
IEEE P802.11
Wireless LANs

Approved Minutes of the IEEE P802.11 Full Working Group**March 10 – 14, 2003****Hyatt DFW, Dallas - Fort Worth, Texas, USA****Joint 802.11 / 802.15 Opening Plenary: Monday, March 10, 2003****1.1. Introduction**

- 1.1.1. Meeting called to order by Stuart J Kerry and Bob Heile at 1:10PM.
- 1.1.2. The agenda of the 78th session of 802.11 is in doc.: IEEE 11-03-138r3, This session is including 802.15, 802.18 RREG TAG and 802.19 Coexistence TAG, and 802.20.
- 1.1.3. Secretary – Tim Godfrey
- 1.1.4. Straw Poll of new attendees at this meeting: 121
- 1.1.5. There are 527 people in the room.

1.2. Announcements**1.2.1. Review of wireless network**

- 1.2.1.1. Wireless network operational overview
- 1.2.1.2. Review of new attendance server application
 - 1.2.1.2.1. Document 802.11 –03/044r1
 - 1.2.1.2.2. www.802wirelessworld.com will be used as the attendance book portal for future meetings.
 - 1.2.1.2.3. At this meeting Pluto works also.
 - 1.2.1.2.4. Everyone must sign in again and enter contact information again. The database is being reconstructed from scratch.
 - 1.2.1.2.5. The procedure for entering information and logging meeting attendance with the new software.
 - 1.2.1.2.6. Discussion
 - 1.2.1.2.6.1. Is the password page secure? Yes.

1.2.2. Review of policies and procedures

- 1.2.2.1. Al Petrick presents document 11-00/278r5
 - 1.2.2.1.1. Voting tokens,
 - 1.2.2.1.2. The LMSC operating rules are reviewed. The 802.11 rules are in document 00-11-33r4.
 - 1.2.2.1.3. Roberts Rules of order (latest edition) are used.
 - 1.2.2.1.4. Review of registration and media recording.
 - 1.2.2.1.5. Only WG chairs and vice chairs are allowed to give statements to media.
 - 1.2.2.1.6. updated contact information should be sent to Al Petrick.
 - 1.2.2.1.7. The voting rights and rules are reviewed
 - 1.2.2.1.8. Membership and anti-trust rules are reviewed.
 - 1.2.2.1.9. Al Petrick reviews the rules on Patents, according to the standard bylaws. All members must be aware of this policy.

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

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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**

Slide #2

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1.2.2.1.10. The copyright status and rules are reviewed.

1.3. Approve or modify agenda

1.3.1. Motion to adopt agenda

- 1.3.1.1. TK Tan
- 1.3.1.2. Second Srin
- 1.3.1.3. No Discussion
- 1.3.1.4. The agenda is adopted by unanimous consent

1.4. Minutes of Ft Lauderdale meeting

- 1.4.1. Any matters arising from minutes? None
- 1.4.2. Approved with unanimous consent

1.5. Review of Interim Meetings

1.5.1. Bob Heile reviews the next meeting venue, Singapore

- 1.5.1.1. Details in document 802.15-03-172r0
- 1.5.1.2. The meeting is structured to be break-even for 200 people.
- 1.5.1.3. Registration fee will be \$970 Australian. Ending April 12th 2003. Late fee is \$1100 AU. \$591 US dollars.
- 1.5.1.4. Comparison of previous meetings – these expenses are on par with Sydney and Hawaii.
- 1.5.1.5. Web site is ready to go, for both meeting and hotel registration. Available by Wednesday,
- 1.5.1.6. Open Issue – We can't guarantee that 802. will allow us to take projectors. We need members to bring projectors if possible. See Stuart Kerry or Bob Heile. We need at least 13 projectors.

1.5.2. September 2003.

- 1.5.2.1. Ottawa is not available. Now looking at Baltimore / Wash DC locations. Week of September 15th. Will be under contract in the next 2 weeks.

1.5.3. January 2004

- 1.5.3.1. We are having meeting in Vancouver to make up for problems last year.

1.5.4. May 2004

- 1.5.4.1. We have offers for Seoul Korea, or Amsterdam, Netherlands.

