remove this definition
  - c. Resolution – accept – instruct editor to change text as defined
11. Clause 4.0 - Comment #59 - Andren
  - a. Problem – receive power indication should be receive power indicator
  - b. Remedy – change text
  - c. Resolution – accept – instruct editor to change text as defined
12. Clause 4.0 - Comment #151 – Capitalize Acronyms
  - a. Problem – Acronyms are not capitalized
  - b. Remedy – capitalize Acronyms (DFS, TPC, RPI, and RLAN)

- c. Resolution – accept – instruct editor to change text as defined
- 13. Clause 4, 5, 7, 11.5 - Comment #65 - Black
  - a. Problem – 11-03-786 text added to the draft is incorrect
  - b. Remedy – remove all text added by 11-03-786r1 until reviewed
  - c. Resolution – open – functional team-h will address
- 14. Clause 4.0 - Comment #253 - Olson) – Remove these abbreviations
  - a. Problem – DFS, TPC, RPI, and RLAN are already defined in base
  - b. Remedy – remove abbreviations
  - c. Resolution – accept – instruct editor to change text as defined
- 15. Clause 5.0 - Comment #319 – Jose
  - a. Problem – TPC and DFS services are outside the scope of 11k standard.
  - b. Remedy - remove 5.4.4 and 5.4.4.1, which does not refer to measurements. The appendix may/must contain these explanations of why these measurements are required.
  - c. Resolution – partially acceptance - h group will address.
  - d. Comment - we should write a few sentences on why it belongs in the TGh draft.
  - e. Comment – the 11k group feels that we are not adopting TPC as a new service. TGh had to restrain itself to the 5GHz bands and TGk feels that the mechanisms are useful independent of the band.
  - f. Resolution – open – functional team-h will address
- 16. Clause 5.0 - Comment #320 – Jose
  - a. Problem – Include the word “measurement” to indicate the capability is of a measurement service
  - b. Remedy – none
  - c. Resolution – decline - the group is not certain we got the meaning of the comment. There is already use of the word “measurement” in section 5.
- 17. Clause 5.0 - Comment #136 - Black
  - a. Comment – add measurement service definition in 5.3.1 for STA measurement.
  - b. Simon Black will write.
  - c. Resolution – pending- Simon Black will rewrite.
- 18. Clause 5.0 - Comment #1 - Paine – Needs explanatory architectural text.
  - a. Problem – No explanatory architectural text
  - b. Remedy – write text
  - c. Resolution – pending – assigned to Richard Paine to write text
- 19. Clause 5.1.1.5 - Comment #2 - Paine – Need discussion of the “Measured Wireless LAN”
  - a. Problem – no discussion of “Measured Wireless LAN”
  - b. Remedy- add a paragraph with the following text: 5.1.1.5 Interaction with Upper Layers (above IEEE 802 layers) - The primary interface to upper layers is through the MIBs. The MIBs enable SNMP, but they also enable mappings of drivers to the MIB structure using Object IDs. Object IDs are the primary interface of 802.11 to the upper layers and enable measurements and direct access to information about the radio environment.
  - c. Comment – this is out of scope for our TG.
  - d. Comment – we are already have some of this defined.
  - e. Comment – why not expand 5.1.1.4
  - f. Resolution – pending - assigned to Richard Paine to write– include MLME and expand 5.1.1.4
- 20. Clause 5.2.5 - Comment #3 - Paine) – Expound “Measured Wireless LAN”.
  - a. Problem – Draft lacks clause 5.2.5
  - b. Remedy – add clause 5.2.5
  - c. Resolution – pending – assigned to Richard Paine to write

21. Section 5.4 - Comment #256 - Olson
  - a. Problem - Text should only extend the text that was added by TGh
  - b. Remedy - Add the following line only, "One of the services is used for the used for the purpose of radio measurements."
  - c. Resolution – accept – instruct editor to change text as defined
22. Clause 5.4.4 - Comment #4 - Paine) – Why is TPC a required service of RRM?
  - a. Problem – TPC is not a required service of RRM
  - b. Remedy - delete
  - c. Comment – Transmit Power is the measurement elements for transmit power levels that are required for TPC and are the elements that need to be provided by 11k. Richard Paine will write with Peter Ecclesine's help.
  - d. Resolution – pending – assigned to Paine and Ecclesine to expand definition.
23. Clause 5.4.4, 5.4.4.1, 5.4.4.3 - Comment #257 - Olson
  - a. Problem - text is already in the base
  - b. Remedy – remove text
  - c. Resolution – open – functional group-h will address
24. Clause 5.5 - Comment #258 - Olson
  - a. Problem – action frame is included in TGh
  - b. Remedy – remove text
  - c. Resolution – open – functional group-h will address
25. Clause 5.7.2, 5.7.3, 5.7.8 - Comment #259 - Olson
  - a. Problem - text is already in the base
  - b. Remedy – remove text
  - c. Resolution – open – functional group-h will address
26. Clause 7.0 - Comment #321- Jose
  - a. Problem – TGh information is repeated in draft
  - b. Remedy – deleted duplicate text
  - c. Resolution – open – functional group-h will address
27. Clause 7.1- Comment #260 - Olson
  - a. Problem - Action frame bits already defined by TGh.
  - b. Remedy - remove
  - c. Resolution – accept – instruct editor to change text as defined.
28. Clause 7.1.3.1.2 - Comment #60 - Andren
  - a. Problem – we are not including the paragraph numbers and titles leading up to changes in the draft
  - b. Remedy – included paragraph numbers and titles leading up to changes
  - c. Resolution – accept - TGk editor will adhere to the editing method described
29. Clause 7.1.3.1.2 - Comment #5 - Paine
  - a. Problem - There no security for the management frames that 11k uses to take measurements and get responses
  - b. Remedy – require TGi to make the modification suggested by Mike Moreton
  - c. Comment – TGk will have an alternative technical presentation in Vancouver.
  - d. Resolution – pending - TGk chair will liaison with 11i for status
30. Clause 7.3.2.20.6 Table 0-10 - Comment #201 - Kwak)
  - a. Problem – reference to RCPI
  - b. Remedy – Change heading for column 2 to "Power Observed at Antenna"
  - c. Comment – clause reference reflected in meeting from 7.2.20.6 to 7.2.3.20.6
  - d. Resolution – accept – instruct editor to change text as defined.
31. Clause 7.2.3.1 - Comment #261 - Olson

- a. Problem – Duplicate TGh text
  - b. Remedy - Change should only include the following for the Country element, "Country element shall be present if dot11MultiDomainCapabilityEnabled is true or dot11SpectrumManagementRequired is true or dot11RadioMeasurementEnabled is true"
  - c. Resolution – open – functional group-h will address
32. Clause 7.2.3.12 - Comment #69 - Black
- a. Problem – Frame classes are not clearly defined
  - b. Remedy – Clarify
  - c. An action frame is defined in IEEE802.11h as being a class 1 management frame (clause 5.5). This implies that action frames are permitted in all states 1, 2 and 3. In an infrastructure BSS, the ability to request measurements and site reports when not associated is likely to be unacceptable.
  - d. Resolution – open – functional group-security will address
33. Clause 7.2.3.12 - Comment #266 - Olson
- a. Problem – text is already defined in TGh
  - b. Remedy – remove
  - c. Resolution – accept – instruct the editor to 7.2.3.12 from draft
34. Clause - 7.2.3.12 - Comment #322 - Jose
- a. Problem – need count and offset used to synchronize the action W.R.T , TBTT.
  - b. Comment – the comment is not relevant to section 7.2.3.12.
  - c. Resolution – decline - TGk has elected not to have precise start measurement timeframes
35. Section 7.3.2.19 - Comment #75 – Black
- a. Problem - Enable, Request and Report bit protocol definition would be enhanced by the inclusion of a table indicating what the combinations actually mean.
  - b. Remedy – include a table
  - c. Comment - Refer to Measurement Request element introduced by the inclusion of .11h into the baseline to correct.
  - d. Resolution – open – functional group-h will address
36. Motion to call for orders of the day
- a. Moved by Dave Bagby
  - b. Second by Simon Black

Wednesday, January 13, 2004  
8:00 AM – 10:00 AM

1. Chairperson calls the meeting to order at 8:05
2. Attendance
3. Straw Poll
  - a. Do you support going to technical presentations prior to restarting comment resolution this morning?  
  
Yes: 12                      No: 0                      Abstain: 3
4. Motion to change agenda
  - a. Moved by Simon Black
  - b. Second by Zhun Zong
  - c. Motion passes unanimously
5. Technical Presentation – John Edney – Security for Measurement Requests and Information – document 1003/02
  - a. Comment – this can only be done only after association, because it relies on TGi
  - b. Comment – probe can't be protect prior to association
  - c. Comment – more likely used for Beacons after association providing additional information that only want group to see
  - d. Comment – would like to see trust and threat model
  - e. Comment – it is not that important to receive protected frames prior to initial association – it will only make initial association a bit longer.
  - f. Comment – There is good reason to separate protection of information elements from protecting the data. An example would be a network sniffer which could collect statistical information from all stations in the group, but it could see the data.
  - g. Comment – how would you protect against a replay attack
  - h. Suggest protecting information elements in software or firmware
    - i. Rate of informational frames is less frequent that data frames
    - ii. Will not affect TGi throughput which is hardware based
  - i. Comment – BSS defines the group
  - j. Question – how do we resolve the issue that TGh's action frame is not protected? A station can't distinguish between a protected TGk action frame or an unprotected TGh action.
  - k. Can a group (BSS) have TGk clients and non-TGk clients? It is either protect or not?
  - l. Question - What do we do in mixed mode? What classes need to be protected? We need to understand the entire scope of security like which elements do you apply security.
  - m. Comment against proposal – we should define security first and decide what needs to be secure later.
  - n. Comment – concerns with using group keys. There is not a limit to the number of group keys that can be generated. The four keys described in the presentation are used to change the key.
  - o. Question – how do we get a security solution passed with the group's lack of security knowledge? There are good security people in the group and we have submitted normative text to support this proposal.
  - p. Comment for proposal – This is a mechanism for security and we need to separate what needs to be secured from the mechanism.
  - q. Comment – against the proposal because we should review the security scenarios.
  - r. Straw Poll



Is confidentiality useful for some TGk information?

Yes: 23

No: 2

Abstain: 3

s. Straw Poll

Does the group believe a security solution should be included before working group first letter ballot?

Yes: 13

No: 3

Abstain: 13

t. Straw Poll

Does the group believe that the security proposal presented meets the needs of TGk?

Yes: 13

No: 3

Abstain: 13

6. Chair move to recess – unanimously accepted

Tuesday, January 13, 2004  
1:30 PM – 3:30 PM

1. Acting Chairperson (Harry Wortsell) calls the meeting to order at 1:41
2. Review Agenda
3. Clause 7.2.3.19.1 – Comment #90 – Black
  - a. Problem – If the interval subfield is set
  - b. Remedy – none
  - c. **Resolution – open – assigned to Joe Kwak**
4. Clause 7.2.3.19.1 – Comment #79 – Black
  - a. Problem – In active scan mode, does the measuring STA use the active scan procedure in 11.1.3.2.2, e.g. use ProbeDelay, MinChannelTime, MaxChannelTime timers, or some other procedure.
  - b. Remedy - If the intention is to use the existing mechanism, then some additional clarification of procedure is required. If a separate procedure is to be defined, then this should not be termed active scanning.
  - c. Comment – Write a specific procedure about going through each of the channels sending a probe request.
  - d. Comment – call it active scanning and it uses procedure 11.1.3.2.2 with the following modifications.
  - e. **Resolution – open – assigned to Simon Black to develop procedure text**
  - f. Note – Simon does believe he can produce procedure this week.
5. Clause 7.3.2.19.1 – Comment #81 – Black
  - a. Problem - For passive scan mode, the text explicitly says that if the measurement is on the same channel, the STA carries out its normal data traffic operation. Is this also intended for active scan mode?
  - b. Remedy – strike the last sentence from the “passive scan paragraph” and globally define in 11.7. Comment – if on the serving channel continue with normal operations both passive and active mode
  - c. Comment – Copy the last of sentence “of the in passive scan” bullet to end of “active scan” paragraph.
  - d. Comment – Take it out and rework and place it into 11.7 where it applies all measurements and put it into 11.7
  - e. Comment – we don’t have an active scan procedure.
  - f. Comment - strike the last sentence from the “passive scan paragraph” in section 7.3.2 and globally define in 11.7.
  - g. **Resolution – open – somebody needs to draft the text for 11.7.**
6. Clause 7.3.2.19 – Comment #82 – Black
  - a. Problem - Beacon table mode implies some sort of stored beacon table. There is no mention elsewhere in this draft of a 'beacon table' - is this a requirement of .11k? If so the beacon table requirement should be described.
  - b. Remedy – Clarify
  - c. Comment – we can call it Beacon Table Mode – return any stored beacons from previous scans
  - d. Comment – we should state that stations can optionally store previous scans information.
  - e. Comment – possible resolution to return beacon report table
  - f. Comment – In beacon table mode you are requesting information from the MIB made by prior measurements.

- g. Comment – beacon table mode is a second request for something that you already provided.
  - h. Comment – a beacon request clears out the beacon report table.
  - i. **Resolution – pending – assigned to Tim Olson to clarify text**
7. Clause 7.2.3.19.1 – Comment #84 – Black
- a. Problem - I think this only applies to periodic reporting, since the actual measurement text does not allow measurements on specific BSSs - this would also mean active scanning for a specific BSSID. Therefore this should be reworded to indicate that BSSID indicates the BSSID to be used in filtering for conditional
  - b. Comment – can it be used for both one time and/or periodic
  - c. Remedy – Clarify
  - d. **Resolution – pending – assigned to Simon Black and tied to comment #79 above**
8. Clause 7.2.3.19.1 – Comment #85 – Black
- a. Problem - The text relating to BSSID is for infrastructure BSSs only. Presumably, for a non-periodic measurement and a broadcast BSSID here, independent BSSs will be reported too (contrary to the text which says ‘measurements are performed on any AP’)? In general, the treatment of independent BSSs is non-existent here. If periodic measurements are not to be performed on independent BSSs then this should be said.
  - b. Remedy – Clarify
  - c. Comment – we have not addressed IBSS mode up to now.
  - d. Comment – write something at the top of 7.2.3.19.1
  - e. **Resolution – accept – instruct editor to substitute for each occurrence of “AP” in 7.2.3.19.1 to “STA”.**
9. Clause 7.3.2.91.1 - Comment #86 – Black
- a. Problem - What is the interaction between randomization interval and periodic measurements? The text says that 'Periodic measurement shall begin at the indicated start time'. This ignores randomization.
  - b. Remedy – Clarify
  - c. **Resolution – open – functional team-procedures will address**
10. Clause Comment #87
- a. Problem – A diagram is needed to add clarity to the use of MSBs and LSBs in period and measurement interval subfields.
  - b. Remedy – Add diagram
  - c. **Resolution – pending – assigned to Joe Kwak**
11. Clause 7.2.3.19.1 – Comment #89 – Black
- a. Problem – Enable, Request and Report bit protocol definition would be enhanced by the conclusion of a table indicating what the combinations actually mean. This will be corrected by deletion of this clause and replacement by only changes to the .11h baseline
  - b. Remedy - Refer to Measurement Request element introduced by the inclusion of .11h into the baseline to correct.
  - c. **Resolution – pending – assigned to Joe Kwak**
12. Clause 7.2.3.19.1 – Comment #77 – Black
- a. Problem - Channel number indicates the channel number on which the requesting STA instructs the receiving STA to report detected beacons and probe responses' The intent is clear, but the wording poor - channel number is the channel on which the measurement should be made, not on which the instruction is made.
  - b. Remedy – text change
  - c. Comment – “Channel number indicates the channel on which the receiving STA shall carry out the requested measurement if request is accepted.