1.6. Review of Financials

1.6.1. Bob Heile reviews document 802.15-03-170r0

- 1.6.1.1. Financials for Ft Lauderdale meeting.
- 1.6.1.2. Surplus of \$49K.
- 1.6.1.3. Account balance is \$81K
- 1.6.1.4. Software development is going to cost \$50K, plus on-site fees of \$8500.
- 1.6.1.5. True cash position is \$16K.
- 1.6.1.6. Discussion
 - 1.6.1.6.1. Where do the surpluses go? For Plenaries, it goes to the 802 treasury. 802 is also paying for some of network management fees.

1.7. Review of Executive Committee meeting

- 1.7.1. Security Study group in 802.1 – postponed until Friday.
- 1.7.2. 802 financials were break-even for 2002.

- 1.7.3. A letter is drafted to be sent to companies that are claiming conformance to draft standards.
- 1.7.4. Discussion on recirculation ballot rules will be continued on Wednesday.
- 1.7.5. Policy review on the creation of additions.
- 1.7.6. ExCom is reviewing procedures on interpretation requests.
- 1.7.7. Mike Marcus to be made IEEE Fellow.
- 1.7.8. Considering changes to Patent Policy to be sure members are aware and consent to it.
- 1.7.9. Discussion
 - 1.7.9.1. Regarding the letter being drafted regarding claiming compliance to draft standards, what input from the WG will be sought? It will be brought to the 802.11 WG on Wednesday. There will be a meeting on Wednesday to discuss further.
 - 1.7.9.2. Straw poll on possible attendance to be taken on Wednesday/

1.8. Reports from Task Groups

1.8.1. TGe – John Fakatselis

- 1.8.1.1. Processing comments from LB51. LB51 passed with 83%.
- 1.8.1.2. We may not be ready for a recirculation ballot at this meeting.
- 1.8.1.3. There are about 1000 technical comments to resolve.
- 1.8.1.4. An Ad Hoc meeting was held between the previous meeting. The results will be formally presented at this meeting.
- 1.8.1.5. Discussion
 - 1.8.1.5.1. The Recirculation issue being addressed in ExCom is related to TGe. Suggest to the TGe chair to attend on Wednesday.
 - 1.8.1.5.2. Straw Poll – who would go to the discussion on recirculation rules. 8:00 to 9:00AM on Wednesday: 14 people.

1.8.2. TGf – Dave Bagby

- 1.8.2.1. Will be processing a few comments from second sponsor ballot recirculation.
- 1.8.2.2. Request for liaison work with IETF.
- 1.8.2.3. Sponsor Ballot 96% approval.

1.8.3. TGg – Matthew Shoemake

- 1.8.3.1. Results of TGg Sponsor Ballot. Return rate was 77%, which met 75% return requirement: 54 yes, 10 no, 9 abstain. 64 votes, 84% affirmative.
- 1.8.3.2. Report in document ???
- 1.8.3.3. LB54 was recirculation on Draft 6.1 Passed with 98% Yes, 2% No.
- 1.8.3.4. That ballot accepted motions from January Meeting.
- 1.8.3.5. We wanted to get to recirculation on LB54. We had conditional approval to go to Sponsor Ballot, contingent on LB54 passing.
- 1.8.3.6. We rejected the comments on LB54, and issued as sponsor ballot, which closed yesterday. 96 people in pool, 84% yes.
- 1.8.3.7. The current version is 6.2 – no technical changes from 6.1
- 1.8.3.8. Schedule is unchanged since January. Final approval in June 2003
- 1.8.3.9. This weeks objective is to resolve comments from 11 No voters. At end of week, a recirculation sponsor ballot will be requested.
- 1.8.3.10. We are planning an ad-hoc interim meeting to resolve comments. Looking for a volunteer to host such a meeting.

- 1.8.4. TGh – Mika Kasslin
 - 1.8.4.1. Sponsor Ballot of TGh – Passed 92%, 48 yes, 4 no, 7 abstain. Had 77% return Ratio.
 - 1.8.4.2. Will resolve comments during meetings this week.
 - 1.8.4.3. Will discuss wither to go to recirculation
- 1.8.5. TGi – Dave Halasz
 - 1.8.5.1. Working to go to recirculation, but don't expect to complete it this week.
- 1.8.6. TGj – Sheung Li
 - 1.8.6.1. Proposed TGj draft was posted. Objectives for this week are to review and update draft. Group will vote to accept draft and forward to LB.
- 1.8.7. TGk – Richard Paine
 - 1.8.7.1. RRM continues to work between sessions. Have a document that lists the issues. Working on a vision and architecture document. Looking at how measurements can contribute to next generation of wireless LANs.
 - 1.8.7.2. Shooting for a draft by the May meeting.
- 1.8.8. TGm – Bob O'Hara
 - 1.8.8.1. TGm PAR is before the SEC on Friday. Operating as a TG this week.
 - 1.8.8.2. First and only meeting on Tuesday. Will review comments from other WGs on the PAR. Responses due Wednesday. Will discuss the work before the TG, and discuss items that need to be corrected in 802.11, a, b, b-cor1, and d. That is the scope of the maintenance work. Currently being rolled into the 2003 edition of 802.11-1999.
 - 1.8.8.3. The documents that are generated will be 802.11ma, then 11mb, etc.
- 1.8.9. SG WNG – TK Tan
 - 1.8.9.1. Two sessions his week. Regular updates from ETSI BRAN and MMAC. Will discuss WLAN in Korea. Will have a 3GPP representative for WLAN InterWorking. More presentations on WLAN/cellular InterWorking.
 - 1.8.9.2. First presentation on VoIP over WLAN.
- 1.8.10. High Throughput SG – Jon Rosdahl
 - 1.8.10.1. Results of LB55 – Failed. Pool of 329, 294 returned 89% return, 196 yes, 93 no, 5 abstain. 68% yes, 32% no. 281 comments, 227 unique.
 - 1.8.10.2. Will start resolving comments, and revise PAR and 5 criteria. Will process comments from other Working Groups by Tuesday evening. Will review PAR and 5 Criteria, and have a presentation on Thursday evening from Jim Lansford.
 - 1.8.10.3. Discussion
 - 1.8.10.3.1. Suggests that the agenda is modified to move up the motions before the 8:30 deadline. The idea is to have the motions done before 8:00PM. The 11:01 WG time is a standing order time.
- 1.8.11. 802.15.2 Coexistence – Steve Shellhammer.
 - 1.8.11.1. The 75% return rate has not yet been met. The affirmation is 95% so far. The group will look at two negative comments this week.
- 1.8.12. 802.15.3 – John Barr
 - 1.8.12.1. First round of sponsor ballot. Have resolved comments- there are 3 outstanding negatives. One voter's comments have been resolved. Waiting for response to one resolution.

- 1.8.12.2. Recirculation ballot 73: 3: 6: 83% return, 96% affirmative.
- 1.8.12.3. 171 Comments from 9 voters.
- 1.8.12.4. This week, will look at comments and resolutions. Will look at message sequence charts and security issues. The 802 SEC said to remove all public key security.
- 1.8.12.5. Draft D17 this week will be moved to authorized distribution by IEEE.
- 1.8.12.6. Information exchange with WiMedia on Thursday.
- 1.8.13. **802.15.4 – Pat Kinney**
 - 1.8.13.1. Low rate committee – sponsor ballot recirculation passed with 95% affirmative. Will go to RevCom for approval as a standard.
- 1.8.14. **Publicity Committee – Glyn Roberts**
 - 1.8.14.1. PC meeting tomorrow. Will have 4 presentations, WFA update. WiMedia Alliance update, Bluetooth update, Zigbee alliance update. Will review what to put in 802 wireless news.
 - 1.8.14.2. Wireless events in Singapore – putting together press/media kit.
- 1.8.15. **802.15.3a – Bob Heile**
 - 1.8.15.1. 31 responses for CFP. 24 submissions. 22 will present. Drawing for order of presentation is at 3:30PM today. Presentations will start at 4:00PM and continue for the week.
- 1.8.16. **802.18 – Carl Stephenson**
 - 1.8.16.1. Radio Regulatory TAG. Document 802.18-03-013r0.
 - 1.8.16.2. Filed documents with FCC, had teleconference in February. Will determine what to do this week at the opening plenary session.
 - 1.8.16.3. US Government is now supporting allocation from 5150 to 5350 and 5470 to 5725 in terms of globally harmonized allocation. FCC will issue NPRM before WARC in June.
 - 1.8.16.4. Issue with TV translators conflicting with spectrum use in unoccupied TV channels.
 - 1.8.16.5. 2483.5 to 2492.5 could become available to unlicensed devices.
 - 1.8.16.6. ARRL is promoting 802.11b with up to 100W of power.
- 1.8.17. **802.19 – Jim Lansford**
 - 1.8.17.1. Document 802.19-03-006r0
 - 1.8.17.2. Coexistence TAG is developing guides for coexistence. Working with 15.3a as the guinea pig. Will make coexistence score sheet for proposals. Will review proposal from previous meetings and provide feedback.
 - 1.8.17.3. Interested in 802 getting involved in spectrum etiquette initiatives.
- 1.8.18. **802.20 – Mark Klerer**
 - 1.8.18.1. Working on mobility standards. First meeting of WG, voting rights are granted based on attendance. Will be taking initial contributions.