- d. Comment – stay consistent with TGh
  - e. Comment – use TGh and reference 17.8.3.3 (802.11a), 16.4.6.2 (802.11b), 19.5 (802.11g)
  - f. Comment – use regulatory text in TGj which defines bands
  - g. Comment – use the “measurement channel number” instead of “channel number”
  - h. Resolution – open – assigned to team-channel numbering
13. Clause 7.3.2.19.1 – Comment #80 – Black
- a. Problem - Improved precision of specification would be useful in the active scan mode bullet particularly. For example, 'the measuring STA shall transmit probe request on the specified measurement channel'. It could be argued that the text describing the composition of a beacon report is out of place here - should be with the report. Though if it remains here it contains 'one measurement report information element'
  - b. Remedy – improve the text
  - c. Comment – the word “on” is ambiguous
  - d. Resolution – pending – assigned to Simon Black relating to Comment #79
14. Clause 7.3.2.19.1, 11.7 – Comment 92 – Black
- a. Problem - There are several interactions between 7.2.3.19 measurement text with 11.7, such as:
    - i. 11.7.4 - implies that STAs must return to the 'serving channel' between off-channel measurements. This may interact with periodic measurement cycles.
    - ii. 11.7.6 - implies that only the most recent measurement request frame is active at each STA. This would not allow a low duty cycle background period measurement to be set up while requesting other measurements.
    - iii. 11.7.6 - states that reports shall be returned to the requesting STA without undue delay. This does not account for conditional reporting.
  - b. Remedy – 11.7 needs to be redrafted for the interactions
  - c. Comment – Periodic measurement is broken
  - d. Comment – TGh has a scheduling mechanism and TGk we do not have this mechanism and we have queuing mechanism.
  - e. Comment – TGh does not require/enforce start time. TGh never anticipated a great deal of request measurements.
  - f. Comment – Periodic management do not have real world value.
  - g. Comment - Some views of management a WLAN requires that the AP would put the periodicity in the AP. There is a paradigm where the periodicity is in the AP.
  - h. Resolution – open –functional team-procedures will address
15. Chair moves to adjourn for break which unanimously accept

Tuesday, January 13, 2004  
4:00 PM – 6:00 PM

1. Acting Chairperson (Harry Wortsell) calls meeting to order
2. Clause 7.3.2.19.1, 11.7 – Comment # 91 – Black
  - a. Problem – What happens if a STA from which a measurement has been requested roams, or disassociates from a requesting AP?
  - b. Remedy – Clarify
  - c. Comment – At the station upon disassociation or disassociation the request would be dropped.
  - d. **Resolution – open – team-procedures will address**
3. Clause 7.2.3.19.1, 11.7 – Comment #78
  - a. Problem - Randomization interval is intended to avoid collisions between STAs when multicast measurements are requested. For this to work successfully it is important that each STA picks a random number and some note about statistical independence between STAs probably ought to be added (see the text in the base standard for IBSS BSSID for an example)
  - b. Remedy – See text below

#### **11.7.3 Measurement Start Time**

A STA that accepts a measurement request sequence specified within a measurement request frame shall process the first measurement in the sequence as soon as practical after receiving the request.

The Radio Measurement category permits a randomization interval to be specified for measurement start times. This avoids the traffic storms that could arise with synchronized broadcast and multicast measurements. Prior to making each measurement in the requested sequence, the STA shall calculate a random delay distributed uniformly in the range 0 to the randomization interval specified in the measurement request. The STA shall wait for this delay prior to making the measurement. It is important that designers recognize the need for statistical independence among the random number streams among STAs.

- c. Comment – There are other comments that need to be incorporated into this text.
  - d. Comment – This is a good start – one comment at a time.
  - e. **Resolution – accept – to instruct the editor to incorporate Simon's text above into clause 11.7.3**
4. Clause 7.3.2.19 – Comment # 94 – Black
  - a. Problem - Each measurement request starts with the text '...and contains the Measurement Duration and Channel Number for which the request applies'. Since almost all requests contain other fields and there is an illustrative figure, this is partial information that is redundant and should be removed.
  - b. Remedy - Just say ...the measurement request field corresponding to an xxx request is shown in figure xxx'
  - c. **Resolution – accepted unanimously – instruct the editor to incorporate the remedy above**
5. Clause 7.3.2.19, 7.3.2.20 – Comment #72 – Black
  - a. Problem - It would make sense if the Measurement Type numbering here/order in the type definitions table matched the order in which the measurement requests appear in the draft.

- b. Remedy – Reorder the measurement request and report section to match the order of the table.
  - c. **Resolution – open – functional team-h will address**
- 6. Clause 7.3.2.19, 7.3.2.20 – Comment #97 – Black
  - a. Problem - It is not obvious what measurement duration means for this measurement and at least a short description ought to be given.
  - b. Remedy - Add that duration may be set to 0 to make an instantaneous report, or to duration to request measurement in a time window.
  - c. Comment – There needs to be explanation of duration.
  - d. Comment – Consider the necessity for randomization interval
  - e. **Resolution – open – assigned to Simon Black to draft text**
- 7. Clause 7.3.2.20.1 – Comment #103 – Black
  - a. Problem - PHY type could report PHY type using the 802.11 MIB dot11PHYType coding, thereby eliminating the need for a special table here and automatically including support for future PHY types. This is also consistent with that used in 7.3.2.22 for site reporting.
  - b. Remedy - Have PHYType coded according to the value of dot11PHYType corresponding to that PHY type. Modify text and delete table 0-7.
  - c. Comment – deleting the table and only having normative text seems backwards.
  - d. Comment – the dottPHYType is already included in the MIB/base
  - e. **Resolution – accepted unanimously – instruct the editor incorporate the changes defined**
- 8. Clause 7.3.2.20.1 – comment #100 – Black
  - a. Problem - Parent TSF contains the lower 4-bytes of the serving measuring STA's TSF value at the time the measuring STA received the beacon, or probe response frame.
  - b. Remedy - Replace with – “Parent TSF shall contain the lower 4-bytes of the measuring STA's TSF value at the time that STA received the beacon, or probe response frame being reported.”
  - c. Comment – It is only editorial
  - d. **Resolution – accept – to instruct the editor to incorporate the changes defined.**
- 9. Clause 7.3.2.20.1 –Comment #101 – Black
  - a. Problem - 'The Received Elements ... must be included ... will hereby enclose information about the 802.11 enhancements supported ...'
  - b. Remedy - 'The Received Elements ... shall be included ... This provides information about the functionality of the STA that transmitted ...'
  - c. **Resolution – accept – to instruct the editor to incorporate the changes defined.**
- 10. **Clause 7.3.2.20.1, 11.7 – Comment #98 – Black**
  - a. Problem - Regarding the duration in the measurement report...Is it possible to report shorter measurement duration than that requested due to STA specific constraints, or does the reported duration always equal that requested? Do measurements have to be taken in one continuous duration of the requested length, or can the duration be combined of several shorter periods?
  - b. Remedy – Clarify
  - c. **Resolution – open – functional team-procedures will address**
- 11. Clause 7.3.2.20.2 – comment #107 – Black
  - a. Problem - 'CCA Busy Fraction shall indicate the fractional duration over which CCA indicated ...' Is this just physical CCA, or does it include NAV.
  - b. Remedy - Suggest this should include both physical and virtual carrier sense, i.e. it should be carrier sense as defined in 9.2.1 which is the combination.
  - c. Comment – Physical carrier sense seems to be the most useful – if a new PHY comes along.

- d. Comment – the original intent was to include the NAV
  - e. Comment – Simon can generate text or move it to procedure
  - f. Resolution – pending – Simon Black will draft text.
12. Clause 7.3.2.20.2 – Comment #106 – Black
- a. Problem - Figure 0-12 has a received signal power field but this is RCPI in the description.
  - b. Remedy - Use RCPI and complete TBD in description.
  - c. Resolution – accepted unanimously – to instruct the editor to incorporate the changes defined.
13. Clause 7.3.2.20.4 – Comment #109 – Black
- a. Problem - The Noise Histogram Report .... When CCA indicates not busy 802.11 signal is present.' STAs are unlikely to be able to receive an 802.11 signal of any PHY type therefore this needs to be re-phrased.
  - b. Remedy – Propose rewording “When CCA indicates not busy.”
  - c. Comment – CCA has 2 reasons for being set (1) Energy Detection (2) Symbols are recognizable
  - d. Comment – the Noise Histogram has to be able to deal with both reasons for CCA.
  - e. Comment – CCA is either 1 or 0
  - f. Comment – there are 4 or 5 modes for CCA
  - g. Comment – We are trying to measure background noise.
  - h. Resolution – open – team-procedures will address
14. Clause 7.3.2.20.7 – Comment #111 – Black
- a. Problem – The description of how measurement interval is used for this measurement needs clarification.
  - b. Remedy – none
  - c. Resolution – pending – Simon Black will draft text same as Comment #97
15. Clause 7.3.2.21, 7.3.2.9 – Comment #112 – Black
- a. Problem – It would improve the efficiency of join and passive scan significantly if the AP Channel Report element was included in beacon frames as well as Probe Response Frame
  - b. Remedy - Add Channel Report element to Beacon frames too.
  - c. Resolution – pending – Simon Black has a technical presentation scheduled for tomorrow.
16. Clause 7.3.2.22 – Comment #113 – Black
- a. Problem - The length field is variable ... BSSID Status ...Should be BSSID Match Status
  - b. Remedy – Correct the text
  - c. Resolution – accepted unanimously – to instruct editor to incorporate changes defined
17. Clause 7.3.2.9 – Comment #71 – Black
- a. Problem - The notes column for Probe Response Frame Body says 'The AP Channel Report information element is only present within Probe Response frame generated by a Radio Resource Measurement capable AP'. This is imprecise and the inclusion should be based on a MIB attribute as for the capabilities subfield in 7.3.1.4. In addition, it might be prudent to have two MIB attributes - dot11RadioMeasurementCapable (read-only) to allow AP capabilities to be read, and dot11RadioMeasurementEnabled (read-write) to allow .11k functionality to be enabled.
  - b. Remedy - Change notes field to say 'The AP Channel Report information element shall be present if dot11RadioMeasurementEnabled is true'. Note that this MIB attribute, though referenced in 7.3.1.4 is not present in the MIB definition and must be added.
  - c. Resolution – pending – Simon Black with provide technical presentation tomorrow.
18. Clause 7.4.1.6 – Comment #122 – Black
- a. Problem - There is no need for an activation delay field in the Site Report Request and it doesn't appear in e.g. Measurement Request (so doesn't seem to be there for consistency)



- b. Remedy - Remove Activation Delay
  - c. Resolution – accepted unanimously – to instruct the
19. Clause 7.4.1.8 - Comment #126 – Black
- a. Problem – Last paragraph ...The STA receiving the frame shall start preparing for roaming before the Disassociation frame. This is a STA decision. It may decide to do nothing - replace shall with may.
  - b. Remedy - Remove mandatory behavior.
  - c. **Resolution – accepted unanimously –instruct the editor to change text as defined.**
20. Clause 7.4.1.8 – Comment #125 – Black
- a. Problem - ...the disassociation will be sent from the AP ...Clarify as 'Disassociation Management frame'.
  - b. Comment – “fame” should be “frame”
  - c. Remedy – “. . . a Disassociation Management frame will be sent from the AP
  - d. **Resolution – accept instruct the editor to change text as defined.**
21. Clause Annex D – Comment #137 – Black
- a. Problem - What is the interaction between the MIB and primitive interface? If the primitive interface is used to request a measurement, does the MIB reflect the measurement request and report.
  - b. Remedy – none
  - c. **Resolution – open – team-procedures will address**
22. Clause Annex D – Comment #145 – Black
- a. Problem - dot11APServiceLoad concerns me from two perspectives:
    - i. It is an INTEGER type in the counters table - where everything else is a Counter32
    - ii. I'm not sure how it would be used in practice. It is not a standardized measure of load (number of associations, proportion of time channel busy, etc...) so it would be difficult to compare two values that might have different methods of calculating the figure. Neither is it available to STAs unless they have some ability to query the AP MIB.
  - b. Remedy – none
  - c. **Resolution – open – team-procedures will address**
23. Call for the orders of the day by Dave Bagby
- a. Moved by
  - b. Second by



**Thursday January 14, 2004  
8:00 AM – 10:00 AM**

1. Chairperson calls the meeting to order at 8:03 AM
2. Review Agenda
  - a. Presentations
  - b. Continue review of comments
  - c. Agenda approved without objections
3. Technical Presentation - Effective of frame length optimization – Shoji Sakurai - 11-04/0018
  - a. Document 04/0019 has normative text
  - b. Discussion
    - i. Paper concludes optimized frame lengths improves throughput under heavy interference
    - ii. Last night concluded “not CCA does not mean not noise”
    - iii. Suggesting 4 more histograms
    - iv. Author requests these histograms be mandatory
    - v. Should remain optional...not every one wants to use it• comment: making them optional limits the availability for use and feature
    - vi. Question - What is the criteria for optional or mandatory
  - c. Motion - Move to instruct the editor to incorporate the text from document “11-04-0019-000k-introducing subtype medium sensing time into pics.doc” into the next version of the TGk draft specification document.
    - i. Mover – Shoji Sakurai
    - ii. Second – Zhun Zong

For: 2

No: 5

Abstain: 7

Motion Fails

4. Technical Presentation - Revised AP Channel Report – Simon Black - 04/123
  - a. The bit map was not scaleable and that new bands are coming available
  - b. Motion to come soon - this will close 20 to 25 comments in our review
5. Review Agenda
  - a. Add Simon’s second presentation
  - b. Add Joe Kwak’s presentation between 2-4
  - c. New Agenda approved unanimously
6. Technical Presentation - Extensibilities Issues in 11k – Emily Qi - 04/0057r1
  - a. Document 04/0019 has normative text
  - b. Discussion
    - i. Wants to add vendor Specific measurement to the draft
    - ii. TGh offered the same idea and it failed to be voted into the draft
    - iii. Standards are to set a set of rules for all to follow and not have proprietary items in the standards
    - iv. 802.3 had vendor type and IEEE left the frames there ... TGk needs to be able to communicate across vendors
    - v. ITU Permits this - different standards process information different ways
    - vi. TGk will end at some point this will permits things to be added
    - vii. If it is added out side of the standard it is not standardized to all vendor specific field is a good thing
  - c. Straw Poll  
Should 802.11k resolve extensibility issues?

Yes: 7                      No: 5                      Abstain: 8

- d. Straw Poll – Vendor Specific Measurement type be added to 11k?

Yes: 2                      No: 12                      Abstain: 9

7. Technical Presentation - Border Flag in IEEE 802.11 Site Reporting – Simon Black - 03/947r1

- a. Document 03/04/0019 has normative text

- b. Discussion

- i. Need more clarification of the border of ESS to Cellular network
- ii. What happens if you are also on the border of another ESS at the same time
- iii. 802.11 does not define ESS to ESS association
- iv. Service providers could use this bit to gain advantage over other providers.
- v. wording is unclear
- vi. The hint of the border may be worse for a roaming algorithm the help it
- vii. Administratively set bit with purposes unspecified....so there is not enough information
- viii. Want latitude, longitude and altitude on one bit
- ix. At a border AP you are just as likely to walk back into the building as to go outside

- c. Straw Poll

Do you support the concept of border flag as in (947 & 944)?

Yes: 16                      No: 7                      Abstain: 8

**Thursday January 14, 2004  
10:30 AM – 12:30 PM**

1. Chairperson calls the meeting to order at 8:00 AM
2. Technical Presentation - STA disassociation behavior – Joe Kwak - 11-04/106r0
  - a. Disassociation behavior implemented in STAs today varies a great deal. This is a problem because a STAs just disappears causing uncertainty at AP, which makes it difficult to implement load and admission control
  - b. Proposal to make sending the DISASSOCIATION frame mandatory (when possible)
  - c. Comment- suggest a PICS proposal
  - d. Proposed normative text is in 11-04/105r0.
  - e. Discussion
    - i. Comment against (David Engwar) - The STA always tries to stay within the network
    - ii. Comment against (Dave Bagby) - power down does not necessarily mean that you want to leave the network
    - iii. Question – is this reassociation change? No
    - iv. Comment against (Bob O'Hara) - This is a problem for roaming, when you leave a BSS. You can not re-associate if you have disassociated, which is not good.
  - f. Straw Poll  
Do you feel that 5.4.24 station requirements for disassociation need to be strengthened?  
  
Yes: 4                      No: 17                      Abstain: 5
  - g. Straw Poll  
Would a PICS element to indicate conformance for disassociation notification be helpful?  
  
Yes: 4                      No: 18                      Abstain: 4
3. Technical Presentation - Proposed Text for Site Report Modification – Joe Kwak - 11-04/107r0
  - a. The document proposes text for adding the AP\_Service\_Load measurement to the Site Report.
  - b. Discussion
    - i. Comment against (Zhun) - because caution for any effort making the site report containing non-static information
    - ii. Comment against (Black) - Usage of information? Difficult to compare, because the number means different things for different APs
    - iii. Joe - we get information whether the AP wants to accept more associations or not (level above or less than 128). Therefore it is useful
    - iv. Question - what does this cover that TSPEC does not cover?
  - c. Straw Poll  
Do you support moving the AP service load from the counters table to the site report?  
  
Yes: 5                      No: 2                      Abstain: 17
4. Technical Presentation - Text proposal on PICS for TPC – Joe Kwak - 11-04/108r0
  - a. The proposal for the 11k PICS in the present document is identical in all aspects to the TPC service relevant entries in the 11h PICS.
  - b. Discussion
    - i. Comment – uncertainty on capability bits
    - ii. Comment – see section 11.5

- iii. Comment - only mandated in some of the 5 GHz bands, not in 4.9 and 2.4 GHz - some of the PICS items need fixing up
  - iv. Comment - TPC can be useful, even if it is not required by regulation. What is the purpose?
  - v. Answer - useful measurement - there are errors in proposal. At least two changes will be done
- c. Joe will rework proposal
- 5. Vote to approve minutes of the teleconferences 11-04059r.
  - a. No objections – approved unanimously
- 6. Vote on Technical Presentation 11-04/123 – Simon Black
  - a. Motion - To instruct the editor to incorporate the text from document 11-04/123r0 into the next version of the IEEE802.11k draft  
Mover – Simon Black  
Second – Hasse Sinivaara
- For: 18No: 0Abstain: 9

Motion Passes
- 7. Chairperson recesses for lunch at 12:32 PM.

**Thursday January 15, 2004**  
**1:30 PM – 3:30 PM**

1. Chairperson calls the meeting to order at 1:30 PM
2. Roger Durand is appointed temporary secretary
3. Review Agenda
  - a. Presentations
  - b. Continue review of comments
  - c. Agenda approved without objections
4. Work on comment resolution
5. Clause 7.3.2.19.1 – Comment #280 – Olson
  - a. Vote on Comment #280

For: 7          Against: 3          Abstain: 5

Vote fails

6. Chairperson recesses meeting until 4:00 PM

**Thursday January 15, 2004  
4:00 PM – 6:00 PM**

1. Meeting called to order by Richard at 4:00 PM
2. Technical Presentation – Joe Kwak - 04/109r0 and 04/110r1
  - a. Straw Poll

Would you support incorporation of PSNI as a signal quality indicator with the normative text presented including 04/100r0, assuming the follow on work of integrating PSNI into the TGk draft will be completed”?

For: 6                  Against: 4                  Abstain: 12
  - b. Motion

Move to instruct the editor to incorporate the text from document 11-04-0110r0-k-psni\_normtext.doc into the TGk draft specification.

Moved: Joe Kwak  
Second: Roger Durand

For: 3                  Against: 8                  Abstain: 8

Motions Fails
3. Continue comment resolution
4. Chairperson recesses until 7:30 PM

Thursday January 15, 2004

7:30 PM – 9:30 PM

1. Meeting called to order by Richard at 7:30 PM
2. Continue comment resolution
3. Motion

Move to empower TGk to hold meetings as required to conduct business necessary to progress the letter ballot process, including creating and issuing drafts for letter ballots, conducting teleconferences and handling other business necessary to progress through the IEEE standards process.

Moved: Bagby

Second: Olson

For: 12                  Against: 1                  Abstain: 1

Motion Passes

4. Straw Poll  
Are we ready to go to letter ballot?

For: 0                  Against: 12                  Abstain: 4

5. Motion  
Move to instruct the editor to include the contents of the incorrectly labeled document D0.11 into 11k draft

Moved: Black

Second: Srini

For: 1                  Against: 12                  Abstain: 2

Motion Fails

6. Meeting adjourned.

# 802.11m Meeting Report July 2003



# Goals for July 2003

- Interpretation requests
  - Draft response to requester and forward to WG
- Other inputs
  - Review
- Develop updates to standard
  - Volunteers needed

# Submissions?

- Are there any submissions?
  - Terry Cole: 199r1 – WG Editor's potential errata list
  - Andrew Myles: 382r7 – Annoying things
- Are there any new interpretation requests?
  - Delayed CFP Beacon

# Proposed Agenda

- Review IEEE Patent Policy
- Review interpretation request procedure
- New business
  - Review interpretation requests received
  - Draft responses to interpretation requests
  - Forward to full WG
  - Review other inputs
  - Develop work plan to update standard for interpretation requests and other inputs
  - Begin work on updates to standards
- Adjourn

# Agenda adoption

- Moved: To adopt agenda as proposed
  - Moved: Andrew Myles
  - Second: Leo Montaban
  - Vote: unanimous consent

## IEEE-SA Standards Board Bylaws on Patents in Standards

### **6. Patents**

IEEE standards may include the known use of patent(s), including patent applications, provided the IEEE receives assurance from the patent holder or applicant with respect to patents essential for compliance with both mandatory and optional portions of the standard. This assurance shall be provided without coercion and prior to approval of the standard (or reaffirmation when a patent becomes known after initial approval of the standard). This assurance shall be a letter that is in the form of either

- a) A general disclaimer to the effect that the patentee will not enforce any of its present or future patent(s) whose use would be required to implement the proposed IEEE standard against any person or entity using the patent(s) to comply with the standard or
- b) A statement that a license will be made available without compensation or under reasonable rates, with reasonable terms and conditions that are demonstrably free of any unfair discrimination

This assurance shall apply, at a minimum, from the date of the standard's approval to the date of the standard's withdrawal and is irrevocable during that period.

## Inappropriate Topics for IEEE WG Meetings

- Don't discuss licensing terms or conditions
- Don't discuss product pricing, territorial restrictions or market share
- Don't discuss ongoing litigation or threatened litigation
- Don't be silent if inappropriate topics are discussed... do formally object.

**If you have questions,  
contact the IEEE Patent Committee Administrator  
at [patcom@ieee.org](mailto:patcom@ieee.org)**

Approved by IEEE-SA Standards Board – December 2002

# Interpretation Procedure

- <http://standards.ieee.org/reading/ieee/interp/>
- Send email to Linda Gargiulo  
([l.gargiulo@ieee.org](mailto:l.gargiulo@ieee.org))
- IEEE forwards requests to the WG
- WG responds

# Work Items

- Interpretation requests
  - Delayed CFP Beacon
- Andrew's accumulated list 382r7 – Problems with the 802.11 MAC standard and 802.11a PHY standard (mostly)
- Documents from Jon Rosdahl (other inputs)
  - 11-01-340r2-W-Errata list Justifies need for Corrigenda for 802.11
  - 11-02-091r0-W-Errata-list-for-802-11d-needs-corrigendum
  - 11-02-092r0-W-Scanning-process-requires-parameter-block-for-802-11a
  - 11-02-093r0-W-Errata-List-for-802-11a-needs-corrigendum
- Document supplied by Terry Cole (other inputs)
  - 11-03-199-W-Potential-WG-Editor-Errata
- 802.11F Association primitives
- Update informative text on regulatory information for 802.11a and 802.11b, provide table for 802.11d (collect in an appendix?)
- IBSS coalescence
- PCF
- Optional/mandatory match between text and PICS
- SDL (remove, improve, abstract), MSCs?
- Email Terry received during 2003 edition process
- Recommendation of phase-in for compliance



# Interpretation Requests

- Delayed CFP Beacon
  - When a CFP Beacon is delayed, is it sent after PIFS or some other access delay when the opportunity to transmit arrives?

# Interpretation Request

original line : In the case of a busy medium due to DCF traffic, the beacon shall be delayed for the time required to complete the current DCF frame exchange.

I think there is no direct answer about the following case.

Q : When a PCF beacon(CFPeriod=0, DTIM Count=0) is deferred due to a busy medium(DCF), PC shall use xxxxxxxxxxxx delay to start the CFP after this DCF medium busy.

A :

<1> served as normal DCF beacon, use DIFS+random backoff delay

<2> served as normal PCF beacon while not deferred by medium, use PIFS delay

# Interpretation Response

Clause 9.3.3.2 says, in part: “... the PC shall use a DIFS plus a random backoff delay (with CW in the range of 1 to aCWmin) to start a CFP when the initial beacon is delayed because of deferral due to a busy medium.” This is a clear statement that the Beacon is to be transmitted using a backoff after DIFS after the medium becomes idle.

This area of the standard is being modified by the work going on 802.11 Task Group e. You may be interested in following that work as it progresses.

# Motion to adopt 03-576

- Moved: That document 03-576r1 be adopted as the response to the interpretation request regarding delayed CFP Beacons.
- Moved: Andrew Myles
- Seconded: Terry Cole
- Vote: unanimous consent

# Motion to forward to WG

- Motion: to request the working group to accept and forward the interpretation response contained in document 03-576 to Linda Gargiulo at the IEEE office as the official response of the 802.11 working group.
- Moved: Andrew Myles
- Seconded: Dima Varsanofiev
- Vote: unanimous consent

# Review other inputs

- 03/382r7 – Andrew Myles

# Output Documents

- 574r0: This report
- 576r1: Interpretation Response 1-07/03
- 619r0: Status of Work Items
- 640r0: Minutes

# Motion to Adjourn

- Time for adjournment reached
- Meeting adjourned at 5:30pm



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**IEEE P802.11  
Wireless LANs**

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**Minutes of High Throughput Task Group Meetings**

**Date:** January 12-16, 2004

**Author:** Garth Hillman  
Advanced Micro Devices  
5204 East Ben White Blvd, Austin, TX 78741  
Mail Stop - PCS4  
Phone: (512) 602-7869  
Fax: (512) 602-5051  
e-Mail: garth.hillman@amd.com

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**Abstract**

Cumulative minutes of the High Throughput Task Group meetings held during the IEEE 802.11/15 Interim meeting in Vancouver from January 12 through 16, 2004.

**Executive Summary (see closing report doc. 11-04-0151r0):**

- 1. Received 24 Presentations; 20 presented in session and 4 presented in the sub-groups**
- 2. Bruce Kraemer was ‘chair-elect’ and took over mid-meeting for Matthew Shoemake who resigned**
- 3. Progress toward issuing ‘Call for Proposals’**
  - a. Channel model (03-940r2) was updated and remained adopted**
  - b. Usage Model/Simulation Scenarios (03-802r10) updated but not adopted**
  - c. Functional Requirements (03-0813r9) were not addressed and remained unadopted**
  - d. Most of the ‘non-presentation time’ was spent on Comparison Criteria (03-0814r13); major progress was made and most of the redundancy was eliminated and all CCs were addressed at least once; CCs were not adopted; teleconference calls will continue to be held bi-weekly**
  - e. New ‘MAC-PHY Interface’ ad-hoc committee to study how to represent the Phy when simulating the MAC was formed with Jeff Gilbert as chair and Colin Lanzl as secretary; teleconference calls will be held between now and March meeting with logistics to be put on reflector**
- 4. Goal for March meeting is to issue Call for Proposals**

Detailed minutes follow:

**Monday January 12; 4:00 –6:00 PM [~ 110 attendees at first meeting]**

:

1. Meeting was called to order by Task Group chairperson Matthew Shoemake at 4:10 PM
2. New participants in .11n ~20
3. Chair reviewed history and overview of process and objectives for the week for 802.11n [ doc. (04-027r1)]
  - a. Original schedules in [doc. 11-03/275r1a from SG (Jon Rosdahl) and doc 11-03-488r0 from TGn (Matthew Shoemake)]
  - b. Objectives for the week are to:
    - i. Complete Selection Criteria steps 1-5 namely
      1. Adopt Usage Model including changes to simulations scenarios
      2. Complete Functional Requirements (FR) and Comparison Criteria (CC) Special Committee Output document – Adrian Stephens
      3. Issue a “Call for Proposals”
    - ii. Elect in WG new Chair – Sean Coffey, Bruce Kraemer, Chris Hansen are current candidates
    - iii. Receive Presentations
4. Chairperson read IEEE Patent Policy from IEEE Standards Board
5. Chairperson noted inappropriate discussion topics while at the meeting
6. Chairperson asked for Patent intentions and none were identified
7. Tentative Agenda in doc. 11-04/-027r2
  - a. Approve minutes from Albuquerque
  - b. FRCC SC Report
  - c. Generate a list of presentations (note early Presentation requests due to travel constraints)
  - d. Schedule all presentations first which are related to FRCC
  - e. Complete FRCC report
  - f. Transition to new Chair
  - g. Adopt FRCC, FR and UM/SS documents
  - h. Issue Call for Proposals
  - i. Complete receiving presentations
8. **Motion to adopt agenda by Bruce Kraemer and seconded by George Vlantis passed (47,0,6)**
9. **Motion by Bruno Jechoux and seconded by ? to amend agenda to allow motions during the discussion of the FRCC (to deal with Simulation Scenario to address MAC-PHY interface simulation) passed unanimously**
10. **Motion to approve minutes from Albuquerque meeting (11-03-831r1) by Colin Lanzl and seconded by George Vlantis passed unanimously**
11. FRCC Report (11-03-039r0) by Adrian

- a. Cumulative minutes (11-03-815)
  - b. UM and Sim scenarios (11-03-802)
  - c. FR (11-03-813r6) tabled at last session
  - d. CC (11-03-814r8) is current version
    - i. 80 CCs total
    - ii. only 6 approved in teleconferences!!!!
      - 1. Solution divide and conquer
      - 2. Will propose 4 groups to reduce/consolidate CCs
      - 3. And One group to fix simulation scenarios
  - e. Discussion
    - i. Large number of duplications
    - ii. As long as the CC is unambiguous and simple to simulate then they can be kept
    - iii. The CCs which require involved simulations are problematic
    - iv. There will be an ad hoc session (Jeff Gilbert) to discuss simulations and the need for a mandatory MAC-PHY interface
12. Procedural – there have been some editorial changes to the Channel Model document ( by Venko; how to handle?)
13. Answer by Chair and supported by TG – identify changes and ask for acceptance without objection since they were editorial
14. Identification of presentations related only to FRCC
- a. [30 min.] Short Training Sequence; 04-002-r2 – Rosdahl (change and improvement)
  - b. [15] 04-0046-01; Aoki
  - c. [15] Sensitivity performance; 04-0049r1; Takeda
  - d. [15] 04-0015r0; Choi
  - e. [0] Throughput vs range; 04-0040r0 in ad hoc
  - f. [25] 04-0077r0; Skafivas
  - g. [15] 04-0033r0; Inoue
  - h. [0] P2P Sim Scenarios; 04-0078r0; Bjerke in ad hoc
  - i. [30] Phy Abstraction for MAC Simulation; no number assigned yet; Jechoux
  - j. [0] Time Correlated Packet Errors; 04-0064r0; Vlantis in ad hoc
  - k. [0] Proposal for Statistical Channel Error Model; 04-0012r1; George Vlantis in ad hoc sessions
15. Identification of presentations NOT related only to FRCC
- a. [30] Practical MIMO; 03-0999r0; Moon (Tuesday or Wednesday)
  - b. [20] 04-0060r0; Chris Hansen
  - c. [20] 04-0014r0; Tem Brink
  - d. [35] 04-0016r2; Choi
  - e. [20] Parallel Sequence Spread Spectrum; 04-0076r0; wolf (Tuesday or Wednesday)
  - f. [25] LDPC vs Convolutional Codes; 04-0071r0; Purkovic

- g. [15] Low Overhead Structures; 04-0020r0; Falkner
  - h. [12] 04-0003r0; Edmonston
  - i. [5] TGn Channel Models 03-940r2 – Lanzl
  - j. [20] Pros&Cons; 04-0075r0
  - k. [15] Performance of RS Codes in MIMO; TBD; Pen Li
16. FRCC Presentations:
17. Presentation #1 (doc 11-04-002r2) Considerations for Short Training Sequence (STS) for MIMO-OFDM; Nakao, Sanyo but presented by Jon Rosdahl
- a. Normalize STS power to typically = data signal power for good AGC training
  - b. Cross Correlation should go to zero in one STS for 2x2 MIMO from TX1 and TX2
  - c. STS must be simultaneous to train MIMO receiver
  - d. New STS is necessary
  - e. Each TX antenna should have a unique STS
  - f. *STS should be included in the CC*
  - g. Discussion
    - i. FRCC request for NO new CC was rescinded and replaced by “have your new CC ready for the FRCC ad hoc sessions”
18. Session recessed at 6:00 and will reconvene at 7:30 PM

**Monday 1-12-04; 7:30 – 9:30 PM**

19. Session reconvened at 7:40 PM
20. Presentation #2; 04-0046r1; New Preamble Structure for AGC in a MIMO-OFDM System; Aoki; Toshiba
- a. New short preamble offers improved AGC resulting in improved BER
  - b. Discussion
    - i. Was detection based on hard decisions? A = yes
21. Presentation #3; 11-04-0049r1; Sensitivity Performance to Antenna Element Spacing; Daisuke Takeda; Toshiba
- a. Avoid spatial correlation effect
  - b. Not as sensitive when Angular Spread (AS) is large
  - c. Improvement increases with # antennas
  - d. Improvement increases with data rate
  - e. *Concludes that CC must specify antenna spacing*
  - f. Discussion:
    - i. Did you consider the case where TX antennas and Rx antennas had different spacings? A = no
22. Presentation #4; 11-04-0015r2; Comments on Ergodic and Outage Capacity; Yang-Seok Choi; Vivato
23. Presentation #5; 11-04-0077r0; Capacity of MIMO Systems as a Function of Antenna Parameters; Skafidas ; Bandspeed