1.9. Recess for 10 minutes

2. 802.11 Opening Plenary: Monday, March 10, 2003

2.1. Opening

- 2.1.1. The meeting is called to order at 2:50PM by Stuart J. Kerry.
- 2.1.2. Logistics of room division – this room will be divided into 4. It will take 30 minutes.

2.2. Agenda

- 2.2.1. The agenda is on the server.

2.2.2. The Chair reviews the agenda

2.2.2.1. Straw Poll: New Attendees for 802.11 – 50 people.

2.2.2.2. There are 305 people present in the room.

2.3. **Announcements**

2.3.1. Voting tokens will be distributed by Al Petrick in the meeting rooms this afternoon.

2.3.2. Any discrepancies, see Al Petrick Tomorrow.

2.3.3. Documentation:

2.3.3.1. We have an interim procedure for document numbers: In the To_Doc_keeper folder, there is a doc-request folder. Put in a document with your name and authors, company, and task group. Harry will assign a number in the file name. When you see the number, erase the file.

2.3.3.2. Do not open files on the server.

2.3.3.3. Be sure documents are formatted correctly.

2.3.3.4. Templates are mandatory. Company logos and IEEE logos are not allowed. Documents must be placed on server before they are presented.

2.3.3.5. Once the system is operational

2.3.4. IP Statements

2.3.4.1. The WG chair has received IP statements from Agere and from Ericsson. They have been updated to the web site and IEEE database.

2.3.4.2. Are there any other IP statements the chair should be aware of?

2.3.4.2.1. None.

2.4. **Working Group Voters Summary**

2.4.1. Al Petrick presents document 01/402r11

2.4.2. We have 330 voters, 130 nearly voters, potential of 460 voters at this meeting.

2.5. **Approval of Agenda**

2.5.1. Any new items?

2.5.1.1. For New Business – Wednesday will have straw poll of ability to use Attendance Server

2.5.2. The agenda is adopted without objection

2.6. **Approval of Minutes from Ft Lauderdale**

2.6.1. Approved without objection

2.7. **Documentation**

2.7.1. We have 181 documents so far.

2.7.2. We still have problems with getting documents submitted. Please be sure to put documents on the server. Look at the document list and be sure any that you own that are shown as missing get submitted.

2.7.3. Documents must be correct – there is no time to repair bad formatting.

2.7.4. Documents must be on the server 4 meeting hours in advance of them being voted on. Any documents for the Plenary session Friday must be on the server. This is per the operating rules.

2.8. 802.11 Standard Rollup

- 2.8.1. The reaffirmation ballot report closed on Feb 2nd. It passed 92%, 73 : 1 : 4. Return ration 84%.
- 2.8.2. Document 03/121r2.
- 2.8.3. The rollup will be on the RevCom agenda next week.
- 2.8.4. There were two comments, both were rejected.
- 2.8.5. The sponsor ballot resolution committee was formed and has acted to resolve these comments.
- 2.8.6. Look at 03/117r1 for the database of comment resolutions for this recirculation.
- 2.8.7. A motion to affirm these resolutions will be made on Wednesday.
- 2.8.8. Publication of 802.11-1999 (2003 edition) is expected within 30 days after RevCom approval.
- 2.8.9. The WG chair expresses thanks to Terry Cole for his work in managing this work.
- 2.8.10. The WG Chair appoints Terry Cole as the Working Group technical editor
 - 2.8.10.1. Approved by acclamation.