- a. Factors
  - i. Antenna Coupling (on PCB for example)
  - ii. Fading channel correlation coeff
  - iii. What if Ricean channel (LOS component and large K-factor) instead of Rayleigh?
  - iv. Impact of Angle of Arrival (AOA)
  - v. Concludes – need to spec minimum antenna spacing and far field antenna Pattern Mask
  - vi. Discussion:
    - 1. How is AOA defined?  $A = \text{AOA wrt normal of antenna array}$
    - 2. Intended as guide to show effects of coupling and spacing
    - 3. Antenna coupling will also affect TX as well as RX
    - 4. *Bring new CC for Phy Layer ad hoc committee*
- 24. Presentation #6; 11-04-0033r1; Japanese Frequency Regulation Related to TGn Functional Requirements; Inuoe; NTT
  - a. Conclusion – *do not consider bandwidths > 20 MHz for .11n*
  - b. Discussion
    - i. At WRC WLAN 5 GHz bands were harmonized and greater than indicated in the presentation
- 25. Submissions not related to FRCC now considered
- 26. Presentation #7; 11-04-0075r1; Advantages and Drawbacks of Circular Delay Diversity for MIMO-OFDM; H. Sampath; Marvell Semi
  - a. Advantage of Delay Diversity – in NLOS fading channels scales as # antennas and it is backward compatible
  - b. Disadvantage Delay Diversity – in high K-factor channels, performance can actually be decreased
  - c. Recommends – for high K-factor channels use low  $t_k$
  - d. Discussion – no questions
- 28. Presentation #8; 11-04-0060r1; Thoughts on Spectral Masks for .11n ; Chris Hansen; Broadcom
  - a. Issue is Adjacent Channel Interference ACI
  - b. ACI determines SNR so it is important
  - c. Additional constraints on Inter-modulation Distortion (IMD) is desirable
  - d. Suggested masks
  - e. Conclusion – *reduce PSD mask noise floor; 40 MHz channel is compatible with legacy 20 MHz channels*
  - f. Discussion
    - i. MIMO takes advantage of fine structure of channel; have you considered this? A – no
- 29. Presentation #9; 11-03-0940r2; TGn Channel Models; Colin Lanzl; Aware
  - a. Editorial changes included:
    - i. Figures 7 and 8 were updated
    - ii. 10 lines added at the end of Sec. 4.1 about K-factor simulation
    - iii. 8 lines added at the end of Sec. 4.5.1 about AP height dependency
  - b. Changes were accepted without objection

30. Session was recessed at 9:32 PM until 8:00 AM tomorrow

**Tuesday, 1-13-04; 10:30 – 12:30 PM**

1. Session was called to order by Chair at 10:34 AM
2. No additional FRCC presentation slots were requested
3. New non-FRCC presentation - [15] Effective Training Sequence for .11n, Tung,
4. Adrian Stephens described goals, process and logistics for the FRCC ad hoc meetings (doc. 11-04-0038r0)
5. Tentative FRCC Agenda
  - a. Appoint secretary
  - b. Review & Discuss Strategy (break-up into sub-groups to address in parallel the CC's associated with particular topics)
  - c. Agree logistics for the group meetings
  - d. Identify volunteers and lead for each group (also chair SS group?)
  - e. Split into ad-hoc groups until work substantially complete
    - i. Verbal status report to full FRCC at the start of each time slot
  - f. Editorial merge of CC's from groups
  - g. Revised CC document with changes from Group Representatives put on server
  - h. ... (4 hours meeting time elapses to meet IEEE rules) ...
  - i. Motions to adopt documents
6. Agenda was accepted.
7. Garth Hillman (was!) volunteered as secretary ☺
8. Logistics – 4 sub-groups in this room;
  - a. Mary Cramer sections 4.1, 4.2 (left front); marketing/general
  - b. John Ketchum sections 4.3, 4.5.3 (right back); Coexistence
  - c. Sanjiv Nanda sections 4.4, 4.5 except 4.5.3 (left back); MAC
  - d. Jeff Gilbert section 4.6 (right front); Phy
  - e. Adrian Stephens volunteered to lead Simulation Scenarios (3 volunteers)
9. Recessed at 10:52 to break into sub-groups.
10. The new CCs from the sub-groups will be their minutes and each sub-group will not have a separate secretary.
11. Session adjourned at 12:32 PM

**Tuesday 1-13-04; 1:30-3:30 PM**

12. Session reconvened at 1:39 PM
13. Sub-group verbal status reports:
  - a. Marie Cramer – looking good; one more session; will need help from MAC team

- b. John Ketchum – 65% progress; 2 additional sessions; one CC will require a change in the simulation scenarios
  - c. Sanjiv Nanda – throughput vs range (TP vs R) still to be tackled from MAC viewpoint so probably need two more sessions
  - d. Jeff Gilbert – completed 5 out of 12 so needs at least 2 additional sessions since TP vs R remains!
14. Recess for sub-groups at 1:51 PM
15. Sub-groups recessed at 3:30 PM

**Tuesday 1-13-04; 4:00-6:00 PM**

16. Session reconvened by Chair at 4:06 PM
17. Sub-group verbal status reports:
- a. Marie Cramer – marketing complete
  - b. John Ketchum – complete and includes 3 new simulation scenarios
  - c. Sanjiv Nanda – usage models and encoding complete; Throughput vs range will still need two sessions
  - d. Jeff Gilbert – needs two more sessions still as they too are on rate vs range; the tough ones!
18. Recess for sub-groups at 4:15 PM
19. Sub-groups recessed at 6:00 PM

**Tuesday 1-13-04; 7:30 – 9:30 PM**

20. Session reconvened by chair at 7:38 PM
21. Sub-group verbal status reports:
- a. Sanjiv Nanda, MAC – should finish except for some loose ends by the end of this session.
  - b. Jeff Gilbert – 2 of 4 impairments solidified; range – rate TBD; estimates still two more sessions
22. Adrain Stephens reported Comparison Criteria from Mary and John have been merged in 11-04-814r10
23. Usage model/simulation scenarios have been updated in 11-04-802r8
24. Three additional simulation scenarios will be merged by Adrain and included in 11-04-802r9
25. Meeting recessed until 8 AM tomorrow morning and broke into two remaining ad-hoc sub-groups at 7:46 PM

**Wednesday 1-14-04; 8:00-10:00 AM**

- 1. Session was reconvened at 8:07 AM
- 2. Sean Coffey announced he was withdrawing from the election
- 3. Sign-in problems with attendance server
- 4. Will break back into sub-groups after reports
- 5. Sub-committee reports:

- a. Sanjiv Nanda – MAC progress – 28 at start yesterday; 5 finished; 18 deleted; 5 open – 2 to clean-up and 3 potentially deleted; will wrap up this morning
- b. Jeff Gilbert – 1 major done, 1 open; 2 to touch up; 10 minor to complete
6. Goal oriented Agenda going forward!!
  - a. Finish during this slot
  - b. Merge and put on server for 2 time slots
  - c. Finish Presentations
  - d. Vote on documents
  - e. Call for Proposals
7. Recessed for sub-groups at 8:18 AM
8. Last sub-group, PHY, recessed at 10:06 PM

**Wednesday 1-14-04; 1:30-3:30 PM**

9. Session was reconvened by chair at 1:34 PM
10. Results of Election held in the mid-week WG Plenary were announced; Bruce Kraemer was chair elect
11. The Chairperson transition from Matthew Shoemake to Bruce Kraemer transpired
12. Bruce made introductory remarks
  - a. Dictionary Definition of commitment #1 official act to confine someone to a mental hospital or prison or #2 to be steadfast and tied to a specific agenda – Bruce said he would adopt #2!
13. John Kowalski made a presentation (11-04-104r0) on the preferred approach to co-operation and agreeing on CCs
14. Adrian asked each sub-group leader to review their CC and this was captured real time in (11-04-814r11)
15. In summary the changes were:
  - a. John Ketchum – reviewed changes to CC related to Coexistence 4.3
    - i. Added definitions for backwards compatibility and interoperability (B&I)
    - ii. Added priorities
    - iii. Combined CC#11&12 into CC#11 B&I
    - iv. CC#15 re: sharing medium for legacy devices was dealt with in relation to section 4.5.3
    - v. HTAP-HTSTA-LSTA simulation scenarios created
    - vi. CC#17 SAP compatibility reporting was deleted by straw poll (~27,~8) by the body as a whole
  - b. John Ketchum – reviewed changes to CC related to Coexistence 4.5.3
    - i. MAC compatibility and interoperability CC#11 tweaked
    - ii. MAC extension descriptions added as CC#15
    - iii. Encryption Impacts on secured and unsecured traffic CC#?
  - c. Sanjiv Nanda - reviewed changes to CC related to MAC 4.4
    - i. Significantly reduced the number



- ii. In simulation scenarios goodput is defined and measured
- iii. CC#19; QoS flows – defined packet loss rate metric
- iv. CC#20; aggregate goodput; three metrics defined
- v. CC#24; important; MAC efficiency was defined as Goodput divided by average PHY data rate
- vi. CC#25; scalability; how do MAC data rates scale with PHY rates
- vii. CC#27&28; Throughput versus range; #27 (BW unspecified); #28 (BW for 20 MHz)
- viii. TP vs Range must be specified for all PHY rates
- ix. Discussion:
  - 1. MAC efficiency – delete and replace with MAC-SAP rate?
  - 2. Let's not make changes to the document without additional time for the body to consider
  - 3. Chair rescinded the decision to delete CC#17
  - 4. CC#27 – re: TP vs R for EACH phy rate; how can it be done when the rate selection mechanism changes automatically
- d. Mary Cramer - reviewed changes to CCs related to Marketing, sections 4.1, 4.2
  - i. Combined CC#1&2 into CC#2
  - ii. CC#3 reworded but same intent
  - iii. CC#4 reworded but same intent
  - iv. CC#5&6 combined into CC#6
  - v. CC#9&10 on power consumption combined into CC#10
  - vi. Active RX power was defined relative .11a
  - vii. Goodput versus range considered important
  - viii. Only 6 were retained
  - ix. Discussion
    - 1. Cost metric is concerning even though it is relative
    - 2. Chair ruled IPR should not be considered
- e. Jeff reviewed changes to CC related to PHY, section 4.5
  - i. Started with 12 and reduced to 8
  - ii. Data rates – straightforward
  - iii. Preamble CC#42 – deadlocked; proposed text for two options to straw poll on
  - iv. Added Option#3 based on incomplete #1 and TG asked for abstentions to be counted
    - 1. Option #1 – These analyses should be conducted on the transmit waveforms independent of any channel mode (19)
    - 2. Option #2 – Cross-correlation specified as above (no channel) But autocorrelation analysis should be performed for extreme channel NLOS E and LOS B representing extreme types of channels to avoid poor synchronization in some scenarios. Metric required is the mean and std of peak to side lobe ratio of the autocorrelation function. (18)

- 3. Option #3 – These analyses should be conducted on the transmit waveforms independent of any channel mode. Metric required for autocorrelation is the mean and std of peak to side lobe ratio of the autocorrelation function. (9)
  - 4. Abstentions - (22)
  - v. Eliminated Option#3 and Revote between:
    - 1. Option #1 (34)
    - 2. Option #2 (23)
    - 3. Abstentions (21)
  - vi. CC#51.5 channelization – small clarification
  - vii. CC#52 Channel mask – small clarification
  - viii. CC#58 Efficiency – small clarification
  - ix. CC#59, CC#67 – spent majority of time here on TP vs R
    - 1. AWGN channels
    - 2. non-AWNG channels
    - 3. Add statement at end regarding proposals having fewer than 5 data rates
    - 4. added –10 dB constraint on the first SNR to make both definitions the same
  - f. CC#67 straw poll to determine Package Error Rate threshold value; results were:
    - i. 1% (47)
    - ii. 4% (11)
    - iii. 10% (2)
  - g. Impairments section
    - i. PA nonlinearity
    - ii. Straw poll – do we need specifying what the total output power will be (12 to add, 3 not)
    - iii. Carrier frequency offset
    - iv. Phase noise values for PSD(-100 at DC, .....)
    - v. Noise Figure
    - vi. Discussion:
      - 1. What is antenna gain? A – see channel models
16. Adrian showed changes to the simulation scenarios
- a. Rev 10 added P2P simulation
  - b. Shadowing – minor change to usage models; set to 0 dB; read footnote
  - c. Scenario #4 – reuse factor made explicit
  - d. #5 two stations were coincident and this was fixed
  - e. #11 not added after all
  - f. #16 P2Pt model added
  - g. #17,18,19 – goodput tests added

- h. Discussion:
  - i. #16 – which MSDU size did we end up with? A – 1500 but suggestion was that 64 B would be better
  - ii. Straw poll – one packet size (30) or a set of packet sizes (13)
  - iii. Straw poll – 1500? (33), Other? (5)
  - iv. Process after docs are on server – only changes which are fundamentally wrong should be debated in the interest of time
- 17. **Chair ruled that for this exercise CCs are procedural hence 50% majority and only wanted voting members to vote in order to get a sense of how the final vote will turn out**
- 18. Return to non-FRCC Presentations
- 19. Presentation #10; (11-04-0111r0); Parallel Sequence Spread Spectrum; Dr. Andreas Wolf in conjunction with the University of Applied Science in Berlin
  - a. New modulation scheme (not described in detail) but
    - i. Significantly reduced gate county
    - ii. Significantly spectral efficiency improvement
    - iii. Significantly less complex
    - iv. Significantly reduced ADC/DAC requirements
    - v. Not OFDM
- 20. Meeting was recessed by chair at 3:28 PM until 4:00 PM

**Wednesday 1-14-04; 4:00 –6:00 PM**

- 21. Presentation #11; (11-04-087r0); Effective Training Sequence; Tung; Ralink Technology
  - a. Backwards compatible with .11a
  - b. Suitable for MIMO
- 22. Presentation #12; (11-04-071r1); LDPC (Low Delay Parity Check) vs Convolutional Codes for 802.11n Applications: Performance Comparison; Aleksandar Purkovic; Nortel Networks
  - a. Compared Convolutional, LDPC codes for FEC
  - b. Compared over AWGN and Channel D channel models
  - c. LDPC embeds interleaving
  - d. LDPC should be seriously considered
  - e. Implementation Complexity needs to be assessed
  - f. Questions: how did LDPC compare with Turbo Codes? A - TBD
- 23. Presentation #13; (11-04-014r1); Different Channel Coding Options; Ten Brink; Realtek Semi
  - a. Simulation environment based on .11a
  - b. Channel codes investigated – convolution, LDPC (low density parity check codes), parallel concatenated code (turbo code), serially concatenated code,

- c. 1000B and 10000B packets
  - d. AWGN and fading channels favour different codes
  - e. Concludes – 1-4 dB gain possible through concatenated coding with iterative decoding;
  - f. Feedback schemes – yes it makes sense but should not be mandatory
24. Presentation #14; (11-04-0999r2); Practical MIMO Architecture Enabling Very High Data Rates; Moon; Un. Minnesota
- a. Space Time Coding must use high order modulation
  - b. Spatial Multiplexing (SM) should be considered
  - c. LDPC, Turbo, CC with IDD (Iterative Demapping Decoding)
  - d. Convolutional Code (CC) with IDD performs as well as Turbo or LDPC
  - e. Automatic backward compatibility
  - f. Spatial Multiplexing offers natural way of going to MIMO system
  - g. Discussion
    - i. Latency? A - No additional latency due to SM
25. Presentation #15; (11-04-020r0); Low Overhead Pilot Structures; Mike Falkner; Victoria University (used secretary's PC for projection)
26. Presentation #16; (11-04-096r0); Use of Reed-Solomon for 802.11n; Pen Li; Philips Semi
27. Recessed by Chair at 5:58 PM until tomorrow at 8:00AM

**Thursday 1-15-04; 8:00-10:00AM**

1. Meeting was reconvened by Chair at 8:04 AM
2. Adrian proposed an agenda for the last 4 hours of the day (11-04-039r2) as follows:
  - a. At 8:00am, move to modify the TGn agenda to start this process at 10:30 (special orders)
  - b. At 10:30 Invite all major objections to the FR, CC and SS to be declared in the TGn session and listed real time
  - c. Then, move to limit debate on each item to x (TBD) minutes such that the total debate for the objections is limited to 2 hours
  - d. Then, work through list of objections and edit documents real-time in front of TGn
  - e. Then, move to adopt UM, FR, CC documents on completion of edits
  - f. Then, move to adopt Call For Proposal document
  - g. Then, Plan activities for Orlando Meeting (March 2004)
4. Chair noted that a change in Agenda and limiting of debate requires a 2/3 majority
5. Any objection to proposed new agenda? Yes
6. Discussion:
  - a. Does this plan cover all documents or just discussion of CC in 10:30 slot? A- only CC in 10:30 slot but FR, UM/SS can be approved in this morning's session
  - b. Item 'c' may be too restrictive

7. **Motion by Adrian to adopt new agenda minus item 'c' was seconded by Colin Lanzl passed (23,0,10)**
8. Let's finish presentations this morning then del with documents
9. Presentation #17; (11-04-003r0); Turbo Codes in IEEE 802.11n; Brian Edmonston; iCoding Technology and France Telecom
  - a. Turbo codes (TC) – soft iterative coding
  - b. Duo-Binary CTC (Circular TC)
  - c. Compatible with modulation schemes
  - d. Less complex than any LDPC
  - e. Power = iterations x memory so, since TC requires low memory it is power efficient
  - f. Latency – Can be parallelized to keep latency low
  - g. Conclusion – consider Turbo Codes
  - h. Discussion – more analysis on latency and block sizes
10. Presentation #18; (11-016-0r3); Layered Processing for OFDM; YS Choi; Vivato
  - a. Consider parallel encoding
  - b. Layered Processing
  - c. Concludes – use Serial Processing at TX and Layer Processing at the RX
  - d. Discussion: none
11. Presentation #19; (11-04-136r0); ; iMEC; Frederik Petre
  - a. Need to understand indoor communication channel
  - b. ISI mitigation
  - c. Angular Dispersion
  - d. Delay Dispersion
  - e. Strong spatial and frequency dependency at antennas
  - f. SDM (Space Div Mux) – Complex TX which requires Channel State Information (CSI)
  - g. Or, RX which does not require CSI but is very complex
  - h. Space Time Coding is a good compromise
  - i. Why be sceptical about MIMO
  - j. Complexity manageable?
  - k. Can it achieve Rate and Range and Power goals
  - l. Need smart MIMO scheme that *adapts* to needs and channels
  - m. Adaptively chooses Space Div Mux, Space Time Block Coding, Space Div Multiple Access
  - n. MIMO is actually power efficient wrt SISO at a given data rate
12. Presentation #20; (11-04-120r2); Physical Layer Abstractions to be used in MAC Simulations; Mitsubishi; Bruno Jechoux
  - a. Straw Poll #1 - Do we want a unified way of modelling PHY error rate in MAC/System simulation? (85,12)
  - b. Straw Poll #2 - When must this be completed by?
    - i. By the time of the call for proposals
    - ii. By the session following the call for proposals

- iii. The call for proposals should not be issued until this completes (by next session latest)
- 13. Orders of the Day prohibited the last Straw Poll from being taken

**Thursday 1-15-04; 10:30-12:30PM**

- 14. Bruno requested that the agenda be modified to complete the Straw Poll passed (58,2)
- 15. Motion to add 15 minutes to the start of the previous agenda by Bruno Jechoux as follows - At 10:45 – 11:00 discuss simulation methodologies - was seconded by John Kowalski**
  - a. Discussion:
    - i. Against - not now as the issue will come up naturally
    - ii. For – now as it will clarify the discussion of the CCs
  - b. Motion to modify agenda passed (52,5,3)**
- 16. Bruno (doc 11-04-120r2) returned to Straw Poll#2
  - a. Should the call for proposals be issued prior to finish addressing the Phy layer abstraction issue? (Y-5, N-47)
  - b. Chair ruled that only voting members vote to get a sense of a motion should it be made**
- 17. Bruno (doc 11-04-120r2) returned to Straw Poll#3
  - a. What is the latest completion date that is tolerable for this work?
    - i. By the end of the March session (8)
    - ii. Bt the end of the session following, i.e., the May session (19)
- 18. Returned to the discussion of the CCs and SSs; Adrian Stephens moderated
  - a. Collect issues
    - i. Editorial – deal with off line
    - ii. Technical – start now with the following ‘thumb nail’ descriptions of issues identified by the TG body
      - 1. IM1 or IM4 numbers were not agreed to
      - 2. CC59 and 67 involving Rate – Range are overly constraining
      - 3. CC42 – not needed
      - 4. CC28 – too restrictive unnecessary
      - 5. CC24 – unnecessary
      - 6. CC25 – constrains proposals
      - 7. CC24 – incorrectly spec’d and unnecessary
      - 8. CC25 – cannot be achieved
      - 9. CC42 – not needed wrt fnc req’t
      - 10. CC26 – reintroduce it
      - 11. CC25 – how can it be done
      - 12. CC59 – imprecisely defined
      - 13. IM4 – thought single poll and single zero with coeff but not sure

- 14. CC67 – overly restrictive
- 15. CC27,28 – overly restrictive
- 16. CC20, 27, 28 – not clear on how to interface phy to MAC (ref previous straw poll)
- 17. SS16 – why spec a mean rate of 400 Mbps
- 18. CC9 – power estimate not realistic
- 19. CC18 – too hard to spec correctly
- 20. Section 1.2 of CC doc – discuss the deleted line
- 21. IM2 – unclear on how to apply random offset
- 22. CC52 – unclear Spectral Mask/PA model
- 23. IM4 – more discussion
- 24. CC46,47 – unnecessary
- 25. CC4 – should a cost metric be included
- b. Unique items = 22; so that 120 min divided by 22  $\approx$  5 minutes per item
- c. Should we start with a straw poll to eliminate?
- 19. Motion to limit debate to max of 5 min per FR,CC and SS item or document section by Adrian Stephens and seconded by John Kowalski**
  - a. Motion to call the question by Chris Hansen and seconded by John Kowalski passed (33,0)
- 20. Main motion to limit debate failed (12,31)**
- 21. Adrian lead unlimited debate/straw polls on 11-04-814r12 with the goal of fixing document to reduce potential No votes
  - a. Section 1.2 Straw Poll (SP) – keep line struck out (10)
  - b. Section 1.2 SP- reintroduce and edit (10)
    - i. Motion to leave TBD sentence struck out in section 1.2 moved by Jon Rosdahl and seconded by Colin Lanzl**
    - ii. Discussion
      - 1. Against – editing was too hasty
      - 2. For – redundant
    - iii. Any objection to calling the question – NONE
    - iv. Motion passes (29,0,9)**
  - c. CC17 was wrongly deleted from 11-04-814r11
    - i. Motion to leave CC17 struck out by Colin Lanzl and seconded by Jon Rosdahl**
    - ii. Debate
      - 1. Against – MAC SAP cannot be changed per the PAR
    - iii. Motion passes (13, 2,11)**
  - d. CC9
    - i. Motion to delete CC9 by Srikanth and seconded by Colin Lanzl**
    - ii. Motion by John Kowalski to table was not seconded

- iii. Discussion:
  - 1. Against – power consumption critical for hand held devices
- iv. **Motion to amend motion to delete only bullet #2 of CC9 by Eric Jacobsen and seconded by John Kowalski**
  - 1. Discussion:
    - a. Against – info is too important to omit
- v. Question called by Colin Lanzl and seconded by John Kowalski passed without objection
- vi. **Motion to amend to delete only bullet #2 passes (21,10,21)**
- vii. **Motion to amend CC9 to read “estimate the total active receive power consumption” by Colin Lanzl and seconded by Eric Jacobsen**
- viii. Discussion:
  - 1. Against – just a guess
  - 2. For – rather have this than nothing
  - 3. Against – existing devices cannot be estimated accurately
- ix. **Motion to amend fails (6,41,4)**
- x. Return to main motion to delete CC9
- xi. Motion to Call question by John Kowalski seconded by Shrikanth passed without objection
- xii. **Main motion passed (31,13,14)**
- e. CC20
  - i. Clarification – without method being defined there would be too much variability due simulation differences
  - ii. **Motion by Bruno Jechoux and seconded George Vlantis to create an ad hoc committee to handle simulation methodology issues to produce a clearly defined interface between MAC and PHY to be used for system simulations**
    - 1. Debate
      - a. Reference this committee in CC20
      - b. Motion to amend to add “and delay further discussion on CC20 until the March session” by ? and seconded by ?
      - c. Motion to call the question by John Kowalski was not seconded
      - d. Friendly amendment to change ‘discussion’ to ‘disposition’
      - e. Motion to amend with friendly amendment passes (23,15,12)

22. Orders of the day

23. Session recessed until 1:30 PM this afternoon.

**Thursday 1-15-04; 1:30 – 3:30 PM**

24. Session was reconvened at 1:31 PM



25. Would use one more hour on CCs and then devote rest of meeting on developing the agenda for the March meeting and process time line using CFP from November meeting as starting line
- i. Discussion of CC20 motion on the floor resumed
    1. Against based on the fact that the interface is already normative
  - ii. **Motion passes (27,3,2)**
26. Call for volunteer for Chair of “MAC-PHY interface definition for simulations” ad hoc – Jeff Gilbert
27. Call for volunteer for secretary of ad hoc - Colin Lanzl
28. Return to CCs
- a. CC#24
    - i. **Move to remove CC24 by John Kowalski and seconded by Colin Lanzl**
    - ii. Discussion:
      1. Would Sanjiv’s MAC group like to justify this CC?
      2. Sanjiv for – strong feeling to keep MAC efficiency in the CC although took a while to define; by knowing what the MAC efficiency is the PHY efficiency can be determined
      3. Motion to call the question by Jeff Gilbert and seconded by Colin Lanzl passed without objection
      4. **Main motion fails (14,17,11)**
  - b. CC#25
    - i. **Move to remove CC25 by John Kowalski and seconded by Eldad Parahia**
    - ii. Discussion:
      1. For – which Phy?
      2. Against – our proposal should look to the future
      3. Against – need analysis on how it will scale
      4. For – you can always add an analysis in your proposal
      5. Intent – a COMPLETE proposal must fill in ALL entries in the CC matrix, Partial proposals do not need to fill in ALL elements and, for that matter any of the CCs
      6. Reviewed the definition of Complete and Partial proposals
      7. It is correct that the current CC does not distinguish between mandatory and optional CCs? A = yes
      8. *Note – Partial proposals are eliminated at the end of the 1<sup>st</sup> round if they do not merge*
    - iii. Colin called the question and seconded by Eldad Parahia passed without objection
    - iv. **Main Motion passed (35,6,7)**
  - c. **Motion by Colin Lanzl that “we should mark all CCs as mandatory in CC document 11-04-814” was seconded by Adrian**
    - i. Discussion
      1. Let’s delay dealing with this issue
      2. What is point of an optional CC? A – simply a convenience
      3. For – does reflect the will of the FRCC committee

**4. Motion to table by John Kowalski and seconded by Steve Halford passed (26,10,9)**

## d. CC#26

## i. Discussion

1. Sanjiv – in group not strong support
2. Straw poll – add CC26 back into CC document failed (2,26)
3. Decision is that CC26 shall remain deleted

## e. CC#27

## i. Discussion

1. Issue is “at each Phy rate” phrase

**ii. Motion by John Kowalski to remove “at each Phy rate” from CC27 was seconded by Colin Lanzl**

## 1. Discussion:

- a. One of the primary metrics of interest is the TP at top of MAC
- b. Should we be using the Channel models? A – yes
- c. Against none

**d. Motion passed (20,6,10)**

## f. CC#28

## i. Discussion:

1. Why not treat same as CC27 and it is removed
2. Why was 20 MHz stated? A – Japanese market

## g. CC#4

## i. Discussion

1. Was ‘cost’ issue resolved? A – did so in .11g so it is OK
2. Is ‘cost’ metric clear?

**ii. Motion to remove CC#4 by Mary Cramer and seconded by Eldad Parahia**

## 1. Discussion

- a. Against – cost is not the issue price is
- b. For – too controversial
- c. Motion passed (22,7,20)

## 29. Meeting turned to a discussion of setting items for March meeting

## a. Timeline

- i. If CFP March 9
- ii. Then 3 month delta says Proposals will be heard in July
- iii. Recall proposals must be on the server 30 days prior to presentation
- iv. How can we decide given that CCs have not been agreed upon?
- v. Assume CFP is given in March
- vi. Wait until March to make a decision

- vii. Most optimistic schedule for Proposals – May 2004
    - viii. Most likely schedule for Proposals – July 2004
  - b. Plan for March
    - i. Ad hoc simulation committee report now that it has a chair and secretary
    - ii. Adopt remaining CCs, FRs
    - iii. Issue CFPs
- 30. Clarification – Simulation Methodology Special Committee Scope?
  - a. Scope#1 – to define a mandatory MAC-PHY interface that *shall* be used in all MAC simulations generating results reported in the CC matrix or
  - b. Scope #2 – To recommend methodology that *may* be used by complete or partial proposals to aid in the generation of results to be reported to the CC matrix or
  - c. Scope#3 – to define a PHY-MAC interface that *shall* be used in MAC simulations generating results reported in the CC matrix and vote upon completion as to whether it should be mandatory or optional
    - i. Discussion
      - 1. Making anything mandatory is dangerous
      - 2. We must limit the time frame for the work of this committee; committee holds entire TG hostage; must set an expiration date at end of March
  - d. Straw Poll - Scope#1 ( 5)Scope#2 (12) Scope#3 (31)
  - e. Friendly amendment to Scope #3 to change “that shall” to “to be” was accepted unanimously.
  - f. **Motion by Colin and seconded by John Kowalski to adopt #3 as amended as the statement of work for the special committee scope passed (32,3,6)**
  - g. **Motion by John Kowalaski and seconded by Jeff Gilbert “Term of ad hoc would terminate in March session unless renewed at the end of the March session” passed (38,0,3)**
  - h. Contact Jeff at [gilbertj@atheros.com](mailto:gilbertj@atheros.com) for participation/comments on MAC-PHY Interface Simulation
- 31. Remember to use the reflector for openness
- 32. Meeting was adjourned at 3:30 PM until meeting in March in Orlando!!!

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**IEEE P802.11  
Wireless LANs**

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**Minutes of WAVE Study Group**

**Date:** Vancouver, January 14 - 15, 2004

**Author:** Filip Weytjens  
Transcore  
Filip.weytjens@transcore.com

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**Wednesday, January 14, 2004 1:30PM Session**

Lee Armstrong (Armstrong consulting), chair of WAVE study group, started the meeting by going over the policies and rules. He also addressed the standard statements and patents applicable to IEEE 802.11 study groups.

He presented the agenda and described each item on it. The agenda was approved by the group.

Lee described the objectives as bringing everybody up to speed on decision that were made in the past during ASTM meetings. It was mentioned that an editorial change had to be made to the PAR.

The minutes of the Albuquerque WAVE study group were approved.

Lee discussed the overall program status by presenting an overall planning including standards development and maintenance, testing, prototyping, demonstrations, and production. He then discussed the major participating organizations (ASTM, IEEE, ISO, CALM, TC204 SWG16, SAE, ITS-A, VSCC (car manufacturers), Omni-Air).

Broady Cash (ARINC) presented the status and impact of FCC rule making on WAVE and specifics on the characteristics of the physical layer. He then discussed the applications that were allowed by the FCC. He pointed out that the FCC required the applications to be transportation related. Following on the applications, the user requirements were presented including the derived requirements and the use and structure of the band plan. Broady demonstrated the use of WAVE by presenting how it could be used to avoid collision avoidance.

At 3:30PM we had a 30 min break.

**Wednesday, January 14, 2004 4:00PM Session**

After the break, Lee started by discussing the ASTM architecture that is under standardization and how this architecture relates to the ISO architecture. He mentioned that the MAC layer and the PHY layer were based on 802.11,a and was called the ASTM 2213-3 standard. The layers above the ASTM 2213-3 were not addressed by the WAVE study group as these layers were standardized in another IEEE group called IEEE 1609. Lee then followed with describing the different ways it could be used in a car.

Broady gave an overview of the simulations, analysis, and tests that would be presented on Thursday.

The meeting was adjourned at 4:45PM.

**Thursday, January 15, 2004 8:00AM Session**

Lee Armstrong (Armstrong Consulting) opened the meeting at 8:00AM.

Prof. Mary Ann Ingram (Georgia Tech) was introduced. She presented the work that was going on at Georgia Tech addressing channel characterisation for WAVE communication. Based on literature survey she discussed a model that was in use today including the test parameters and worst case parameters. She addressed both road side to vehicle and vehicle to vehicle communication. After an overview of the literature study, she discussed the channel measurements (doppler) as performed at Georgia tech. The measurements were compared to a simulink model. Also

a comparison was made between 802.11b/g and DSRC based on a 2path study. An overview was given how the different channel parameters/Doppler characteristics influenced the throughput of a Linksys IEEE 802.11b card. She closed with an overview of the next steps and proposed several methods that could be used for future channel emulation.