2.9. New Business

- 2.9.1. TGm – Bob O’Hara
 - 2.9.1.1. TGm is a “preliminary” task group. Will be confirmed on Friday. The first meeting will take place tomorrow.
 - 2.9.1.2. This is the only meeting this session. We will address comments from other WG’s on the PAR.
 - 2.9.1.3. Combining 802.11, 801.11a, 802.11b, 802.11b-cor1, and 802.11d.
 - 2.9.1.4. Discussion
 - 2.9.1.4.1. Meeting is 7:00 to 9:30 on Tuesday.
 - 2.9.1.4.2. Terry Cole will be the editor of the maintenance document. This will be confirmed in the task group.
 - 2.9.1.4.3. Is the output of TGm and amendment or a revision? It will contain technical changes, so it is an amendment. It will be 802.11ma – 200x. It will be editing instructions to create a new document when updated.
- 2.9.2. The WG chair reviews tutorials that are presented tonight. Tuesday night there will be a call for interest in 802 handoff mechanisms, principles of UltraWideband, and principles of Mesh Networking.

2.10. Recess at 3:20PM**3. Mid-week Plenary: Wednesday, March 12, 2003****3.1. Opening**

- 3.1.1. The meeting is called to order at 10:45AM by Stuart J. Kerry.
- 3.1.2. The agenda is 03/138r4.
- 3.1.3. There are 210 people in the room

3.2. Announcements

- 3.2.1. Any individuals that do not have a laptop can see Al Petrick to register attendance.
- 3.2.2. The purpose of Ideal Software staff is for minimal user help getting people onto the wireless network. They cannot perform major reconfiguration or software loading on members PCs.
- 3.2.3. Documentation: The requests for document formatting have not been heeded. Harry is not going to stay up and fix documents. Bad documents will be moved into a "needs to be fixed" server. There will be a report of bad documents made at each Plenary meeting. Another list will be published for missing documents. We especially need to get minutes on a timely manner.
 - 3.2.3.1. The WG chair supports Harry's decisions.
 - 3.2.3.2. Discussion
 - 3.2.3.2.1. We have a four hour rule about server? If they are not in the proper format, do they meet the rule? The chair rules that an improperly formatted document cannot be presented or used for a motion.
- 3.2.4. On Wednesday 1:00 to 2:00PM there is a meeting of 802 Standards Association. The subject will be conformance letters.
- 3.2.5. We are staging the network for Singapore in advance.
- 3.2.6. We will verify that our equipment is certified for use in Singapore.
- 3.2.7. The CAC will meet at 7:00AM Thursday.

3.3. IP Statements

- 3.3.1. The WG chair has not received any new IP statements.

3.4. Review of the Agenda

- 3.4.1. Any changes to Old Business?
 - 3.4.1.1. PAR for 11m
- 3.4.2. Any other new business?
 - 3.4.2.1. A request to consider a liaison to 802.20?
 - 3.4.2.1.1. The WG chair requests we address this Friday.
 - 3.4.2.1.2. The WG chair would like to move Liaison reports to the Wednesday session for subsequent meetings.
 - 3.4.2.1.3. All Liaisons should also bring up items for ExCom on Friday in addition.
 - 3.4.2.2. A status of HTSG by Jon Rosdahl.
 - 3.4.2.3. Request for a straw poll on an 802.11g ad-hoc session.
 - 3.4.2.3.1. Any objection to holding the straw poll right now? None
- 3.4.3. Straw Poll: Who would attend an ad-hoc meeting of 802.11g in the US between this meeting and the May meeting, to address comments on the recirculation ballot? 14 people.
- 3.4.4. Any other New Business for the agenda
 - 3.4.4.1. TGf is done for the week, and giving up its rooms. TGk will take the Thursday Evening session.
 - 3.4.4.2. Any objection for HTSG taking the Wednesday afternoon sessions? Jon Rosdahl will notify the meeting planners to be posted during the Lunch hour. No Objections.
 - 3.4.4.3. Additional room change TGe moves to ballroom 5-6, TGh in Ballroom 7.

- 3.4.4.4. A new agenda will be posted.
- 3.4.5. Any other changes to the agenda?
 - 3.4.5.1. None
- 3.4.6. Any discussion on the agenda?
 - 3.4.6.1. Objection to holding HTSG in parallel with TGg. People are involved in both.
 - 3.4.6.2. 802.11g passed a motion in January requesting that HTSG and TGg would not overlap.
 - 3.4.6.3. The reason for requesting the time for HTSG is for ad-hoc groups. The HTSG chair requests marking that session time as 'ad-hoc' to alleviate the concern.
 - 3.4.6.4. The objector is satisfied.
 - 3.4.6.5. One member feels that we cannot constrain sessions to not be concurrent.
- 3.4.7. Approval of the agenda
- 3.4.8. Motion to adopt the r4 agenda as modified.
 - 3.4.8.1. Motion ID 391
 - 3.4.8.2. Moved Bob O'Hara
 - 3.4.8.3. Vote: Passes 99 : 10 : 9