It was mentioned that the document number of Marry's document was not the right number. The reason for this was that this document was too big (10MB) to be uploaded with the automated service that was available through the 802wirelessworld website. The document needs to be uploaded manually. After that, a document number will be available and distributed to the group.

At 9:50AM we had a 30 min break.

### **Thursday, January 15, 2004 10:30AM Session**

Lee introduced Justin McNew (TechnoCom Wireless) who presented an overview of previous analysis that were done for WAVE (doc IEEE 802.11-04/0134r1). Justin discussed traditional 802.11 scanning, authentication, and association. He addressed simulations that were performed on access time and loading of a WAVE channel. Justin addressed roadside to vehicle communication but also vehicle to vehicle communication.

Lee mentioned that a motion will come up during the plenary meeting to get acceptance to make editorial changes to the PAR.

The presentation that Broady presented during yesterday meeting was available on the server (document nr 121).

The meeting was adjourned at 11:00AM. We will reconvene at 1:30 PM.

### **Thursday, January 15, 2004 1:30PM Session**

The meeting was opened at 1:30 PM.

Broady presented work that was done with Johns Hopkins University on High speed testing of Atheros 802.11a and FreeSpace (FSK based modulation). He presented comparisons between the access time, communication time, and transaction time.

Bob Soranno (JHU/APL) was introduced who presented adjacent channel parameters to decrease the near-far interference problems.

It was mentioned that an amendment for WAVE to the IEEE standard would be presented at the next IEEE meeting.

The meeting was adjourned at 2:30PM. We will reconvene at 4:00 PM.

### **Thursday, January 15, 2004 4:00PM Session**

The meeting was reconvened at 4:05 PM.

Lee introduced Justin McNew (TechnoCom Wireless) who presented a summary of recommendations for WAVE using 802.11. Justin described the control channel concept, suppression of the beacons, authentication and association, phy parameters, timing parameters, and priority mechanisms. It was mentioned that we should take a close look at 802.11e.

Daniel Jiang (DaimlerChrysler) was introduced. Daniel presented the requirements and the reason for having a anonymity and therefore a random MAC address. A question was raised about the influence of the random number generator model on the likelihood that two randomly chosen MAC addresses are the same. It was answered that several models will be presented to the group. This random MAC address will be created every time the WAVE device is powered up.

Lee presented the motion that will be presented during the closing plenary for the approval of the editorial changes to the PAR. The motion states: “Move to replace the previously approved par document IEEE 802.11-03/0943r4 with the corrected version (editorial changes only) IEEE 802.11-03/0943r5, for forwarding to ExCom for Approval”. This motion was accepted by the group by unanimous consent.

Work is being done to write the amendments to the IEEE 802.11 standard as will be proposed by the to be established task group.

The meeting was adjourned at 4:40 PM.

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**IEEE P802.11  
Wireless LANs**

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**Minutes for the Fast Roaming SG**

**Date:** January 12-16, 2004

**Author:** Michael Montemurro  
Chantry Networks  
1200 Minnesota Ct, Mississauga, ON, CANADA  
Phone: 905-567-6900  
e-Mail: [mike@chantrynetworks.com](mailto:mike@chantrynetworks.com)

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**Monday January 12, 2004**  
10:30am

Chair: Clint Chaplin  
Secretary: Mike Montemurro

Attendance:

- Chair introductions
- Opening Remarks – Document 11-04/022r1
- Reminder of study group operating rules
  - anybody can vote and anybody may make motions
  - all motions must pass by 75%
  - separate attendance book must be kept – only need to sign in once
- Reading of bylaws on patent policy
- Reading inappropriate topics for discussion
- Agenda – Document 11-04/025r0
- Last meeting we accepted a draft PAR (Document 11-03/772r4) and Five Criteria (Document 11-03/772-03)
- Call for submissions of PAR and Five Criteria changes beyond edits to the existing drafts – None.
- Can the submissions be technical?
  - Darwin Engwer has a technical submission on defining and bounding of the problem
- This information is needed, but it should be presented after the task group has been formed
- Defining roaming is part of the scope definition of the PAR.
- This is really three presentations: system definition, roaming criteria, and test set-up.
- There are a lot of different ways of doing roaming – maybe there's a part of the presentation that could be used to constrain the scope of the PAR – could be differed to the first meeting of the task group.
- We do need to define “fast”, “secure”, as well as “roaming”
  - How do we measure these?
- We really need to define “fast” and determine how to measure it.

- The purpose of the study group is to determine whether we want to form the task group and define a scope for its work.
- Task Group N has included a throughput target in their PAR. Do we want to specify a target roaming interval in the PAR?
- The question is whether to specify metrics and their values in the PAR and 5 criteria.
- Since the PAR does not specify the target roaming interval in its text, how do we know we haven't already solved the problem?
- This study group should either define what the target roaming interval will be, or empower the task group to define what the target roaming interval will be.
- Task groups within the IEEE 802.11 working group generally take the latter approach.
- **MOTION: To approve the FRSG Agenda for this meeting.**
  - By: Clint Chaplin
  - Second: Michael Montemurro

Discussion: None

Result: Pass. Unanimous
- Let's do a straw poll to determine how the discussion should proceed.
- **Straw Poll: Where should the discussion on defining "fast" in "fast roaming" happen?**
  - a. Study and Task Group
  - b. Task Group only
  - c. Don't care

Discussion: None

Result: a – 17; b – 9; c – 0.
- We need to define "fast roaming" enough to empower the task group to solve the problem.
- Review of the scope definition in the PAR.
- When does the time when data connectivity between the DS and STA end and begin in a roaming scenario. Is the STA ever disconnected?
- Explanatory notes should be added to the PAR to define what the meaning of "fast roaming".
- Is there anyone with a definition for "fast roaming" that they want to add to the PAR document?
- At what point in time does roaming start and at what point in time does roaming end?
- At the last meeting, the scope definition used the term "minimize" to leave the definition open to different types solutions to the problem.
- If this task group "minimizes" the roaming time, what would an acceptable number be?
- Eliminating the disconnect time would be the ultimate solution.
- Defining the roaming time is the first function of the task group. It's not the responsibility of the study group.
- Without metrics, how do we know when we're done?
- We know we're done when we have an approved standard.
- That's not a technical solution, it's a political one.
- The mandate of this study group is to create the PAR and five criteria for a proposed Fast Roaming Task Group.
- If you use the word "minimize" in the scope definition, there's no way to say you are done.
- If we agree that to specify a roaming metric, we have to define how we measure it. We have to agree to a conditions and method used to measure roaming.
- We could establish a target roaming time as a goal for the task group.
- We should set a maximum roaming time, say for example, 50ms.
- But if we set a threshold, we need to define the conditions that we measure it.



- Task Group N set a raw throughput of 100 MB/s – now they are struggling to define the conditions for measuring throughput.
- We could change the word “minimize” in the PAR definition to “eliminate”. Under some circumstances we can eliminate roaming time.
- The goal is to provide secure-enough roaming that it can be exploited by WVoIP.
- The solution for this problem could be pushed back into Task Group i.
- Creating a solution for Fast Roaming does not simply involve changing the security standard – there are other factors to consider such as QoS.
- There is a requirement that the Fast Roaming solution does not break security.
- The scope definition in a PAR should provide measurable conditions that would be used to determine when the Task Group is complete.
- We’ve discussed specifying a arbitrary time of 50ms – does this make sense?
- The number 50ms is bandied about is because it’s the result of a study on what a human can hear.
- A roaming time of 50ms is a WVoIP performance criteria – it could be different for another application such as video – we should define these criteria within the task group.
- There are ways of disrupting voice communications for delays longer than 50ms.
- How about we specify that roaming times would be 50ms with security or 20ms without security?

**MOTION: Modify the PAR scope definition to add the term “within the ESS”.**

By: Clint Chaplin

Second: Jesse Walker

Discussion: None

**Result: Pass. Unanimous.**

- We should have a straw poll to determine whether we will add performance numbers to the PAR definition.
- Chair asks for a motion regarding adding performance numbers to the PAR scope definition.

**MOTION: Leave the current language regarding timing language in the PAR as is. Timing criteria and timing conditions will be defined by the Task Group.**

By: Fred Stivers

Second: Nancy Cam Winget

Discussion:

- The second sentence of this motion should be in the PAR definition.

**Result: Fails. Yes – 16; No – 7; Abstain – 3;**

**MOTION TO AMEND: Delete the first sentence and add the sentence to the PAR**

By: Jesse Walker

- POINT OF ORDER, you can delete text from a motion in this manner.
- The amendment is really a second motion
- Withdraw motion to amend and make another motion later.

**MOTION: Add “Timing criteria and timing conditions will be defined by the Task Group” sentence to the scope (Section 12) of the PAR**

By: Jesse Walker

Second: Fred Stivers

Discussion:

- Is it appropriate to have measurements in the definition as well?
- Should we add the test set-up to the PAR? Wi-Fi adds test conditions to their definitions.

- 802.3 has information on test setup and test configuration in their definitions.
  - Is this a question for the Task Group rather than the Study Group?
  - The current text provides a basis for comparing solutions for Fast Roaming
  - We are reducing the number from something that we don't know now. We should have a number, even if the text says "not greater than x"
  - If we are going to be reducing a roaming time, we have to know what that roaming time is.
  - If we are going to specify a roaming time, we need to specify the conditions
- Result: Passes. Yes – 22; No – 1; Abstain – 4;

STRAW POLL: Should the PAR contain an explicit upper roam time limit?

Discussion:

- The current definition provides enough definition.
- It's not technically feasible to specify an upper limit that is not probabilistic.
- Maybe we can specify the metric as a relative term – in form of a percentage, for example.

Result: Yes – 3; No – 16; Don't Care – 5.

- Are we willing to accept the language about timing that's in the PAR now? Are there any other motions on modifying the PAR definitions
- Are there any other proposals for changes to the PAR or Five Criteria now?
- Motion to recess until after lunch. No objections. Adjourn until 1:30pm.

Monday January 12, 2004

1:30pm

- Call for motions on changes to wording of PAR and Five Criteria.

MOTION: To change the second sentence of the first paragraph of Section 13 of the PAR to: “With increasing amounts of state being needed before connectivity is allowed as amendments are made to the 802.11 standard, the time taken to complete a roam is increasing while next generation applications demand decreased roam time.”

By: Nancy Cam Winget

Second: Jesse Walker

Discussion:

- None.

Result: PASS. Yes – 16; No – 0; Abstain – 6.

- Nancy has a small edit to Five Criteria in Section 3 – Paragraph 2.

MOTION: Change devices to device in section 3 paragraph 2 of five criteria document.

By: Nancy Cam Winget

Second: Michael Montemurro

Discussion:

- None.

Result: PASS. Anonymous

- Section 6.4 of Five Criteria. We need to wordsmith this section.

MOTION: Motion, to replace section 6.4b of the five criteria with “The main components of the technology to be developed have precedents proving their feasibility.”

By: Jesse Walker

Second: Michael Montemurro

Discussion:

- None

Result: PASS. Anonymous.

- Are the PAR and Five Criteria documents complete. Does anyone have any objection to posting what we currently have and vote on it tomorrow morning? Objections? None.
- Reconvene tomorrow morning to vote on PAR and Five Criteria. Any
- Motion to recess until tomorrow morning. No objections. Recess until tomorrow morning.

Tuesday January 13, 2004

8:00am

- Need to approve minutes from the last meeting. The document number is 11-03/905r1.

**MOTION: To approve the November 2003 Session meeting minutes. The document number is 11-03/905r1.**

By: Michael Montemurro

Second: Nancy Cam-Winget

Discussion:

- None

**Result: PASS. Anonymous.**

- New PAR ( Document number 11-03/771r5) and Five Criteria ( Document number 11-03/772r4) draft posted yesterday on the server.
- Request for any changes to either document. None.
- Any discussion?
- Does this PAR exclude IBSS and direct link? Yes.
- The PAR can be expanded in the future to cover these if necessary.
- Alternatively, a new PAR could be created to cover the solution to this problem.

**MOTION: Request that this PAR and 5 Criteria contained in 11-03/771R5 and 11-03/772R4 be posted to the ExCom agenda for WG 802 preview and ExCom approval (and subsequent submission to NesCom).**

By: Keith Amann

Second: Haixiang He

Discussion:

- None

**Result: PASS. Yes – 17; No – 2; Abstain - 6.**

- We can use some of our available time to start working on requirements.
- We will be bringing this to the working group on Friday
- Are there any submissions that could be presented?
- Some of the tasks that we could be working on would include:
  - Selection criteria
  - Definition of terms such as: fast roam, begin roam, end roam.
  - Timing criteria and conditions
- We could look at what Task Group N has been doing to define requirements
- We could look as what 802.21 has for definitions.
- The scope for 802.21 is to address roaming in heterogeneous networks. They don't mention security.
- We may want to have a joint session with 802.21 at the next meeting.
- Would it help to brainstorm on terms or recess to do some thinking on the topic?
- Two presentations could be available. One now and one later in the afternoon.
- Presentation of document 11-04/084r0 entitled "The need for fast roaming."
- Timing information in the document is simply a 4-way handshake and a 2-way group handshake – EAP authentication will make the roaming times worse.
- Different implementations show a large variance in authentication performance times
- The variance in roaming times is not a fault of the protocol definition, it's in the implementation.

- The start of the handover event in this document has been established after the association. Setting the association as the roaming start does not include time for Probe and Authentication management frames.
- One of the jobs of this group is to establish what needs to be done in order to roam.
- Everybody contributor to this meeting deals with a different architecture. There are a number of different tools that can be used to solve this problem. We need to establish a common solution to this problem.
- We don't have any empirical data on four-way handshake data. We could collect other empirical data for four-way handshake timing.
- Adjourn until 4:00pm for next presentation.

Tuesday January 13, 2004

4:00pm

- Presentation of document 11-04/086r0 entitled “Measurement 802.11 roaming intervals”
- Issue with 802.11f is that neither AP is authorized to make a transition of MU state on a re-association
- The 802.11f recommended practice does provision for security context for this transition.
- A timing trace of a particular implementation containing an Aeropeek trace will be included for Rev 1 of the document.
- The current standard allows for the STA to receive a frame from another AP even though it is associated with its current AP.
- You can’t ignore security for this measurement.
- However 802.11i is not an approved standard yet.
- Roaming begins at the last successful packet reception by the current AP. Roaming begins when the sniffer received the 802.11ACK packet.
- The proposed definition for roaming: The time interval measured from when data service ends on the current AP and data service begins on the new AP.
- The ideal solution would be to set the roaming interval to 0.
- You could use uplink traffic or downlink traffic to measure roaming intervals. Downlink traffic is the worst case for a switched DS.
- The MU scan must start well before it roams. You can’t start the roaming interval when it scans because the MU may scan well before the roaming scenario.
- The rate at which you turn the attenuator down has a big effect on the roaming interval.
- The measurement or the test set-up is not constrained to different vendor’s equipment.
- If someone has a proprietary solution for fast roaming, they are welcome to present it as a possible solution for Fast Roaming.
- Transmit power control works more efficiently than an antenna attenuator.
- Roaming is used at a term in EDSI, IETF, and cellular standards. However, we seem to be talking about handoff. Perhaps we should call it handoff. The term roaming conflicts with other standards.
- Is roaming defined at all in 802.11? Roaming is not defined in IEEE 802.11 (1999) – only mobility is mentioned.
- In other standards, roaming is defined as moving from one service provider to another.
- Should our first priority be to define terms?
- The term roaming should be defined to something that is consistent with other standards.
- 802.11k had defined roaming, but they have taken it out of the draft.
- 802.21 has defined “hand-off” as moving between heterogeneous networks.
- We can’t change the name of the group. However, we can define the terms that we use.
- From the point of view of the user community, fast roaming or Layer 2 roaming makes sense.
- Roaming has different meanings in different systems. Roaming has a well defined meaning in the cellular industry. It doesn’t need to be defined the same way for a different system.
- How about using the terms: transfer, switch-over, hand-over, or fast mobility as an alternative to roaming?
- Motion to adjourn for the January session. Approved Unanimously.

## Attendance for the Fast Roaming Study Group

Darwin Engwer	Brian Johnson	Haixaing He	Per Christoffersson
Cheng Hong	Thomas Haslestad	Frans Hermodsson	Stefan Rommer
Terry Todd	Vytas Kezys	Paul Newton	Tabashi Srkakura
Gunter Kleindl	Chaegwon Lim	Mahalingam Mani	Charles R Wright
John R Walter	Pieter-Paul Giesberts	Bob O'Hara	Henry Ptasinski
Sam Guirguis	Michael Williams	Ruben Formoso	Yaron Peleg
Fred Haisch	Bill McIntosh	Sanjiv Nanda	Fred Stivers
Jon Edney	Dan Harkins	Jesse Walker	Nancy Cam-Winget
Stephen R Whitesell	James Kempt	Dorothy Stanley	Dong-Jye Shyy
Jim Tomcik	Brian Mathews	Tom Maufer	Justin McNew
Yi-Jen Lung	Carl Kain	Mark Bilstad	David Halasz
Mike Framalovkas	Richard van Leewen	Harry Bims	David Hunter
Mathilde Benveniste	Byung-Cheal Shin	Ian Sherlock	Donald Eastlake
Victor Lin	Leo Monteban	Keith Amann	Carl Kain
Jae Hwa Lee	Kyunghee Oh	Zeel Lissack	Jim Hauser
Dennis Baker	Glen Zorn	Merwyn Andrade	Kevin Hayes
William Arbaugh	Bill Beasier	Vivek Gupta	Emily Qi
Roger Durand	Stephen Rayment	Osama Aboul-Mayd	Dave Hetherington
Anuj Puri	Alan Carlton	Andrew Myers	Takashi Aramaki
Peyush Agarwal	Fujio Watanabe	Dean Edwards	Yaron Dycian
Panfaj Karnik	Robert Soronmo	Bernard Aboba	Chris Hinsz
Jon Rosdahl	Tom Tsoulogiannis	Jonn Martell	

**IEEE P802.11  
Wireless LANs  
MESH Networking Study Group First Meeting Minutes**

**Date:** January 16, 2004

**Authors:** Donald E. Eastlake 3<sup>rd</sup>  
Motorola Laboratories  
111 Locke Drive  
Marlboro, MA 01752 USA  
Phone: +1-508-786-7554  
e-Mail: [Donald.Eastlake@Motorola.com](mailto:Donald.Eastlake@Motorola.com)

&

W. Steven Conner  
Intel Corporation, M/S JF3-206  
2111 NE 25th Ave  
Hillsboro, OR 97124  
Phone: +1-503-264-8036  
e-Mail: [w.steven.conner@intel.com](mailto:w.steven.conner@intel.com)

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**Abstract**

Minutes and attendance of the first Meeting of the IEEE 802.11 MESH Network Study Group held in Vancouver, British Columbia, Canada on Monday 12 January 2004 under the Interim Chairmanship of W. Steven Conner of Intel Corporation.

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## Significant Actions

(For the detailed minutes, including these actions, see the next section of this document.)

0. Meeting called to order at 10:32am by Steve Conner, Interim Chair.

1. Agenda 11-03-0965-01-802-11-wg-tentative-agenda-january-2004.xls was amended to remove the election of permanent chair/secretary and approved as amended, all by unanimous consent.

2. Donald Eastlake 3<sup>rd</sup> was approved, by unanimous consent, as Secretary.

3. Straw Poll:

Should there be any inclusion of non-MESH devices in the PAR?

Yes 9                      No 30                      Abstain 20

4. Straw Poll:

Do we need a hop count target in the PAR?

Yes 5                      No 45                      Abstain 9

5. Straw polls:

On the insertion of the following three sentences into Paragraph 18:

5.1 “The architecture should identify desirable flows of information from layer 2 to 3.”

Dropped from consideration by unanimous consent.

5.2 “It is intended that the architecture defined by the amendment shall facilitate an ESS Mesh to interface with higher layers and to connect with other networks using higher layer protocols.”

Yes 34                      No 3                      Abstain 17

5.3 “The amendment shall enable interoperable formation and operation of an ESS Mesh, but shall be extensible to allow for alternative path selection metrics and/or protocols based on application requirements.”

Yes 17                      No 7                      Abstain 22

6. Straw Poll:

“Do you agree with the following wording for Section 12:

‘To develop an IEEE 802.11 Extended Service Set (ESS) Mesh with an IEEE 802.11 Wireless Distribution System (WDS) using the IEEE 802.11 MAC/PHY layers that supports both broadcast/multicast and unicast delivery over self-configuring multi-hop topologies.’ ”

Yes 50                      No 1                      Abstain 4

7. Straw Poll

“Should the PAR allow an extension to the four address frame to be defined?”

Yes 25                      No 8                      Abstain 19

8. Straw Poll:

“Do you agree with the following wording for Section 13:

‘The IEEE 802.11-1999 (2003 edition) standard provides a four-address frame format for exchanging data packets between APs for the purpose of creating a Wireless Distribution System (WDS), but does not define how to configure or use a WDS. The purpose of the project is to provide a protocol for auto-configuring paths between APs over self-configuring multi-hop topologies in a WDS to support both

broadcast/multicast and unicast traffic in an ESS Mesh using the four-address frame format or an extension.’ ”

Yes 30      No 3      Abstain 16

9. Meeting recessed at 12:34pm until 1:30pm by Steven Conner, Interim Chair.

10. Meeting called to order at 1:35pm by Steven Conner, Interim Chair.

11. MOVED by Colin Lanzl, seconded by Robert Moskowitz,  
 “To adopt the text shown on the screen for section 12.” (i.e., as approved by straw poll #6)  
 PASSED      Yes 30      No 0      Abstain 9

12. MOVED by Colin Lanzl, seconded by Robert Moskowitz,  
 “To adopt the text shown on the screen for section 13.” (i.e., as approved by straw poll #8)  
 PASSED      Yes 24      No 2      Abstain 9

13. MOVED by Colin Lanzl, seconded by Mioshi Sheu,  
 “To adopt the text shown on the screen for section 18.” (i.e., as modified by straw polls above)  
 PASSED      Yes 27      No 0      Abstain 16

14. MOVED by Colin Lanzl, seconded by Dennis Baker,  
 “To adopt 11-04-0054r2 as the Mesh Networking PAR.”

14.1 MOVED to amend by replacement with  
 “To adopt document 04/0054r0 with the edits that were made during the morning and afternoon session as documented in the minutes as the draft for the ESS Mesh PAR.”

All RULED OUT OF ORDER by the chair on the grounds that r2 and the minutes have not been on the server for 4 hours.

15. MOVED by Colin Lanzl, seconded by Dennis Baker,  
 “To adopt document 04/0054r0 with the following replacements for sections 12, 13, and 18 as the draft PAR for the ESS Mesh Study Group:

‘12. Scope of Proposed Project:’

‘To develop an IEEE 802.11 Extended Service Set (ESS) Mesh\* with an IEEE 802.11 Wireless Distribution System (WDS) using the IEEE 802.11 MAC/PHY layers that supports both broadcast/multicast and unicast delivery over self-configuring multi-hop topologies.’

‘13. Purpose of Proposed Project:’

‘The IEEE 802.11-1999 (2003 edition) standard provides a four-address frame format for exchanging data packets between APs for the purpose of creating a Wireless Distribution System (WDS), but does not define how to configure or use a WDS. The purpose of the project is to provide a protocol for auto-configuring paths between APs over self-

configuring multi-hop topologies in a WDS to support both broadcast/multicast and unicast traffic in an ESS Mesh using the four-address frame format or an extension.'

**'18. Additional Explanatory Notes:'**

**'Scope of the Project. An IEEE 802.11 Extended Service Set (ESS) Mesh\* is a collection of APs interconnected with wireless links that enable automatic topology learning and dynamic path configuration.'**

**'The proposed amendment shall be an extension to the IEEE 802.11 MAC. The amendment will define an architecture and protocol for providing an IEEE 802.11 ESS Mesh using the IEEE 802.11 MAC to create an IEEE 802.11 Wireless Distribution System that supports both broadcast/multicast and unicast delivery at the MAC layer using radio-aware metrics over self-configuring multi-hop topologies. An ESS Mesh is functionally equivalent to a wired ESS, with respect to the STAs relationship with the BSS and ESS.'**

**'The amendment shall enable interoperable formation and operation of an ESS Mesh, but shall be extensible to allow for alternative path selection metrics and/or protocols based on application requirements. A target configuration is up to 32 devices participating as AP forwarders in the ESS Mesh. However, larger configurations may also be contemplated by the standard. It is intended that the architecture defined by the amendment shall allow an ESS Mesh to interface with higher layers and to connect with other networks using higher layer protocols.'**

**'The amendment shall utilize IEEE 802.11i security mechanisms, or an extension thereof, for the purpose of securing an ESS Mesh in which all of the APs are controlled by a single logical administrative entity for security. The amendment shall allow the use of one or more IEEE 802.11 radios on each AP in the ESS Mesh.'**

**PASSED      Yes 36      No 0      Abstain 12**

**16. MOVED by Colin Lanzl, seconded by Dennis Baker,  
"To adopt 11-03-760r0 as the Mesh Network 5 Criteria."**

**16. MOVED by Dave Nelson, seconded by Colin Lanzl, to add  
"with the deletion of the second sentence of 6.5a from the 5 Criteria."**

**PASSED      Yes 21      No 2      Abstain 15**

**Vote on amended item 16:**

**PASSED      Yes 20      No 0      Abstain 14**

**17. MOVED by Colin Lanzl, seconded by Mike Moreton,  
"To direct the chair to update the PAR and 5 Criteria incorporating the edits accepted by the 802.11 Mesh study group and then to take them to the 802.11 Working Group and request that it forward them to the 802 Executive Committee for approval.."**

**PASSED      Yes 32      No 0      Abstain 9**

**18. Meeting adjourned at 2:59pm by Steven Conner.**

## Full Minutes

(For a listing of just the significant actions, see the previous section of this document.)  
(Minutes taken by Donald E. Eastlake 3<sup>rd</sup>, Interim Secretary.)

Date: 12 January 2004  
Location: Regency Ballroom C, Hyatt Regency, Vancouver, British Columbia, Canada  
Officer presiding: W. Steven Conner  
Attendance: See end of minutes.

### 0. Meeting called to order at 10:32am by Steve Conner, Interim Chair.

(There being no previous meeting, there were no previous minutes to consider or approve.)

Review of Policies and Procedures of IEEE:

In a Study Group, any one who has paid registration can vote, make motions, etc., regardless of their 802.11 voting status, all motions must pass by 75%. This meeting will count towards attendance. If you are aware of any patents in our area, you must bring to the attention of the WG chair. No licensing, pricing, territories, litigation or threatened litigation, can be discussed, Please object to these and bring to the attention of the chair.

**1. Agenda 11-03-0965-01-802-11-wg-tentative-agenda-january-2004.xls was amended to remove the election of permanent chair/secretary and approved as amended, all by unanimous consent.**  
(These elections are now on the agenda for the Wednesday plenary meeting.)

Comments by the chair: We have limited time. Necessary steps are to have a Study Group approved 5 Criteria and PAR and forward that to the 802.11 working group for approve and forwarding to the IEEE 802 Executive Committee. 802 ExComm must have it 30 days before their meeting and they meet only at 802 Plenaries. If we miss March, the next chance is July.

### 2. Donald Eastlake 3<sup>rd</sup> was approved as Secretary by unanimous consent .

The chair has placed on the server document 04-0047r0 which lists all previous documents presented to the WNG Study Group in this area including tutorials.

PAR and 5 Criteria draft documents 03-759r3 and 03-760 have been on server tagged as WNG SG but have been reloaded verbatim as 04-0054r0 for PAR and 04-0056r0 for 5 Criteria tagged as from the MES SG.

Sections 12, 13, and 18 are the most important to discuss in the PAR document. It is important for our scope to be narrow enough to make progress but not so as to limit to a particular solution.

These drafts were presented to TGi and TGk in Singapore. The TGi reference was specifically included in Section 18 at their request. TGi is almost complete but does not currently cover AP to AP communications. TGk has a lot on its plate right now and is just getting started so it seems premature to explicitly reference it.

No formal discussions have occurred with other 802 working groups.

There was discussion of the 32 AP target number in the draft. Rational given was that the number came from the NRL protocol where 32 was shown to be reasonable for fast convergence and from the desire to define a scope for a market acceptable standard that can be developed within a reasonable time. It was asserted that the MANET working group in the IETF, with a larger scope, is having a lot of trouble coming to a resolution.

There was discussion of what layer this effort will be at. In particular, it should be limited to the scope of the 802.11 architecture at layer 2 or 2 ½ and should not be at layer 3 although it needs to have facilities for cooperation and coordination with layer 3 efforts. Layer 2 permits tight radio integration. One person stated that they view this effort as an extension to bridging.

There was discussion of the limitation of security to a mesh that is under a single administrative entity. This came from 802.11i which suggested it to make the problem manageable. It was informally agreed to add words limiting the required single administrative control to that “for security” and change “protocol” to “architecture”.

The point was made that the one radio and the multiple radio cases/protocols are different enough that you may get into trouble trying to treat them the same.

There seemed to be some confusion on the limit of 255 devices. Does this include forwarding elements that are not stations or APs? 32 is the key number which is intended to be all APs and traffic forwarders.

On person requested that the 32/255 numbers be struck and said “This is more like facilitating higher levels than like bridging. It should mention things that need to come out of here to communicate with higher layers/spanning trees. We may need an API to communicate with higher layers.”

In response, it was suggested that the PAR say “the architecture will allow communication to higher layers.”

The question was raised that control by a single administrative entity implies a single point of failure. In response, it was stated that a single logical administrative entity does not imply a single device. Use of something like a PGP web of trust was suggested.

A point was made in favour of the 255 number: Most protocols will probably want to track all stations so this seems like a reasonable limit.

The NRL research discusses the relation of MESH to MANET but this is too specific to add into the PAR. The 32 number of APs is MUCH more important than the 255 limit on devices.

### **3. Straw Poll: Should there be any inclusion of non-MESH devices in the PAR?**

**Yes 9**

**No 30**

**Abstain 20**

The chair modified the draft PAR to say that a target configuration is up to 32 devices participating as AP mesh forwarders in the mesh, dropping the numeric target for total devices.

It was suggested that stability and throughput would be a better limits/criteria than number of stations and that the word “hierarchical” should be added. In response, it was suggested that the hoped for task group will produce much more detailed criteria for solution evaluation.

The need to provide information to higher layers was discussed. The architecture should provide for an interface to higher levels without being too specific.

It was commented that it could be that in a few years every laptop in the room will be an AP. Maybe the limit should be the number of hops rather than number of APs. Any limit means you have to track and define fairness rules, which has QoS effects. If the numbers are just guidelines why put any numbers in?

The chair commented that we are not really considering performance at this stage and the task group can go into that in detail. In response, it was asked, if the task group is going to define this, and the numbers in the PAR will not be enforced, why not just drop them? Keeping in numbers seems to straddle the middle fence... On reason to put in a target is to distinguish us from MANET, which is important to do. Actually how many APs you can support depends on how often they change, how much processing power is available, etc., not just a number.

A comment was made against the PAR wording “identify flows between layer 2 and 3”. The speaker said there should be no flow from 3 to 2 and if layer 3 needs info, they should define it. We should be careful to not restrict ourselves to work with all possible future layer 3 protocols. The chair asked for wording and “It is intended that we work with layer 3 protocols” was suggested.

The point was stated that the motivation in coming up with a 32 AP target was to assure convergence of routing in a dynamic situation. The US Department of Defence Joint Tactical effort to do this for 1,600 to 2,000 nodes is having troubles.

The chair stated: There seems to be some concern about having a specific target, that requirements may grow. One thought I had is to add wording that a major concern is to assure interoperability. To this end we are developing a layer 2 architecture but it should be extensible to allow vendor innovations, such as alternative metrics or protocols, on top of the core protocol.

A comment was made that numbers are irrelevant. The ARPA goal was 10,000 nodes to work together in a mesh. You need to think differently with mesh. The more nodes you have the more powerful your network and the better chance you data has of getting through. The number of hops is what is important. A mesh is being deployed across the city of Miami and 3 hops is the relevant limit.

In response, the chair stated that as your network grows the scale of the solution grows and the problem becomes more difficult. While the number of nodes isn't a perfect measure it reflects the scale we are going to go after. Even if the core protocol is targeted as a smallish network, if it interfaces with higher layers, you could deploy across a city with multiple clusters.

It was asserted that people will read the letter of the PAR and think of 32 as a ceiling. In response, it was stated that the functional requirements set in a TG will be much more detailed than this and will be what really matters. The wording is ok. The problem is in link stability, number of hops, etc.

It was suggested that the PAR state up to 32 APs and up to 4 hops with no appreciable degradation of performance.

Straw poll:

**4. Straw Poll: Do we need a hop count target in the PAR?**

**Yes 5                      No 45                      Abstain 9**

It was pointed out that TGn had examples in section 18 in its PAR and this didn't act as a limit on the TG work.