3.5. Old Business

- 3.5.1. Approve the PAR for 802.11m
 - 3.5.1.1. Document 03/178r0
 - 3.5.1.2. TGm passed a motion to adopt the revised PAR .
 - 3.5.1.3. The actual document being produced will be 802.11ma
 - 3.5.1.4. Moved on behalf of TGm: Adopt the revised PAR (in the format supplied by the IEEE) as the PAR for TGm.
 - 3.5.1.4.1. Moved Bob O'Hara on behalf of TGm
 - 3.5.1.4.2. Motion ID 392
 - 3.5.1.4.3. Discussion
 - 3.5.1.4.3.1. None
 - 3.5.1.4.4. Vote: Passes 120 : 0 : 0

3.6. New Business

- 3.6.1. 802.11 standard Roll-up
 - 3.6.1.1. Report in document 03/197r0
 - 3.6.1.2. Two parallel activities to keep 802.11 up to date.
 - 3.6.1.3. TGm makes functional and technical amendments are output.
 - 3.6.1.4. WG activity makes editorial changes.
 - 3.6.1.5. Document 03-199r0-W-Potential-WG-editor-errata.xls contains editorial issues to be addressed.
 - 3.6.1.6. Document 03-198r0-W-Status-of-802.11-editing.xls identifies potential overlaps in the editing activities.
 - 3.6.1.7. Move that the WG accept the resolutions as found in doc 03-117r1 and support approval of the recirculated document at the March REVCOM meeting. By taking this action, the WG affirms that it believes the document is useful in its current form and contains no significant obsolete or erroneous information.
 - 3.6.1.7.1. Motion ID 393
 - 3.6.1.7.2. Moved Terry Cole.
 - 3.6.1.7.3. Second Harry Worstell
 - 3.6.1.7.4. Vote: Passes 102 : 0 : 9

- 3.6.1.8. Move to submit 802.11-1999 (2003 edition including 802.11d amendment) to ISO/IEC for Fast Track approval through the UK national body. Robin Tasker has volunteered to make the submission, and Terry Cole will be the project editor.
 - 3.6.1.8.1. Moved Terry Cole
 - 3.6.1.8.2. Second Harry Worstell
 - 3.6.1.8.3. Discussion
 - 3.6.1.8.3.1. Why is it 1999 (2003 edition), and not 802.11-2003? It has to do with what an edition does. The IEEE rules leave in place the original documents that are rolled up. This contains 802.11-1999 and its included amendments. We cannot have made any technical changes. The original document still stand on the books until we issue a revision.
 - 3.6.1.8.4. Vote: Passes 110 : 0 : 2
- 3.6.2. Status of HTSG – Jon Rosdahl
 - 3.6.2.1. Have been working on LB55 comment resolutions. We have placed R4 of PAR and 5 Criteria, and Rev 2 of comment responses.
 - 3.6.2.2. The SG reminds the members that it was formed with the intent of looking at evolutionary and revolutionary ideas. The SG starting was delayed to allow other TGs to complete their work. The SG does need extra time to complete its work.
 - 3.6.2.3. In the event the PAR and 5 criteria are not finished, the SG loses its charter at the end of this week. We need to submit them to the WG and ExCom by Friday.
 - 3.6.2.4. The group needs to focus on coming to an consensus.
 - 3.6.2.5. The HTSG chair has not been informed of any official positions from any other 802 working groups. There is no requirement for a response today.
 - 3.6.2.5.1. The WG chair notes that there was one input from NesCom, but not from any other WG.
 - 3.6.2.5.2. The comments have been addressed.
 - 3.6.2.6. The WG chair announces that there are two candidates for the Task Group Chair. Bruce Kraemer and Matthew Shoemake. When the PAR and 5 Criteria are ready, there will be an election. This will come up in the New Business agenda in the Friday Plenary.
 - 3.6.2.7. Procedure – each candidate will have 5 minutes to make a statement before the election. If there is are new candidates, there will be successive ballots and the lowest vote is eliminated in each round.
 - 3.6.2.8. There have been questions about serving chairs taking on additional chairs of new TGs. The WG chair states that there is no precedent, and there is nothing to prevent it. In other WGs the WG chair is a TG chair.
 - 3.6.2.9. Prior to 8:30PM Thursday, the final PAR and 5 Criteria documents must be on the server, since the vote is a standing order item at 11:01 on Friday. The HTSG chair requests continued support towards completing the PAR and 5 Criteria.
- 3.6.3. Motion to amend the agenda to add a motion from 802.18 to approve a document in New Business.
 - 3.6.3.1. Moved Carl Stephenson
 - 3.6.3.2. Second Al Petrick
 - 3.6.3.3. Motion passes with no objection.
 - 3.6.3.4. Motion: To approve document 18-03-014r0_Letter_re_Unlicensed_Spectrum_Bills.doc, authorizing the Chair of 802.18 to do necessary editorial and formatting changes and, using the document as a “template,” create personalized versions and deliver