It was suggested that a definition of mesh should be included in the PAR and that this was a good item for the afternoon session.

One person said a PAR depends on what problem we are solving. Users wants a network that just configures itself and works. Some stations may just want to flip a bit and become APs. There are more than 32 people in this room so not very many of them could be APs.

In response it was stated that an ESS mesh where 32 APs were forwarding traffic could handle the attendees in the room.

It was suggested that straw polls be taken on individual paragraphs.

The chair said this was a good idea but decided to first poll on three pending new suggested sentences:

**5. Straw polls on the insertion of the following three sentences into Paragraph 18:**

**5.1 "The architecture should identify desirable flows of information from layer 2 to 3."**

**Dropped from consideration by unanimous consent.**

**5.2 "It is intended that the architecture defined by the amendment shall facilitate an ESS Mesh to interface with higher layers and to connect with other networks using higher layer protocols."**

**Yes 34                      No 3                      Abstain 17**

**5.3 "The amendment shall enable interoperable formation and operation of an ESS Mesh, but shall be extensible to allow for alternative path selection metrics and/or protocols based on application requirements."**

**Yes 17                      No 7                      Abstain 22**

The chair said he would like to straw poll on sections 12 and 13.

**6. Straw Poll: Do you agree with the following wording for Section 12:**

**"To develop an IEEE 802.11 Extended Service Set (ESS) Mesh with an IEEE 802.11 Wireless Distribution System (WDS) using the IEEE 802.11 MAC/PHY layers that supports both broadcast/multicast and unicast delivery over self-configuring multi-hop topologies."**

**Yes 50                      No 1                      Abstain 4**

In response to a question as to what's being autoconfigured, the chair said that the paths between APs, i.e., the mesh, was what was meant.

In response to an objection to the claim that the current 802.11 standard does define how to use a Wireless Distribution System (WDS) the chair states that it defines the 4 address format but doesn't tell you how to set up a WDS.

It was asked whether there was a conflict between the 5 Criteria claim that no changes will be needed in shipping hardware and PAR claim that formats might change. The chair suggested that we may need the flexibility to add something and so suggested we soften the 5 Criteria. The intent of the wording is to not preclude changes needed for an efficient mesh. It was suggested that it say "extension" rather than "derivative" of the four address format. It was suggested that the words "backward compatible" be added for either derivative or extension. However, there were objections to "backward compatible".

**7. Straw Poll: Should the PAR allow an extension to the four address frame to be defined?**

**Yes 25                  No 8                  Abstain 19**

It was asked whether there should be an election protocol to decide which nodes are the APs. It was objected that this was getting into design details.

**8. Straw Poll: Do you agree with the following wording for Section 13:**

**"The IEEE 802.11-1999 (2003 edition) standard provides a four-address frame format for exchanging data packets between APs for the purpose of creating a Wireless Distribution System (WDS), but does not define how to configure or use a WDS. The purpose of the project is to provide a protocol for auto-configuring paths between APs over self-configuring multi-hop topologies in a WDS to support both broadcast/multicast and unicast traffic in an ESS Mesh using the four-address frame format or an extension."**

**Yes 30                  No 3                  Abstain 16**

**9. Meeting recessed at 12:34pm until 1:30pm by Steven Conner.**

**10. Meeting called to order at 1:35pm by Steven Conner.**

Attendance list sent around.

The chair stated that we are working on refining the PAR and 5 Criteria. The latest version is 04-0054r1 with changes from this morning.

In response to a question, the chair stated that interoperability would be at the AP level.

The question of a definition of mesh, probably in section 18, recurred. One person stated that traditionally a "mesh" just means that all nodes are richly connected. But it was pointed out that this is true of an IBSS. Another person suggested that we should use standard terminology like "subnet", a "sparsely interconnected" one. Another stated that the key ingredients are topology discovery and dynamic routing.

The chair gave his opinion that an ESS mesh is an interconnected set of APs that can form a multi-hop wireless distribution system.

A point was raised that the nature of the wireless link between APs (Point-to-point? Multipoint?) should be mentioned. It was pointed out that the use of the four address frames may imply they are all done by point-to-point links. The question is propagation characteristics. It was suggested that if we get too detailed it just get us in trouble.

There seemed to be a clear preference to add an ESS mesh definition so the chair suggested:

**"An ESS Mesh network is a collection of interconnected APs that enable automatic topology learning and dynamic path configuration."**

It was suggested that "self-healing" be added. A complaint was made that the definition is too vague. A point was made that it shouldn't be too specific. We just need enough to get authorization to go to work. The Task Group can make it more specific.

The chair suggested the following alternative:

**"An IEEE 802.11 Extended Service Set (ESS) Mesh network is a collection of APs interconnected with wireless links that enable automatic topology learning and dynamic path configuration."**

An asterisk was inserted into section 12 pointing to this definition which is in section 18.

**11. MOVED by Colin Lanzl, seconded by Bob Moskowitz,**  
**“To adopt the text shown on the screen for section 12.” (i.e., as approved by straw poll #6)**  
**PASSED          Yes 30          No 0          Abstain 9**

**12. MOVED by Colin Lanzl, seconded by bob Moskowitz,**  
**“To adopt the text shown on the screen for section 13.” (i.e., as approved by straw poll #8)**  
**PASSED          Yes 24          No 2          Abstain 9**

The chair suggested we move on to section 18.

It was suggested that the security reference to a single logical administrative entity seems to imply a Radius or similar server. In response it was stated that a Radius server is just one example. A single administrative entity does not imply a single box. It is very hard for people who don't know each other to communicate securely. They need to know each other within some administrative domain.

A comment was made that this is at layer 2 ½ and security should be handled at higher or lower levels. Others disagreed and said that security must be appropriately handled, including at this level.

**13. MOVED by Colin Lanzl, seconded by Mioshi Sheu,**  
**“To adopt the text shown on the screen for section 18.” (i.e., as modified by straw polls above)**  
**PASSED          Yes 27          No 0          Abstain 16**

A question was asked as to whether international liaison was covered. The chair pointed to section 16.

**14. MOVED by Colin Lanzl, seconded by Dennis Baker,**  
**“To adopt 11-04-0054r2 as the Mesh Networking PAR.”**

**14.1 MOVED to amend by replacement with**  
**“To adopt document 04/0054r0 with the edits that were made during the morning and**  
**afternoon session as documented in the minutes as the draft for the ESS Mesh PAR.”**

**All RULED OUT OF ORDER by the chair as r2 and the minutes have not been on the server for 4 hours.**

**15. MOVED by Colin Lanzl, seconded by Dennis Baker,**  
**“To adopt document 04/0054r0 with the following replacements for sections 12, 13, and 18 as the**  
**draft PAR for the ESS Mesh Study Group:**

**‘12. Scope of Proposed Project:’**

**‘To develop an IEEE 802.11 Extended Service Set (ESS) Mesh\* with an IEEE 802.11 Wireless**  
**Distribution System (WDS) using the IEEE 802.11 MAC/PHY layers that supports both**  
**broadcast/multicast and unicast delivery over self-configuring multi-hop topologies.’**

**‘13. Purpose of Proposed Project:’**

**‘The IEEE 802.11-1999 (2003 edition) standard provides a four-address frame format for exchanging**  
**data packets between APs for the purpose of creating a Wireless Distribution System (WDS), but**  
**does not define how to configure or use a WDS. The purpose of the project is to provide a protocol**  
**for auto-configuring paths between APs over self-configuring multi-hop topologies in a WDS to**  
**support both broadcast/multicast and unicast traffic in an ESS Mesh using the four-address frame**  
**format or an extension.’**

**‘18. Additional Explanatory Notes:’**

**‘Scope of the Project. An IEEE 802.11 Extended Service Set (ESS) Mesh\* is a collection of APs**  
**interconnected with wireless links that enable automatic topology learning and dynamic path**  
**configuration.**



‘The proposed amendment shall be an extension to the IEEE 802.11 MAC. The amendment will define an architecture and protocol for providing an IEEE 802.11 ESS Mesh using the IEEE 802.11 MAC to create an IEEE 802.11 Wireless Distribution System that supports both broadcast/multicast and unicast delivery at the MAC layer using radio-aware metrics over self-configuring multi-hop topologies. An ESS Mesh is functionally equivalent to a wired ESS, with respect to the STAs relationship with the BSS and ESS.

‘The amendment shall enable interoperable formation and operation of an ESS Mesh, but shall be extensible to allow for alternative path selection metrics and/or protocols based on application requirements. A target configuration is up to 32 devices participating as AP forwarders in the ESS Mesh. However, larger configurations may also be contemplated by the standard. It is intended that the architecture defined by the amendment shall allow an ESS Mesh to interface with higher layers and to connect with other networks using higher layer protocols.

‘The amendment shall utilize IEEE 802.11i security mechanisms, or an extension thereof, for the purpose of securing an ESS Mesh in which all of the APs are controlled by a single logical administrative entity for security. The amendment shall allow the use of one or more IEEE 802.11 radios on each AP in the ESS Mesh.’

PASSED      Yes 36      No 0      Abstain 12

16. MOVED by Colin Lanzl, seconded by Dennis Baker,  
“To adopt 11-03-760r0 as the Mesh Network 5 Criteria.”

16. MOVED by Dave Nelson, seconded by Colin Lanzl, to add  
“with the deletion of the second sentence of 6.5a from the 5 Criteria.”

PASSED      Yes 21      No 2      Abstain 15

Vote on amended item 16:

PASSED      Yes 20      No 0      Abstain 14

It was pointed out that we also need to direct the chair to bring this to the 802.11 working group for the purpose of getting it approved and forwarded to the 802 Executive Committee.

17. MOVED by Colin Lanzl, seconded by Mike Moreton,  
“To direct the chair to update the PAR and 5 Criteria incorporating the edits accepted by the 802.11 Mesh study group and then to take them to the 802.11 Working Group and request it to forward them to the 802 Executive Committee for approval..”

PASSED      Yes 32      No 0      Abstain 9

18. Meeting adjourned at 2:59pm by Steven Conner.

## Attendance

Aboul-Magd, Osama  
Andrade, Merwyn  
Aramaki, Takashi  
Audeh, Malik  
Baker, Dennis  
Bjerke, Bjorn A.  
Boot, John  
Buttar, Alistair  
Conner, W. Steven  
Eastlake, Donald  
Emeott, Steve  
Faulkner, Mike  
Filauro, Valerio  
Goubert, Gerard  
Gupta, Om P.  
Hanaoka, Seishi  
Hauser, Jim  
Hillman, Garth  
Jones, Ben  
Ketchum, John  
Kezys, Vytas  
Kunihiro, Takushi  
Kuroda, Masahiro  
Lanzl, Colin  
Levy, Joseph  
Lin, Victor  
Liu, Changwen  
Martin, Art  
Matsumoto, Yoichi  
Moreton, Mike  
Moskowitz, Robert  
Murakami, Yutaka  
Nelson, Dave  
O'Hara, Bob  
Potter, Al  
Rayment, Stephen  
Sabat, Dorian  
Sakoda, Kazuyuki  
Scalise, Fabio  
Shellhammer, Steve  
Sheu, Ming  
Skafidas, Stan  
Stephens, Adrian  
Takagi, Masahiro  
Thornton, Tim  
Trovato, Frank D.  
Yamaura, Tomoya

Adachi, Tomoko  
Aoki, Hidenori  
Asai, Yusuke  
Bachmann, Heinz  
Bensami, Florent  
Blue, Scott  
Brasier, Bill  
Coney, Andy  
Dacosta, Francis  
Edwards, Dean  
Erwin, Jeff  
Feinberg, Paul  
Frei, Randy  
Gryder, Roxanne  
Halasz, Dave  
Hasty, Vann  
Hiertz, Guido R.  
Hinsz, Chris  
Jou, Tay-Shu  
Keys, Phil  
Kossin, Philip  
Kuo, Ted  
Lambert, Paul  
Lee, Taejin  
Liang, Jie  
Lissack, Zeev  
Martell, Jonn  
Mathews, Brian  
McCann, Stephen  
Morioka, Yuichi  
Mulder, Willem  
Myles, Andrew  
Oh, Jongtaek  
Ophir, Lior  
Puri, Anuj  
Rosdahl, Jon  
Sahingoglu, Zafer  
Sastry, Ambatipudi  
Seo, Jeong-Hwan  
Shelton, Tamara  
Shyy, Dong-jye  
Stanley, Dorothy  
Surinemi, Shravan  
Terry, John  
Todd, Terry  
Uchida, Yusuke  
Young, Chris

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IEEE P802.11  
Wireless LANs

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Minutes of Wireless LAN Next Generation Standing Committee Meetings

**Date:** November 10-14, 2003

**Contact:** TK Tan  
Philips Semiconductors  
1109 McKay Drive,  
Mail Stop – 48/A  
Phone: 408 474 5193  
Fax: 408 474 5343  
e-Mail: [tktan@ieee.org](mailto:tktan@ieee.org)

(Additional notes with help from Stephen McCann, Siemens)

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**Abstract**

Minutes of WNG SC meetings held during the IEEE 802 Interim meeting in Vancouver, CA from January 16-20, 2004.

**Executive Summary:**

1. Update from MMAC
2. Wireless Interworking with External Networks presentation and motion to request that 802.11 WG form Study Group approved
3. Wireless Network Management presentation and motion to request that 802.11 WG form Study Group approved
4. Radio regulatory update
5. Discussion on how to establish the capability to provide ongoing security advice and maintenance support
6. Discussion on Korean Spectrum Allocation
7. Discussion on 6th Framework IST and approved motion to establish liaison.

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Minutes of the IEEE 802.11 WNG SC, Tuesday 13 January, 8 – 10 am.

Meeting called to order by TK Tan (Philips) at 8:02 am

WNG MEETING CALLED TO ORDER

REVIEW OBJECTIVES FOR THIS SESSION

Meeting Logistics

REVIEW IEEE/802 & 802.11 POLICIES and RULES

REVIEW MINUTES OF Albuquerque meeting doc: 0877

No discussion, No objection to approve as presented, minutes approved unanimously

11-04-0024-00-0wng-wng\_sc\_report. WNG Standing Committee Report

11-03-0993-01-0wng-interworking-sg-justification.doc

11-04-0008-02-0wng-security-standing-committee.ppt

11-03-0994-00-0wng-interworking-sg-justification-slides.ppt

11-03-0950-01-0wng-need-managed-ieee-802-11-devices.ppt

11-04-0126-00-0wng-european-6th-framework-update.ppt

11-04-0154-00-0wng-korean-spectrum.ppt

Tuesday 13th January 2004

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No reports from either MMAC or ETSI.

Proposed Interworking Motion : 993r1

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Stephen McCann presented submission about proposed interworking motion.

This passed : 36, 2, 0 (Yes, No, Abstain)

Security Standing Committee Proposal (008r2)

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Clint asked do we really want a Standing Committee ?

Wednesday 14th January 2004

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Management of Wireless Devices (Harry Worstell) : 950r1

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Requirement to get information about the MAC layer  
to find out how the system is doing.

Richard Paine stated that TGk is now starting to wind

down in terms of new technical aspects.

TGk and this group will co-ordinate time slots for the next IEEE 802.11 meeting.

Motion : 43, 0, 13

Korean spectrum allocation : ( 0154r0)

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Update on Korean spectrum 2.3 Ghz allocation (Portable Internet)

WNG Summary report for March meeting : 090r0

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(Note : there will be a re-affirmation of WNG group in March)

The first meeting of WNG was at the January 2002 meeting

What is the latest situation with liaisons to ETSI BRAN & MMAC?

Agreed (Stephen McCann) to create a sort submission about 6th Framework IST regarding WLAN evolution and put it on the server : 126r1

Also see :

\* <http://europa.eu.int>

\* <http://www.digi.no/php/art.php?id=98243>

Stephen to present update in March as an industry update ??

Thursday 15th January 2004

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3GPP SA3 ex-chairman (Colin Blanchard) will attend March meeting with a presentation.

Discussion about should he come to WNG, Interworking Study Group, and TGk ...or perhaps a joint meeting of all three.

Motion within the Study Group to send a liaison to 6th Framework, proposed by Bruce Kraemer.  
Stephen to draft some text about this (no number yet)

WNG Motions in IEEE 802.11 Closing Plenary  
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Motion to recommend creation of an Interworking Study Group : 58, 0, 25  
Now goes to Executive Committee for approval

Motion to recommend creation of a Security Standing Committee : 59, 4, 32

Motion to recommend creation of a Wireless Network Management Study Group : 41, 8, 45  
(Note this is not a MIB enhancement)  
TGk only allows data to flow from the client.  
This will allow data to flow into the client.

Motion to generate a liaison to European 6th Framework : unanimous

WNG adjourned for the week at 12:15