those letters to the appropriate Senators and Representatives regarding S-159 and HR-363.

3.6.3.5. Moved Carl Stephenson on behalf of 802.18

3.6.3.6. Approved by Unanimous Consent

3.6.4. Recess at 11:45

4. 802.11 Closing Plenary: Friday, March 14, 2003

4.1. Opening

4.1.1. The meeting is called to order by Stuart J. Kerry at 8:00AM

4.1.2. The chair reviews the current agenda, 03/138r4.

4.1.3. There are two current nominees for HT TG Chair. Mika Kasslin is another possible nomination. This will be the last opportunity for nomination.

4.1.4. The chair reviews the current agenda, there are no changes.

4.1.5. Any objection to accept the agenda as shown? Any Modifications?
None.

4.1.6. The agenda is approved with unanimous consent.

4.2. Announcements

4.2.1. Reminder to CAC membership of meetings described in the agenda.

4.2.2. Update on network and attendance.

4.2.2.1. The new attendance system is in a beta test

4.2.3. Singapore meeting information is on the web site. Registration is open for the hotel and meeting. The credit card will be asked for twice, once for meeting, and once for hotel. Be sure to book both hotel and meeting through the web site as it is a package.

4.2.4. Nominations for HT TG Chair. Mika Kasslin is nominated by Simon Black.

4.2.5. There are now three in the contest – Bruce Kraemer, Matthew Shoemake, Mika Kasslin.

4.3. IP Statements

4.3.1. The chair has not received any new IP statements.

4.4. Documentation Update

4.4.1. There were 38 pre-meeting documents. There are 87 new documents this week. Presently we have 10 documents in the “need to be fixed area”. There were 138 documents requested in 2002 that have not been submitted. In this year we have 53 out of 157 that have not been submitted.

4.5. Task Group Updates

4.5.1. TGf – Dave Bagby

4.5.1.1. Report in document 03/164r2

4.5.1.2. Second recirculation ballot (96% affirmative) brought two new NO votes, and 4 comments. Resolutions in document 166r2.

4.5.1.3. No changes were made in the draft.

- 4.5.1.4. New draft in D6.0. One more recirculation ballot is required to insure the sponsor pool agrees with the handling of comments.
- 4.5.1.5. There will be a 15 day sponsor recirculation ballot.
- 4.5.1.6. There was a request for liaison with IETF regarding radius attributes. We have asked the AAA group of IETF to review the comment, and IEEE will make it available to IETF in pre-publication status for purchase.
- 4.5.1.7. Comments will be submitted to IEEE as a request for interpretation. However the TGf task group will no longer exist.
- 4.5.1.8. Recirculation to complete before May Meeting.
- 4.5.1.9. ExCom will forward Draft 6.1 (with membership)) to RevCom for June Meeting.
- 4.5.1.10. Output documents 166r2, Minutes in 03/165
- 4.5.1.11. Thanks to all who participated in TGf.
- 4.5.2. TGg – Matthew Shoemake
 - 4.5.2.1. Report in document 263r1
 - 4.5.2.2. Resolved comments from first sponsor ballot.
 - 4.5.2.3. Accepted 124, rejected 100, and countered 42.
 - 4.5.2.4. Updated document 219r15 with comment resolutions.
 - 4.5.2.5. Draft is updated to D7.0 based on motions this week.
 - 4.5.2.5.1. Technical and editorial changes were made, and the final draft has been on the server for the required time.
 - 4.5.2.6. Schedule – document 73r4. Should be able to complete work by June.
 - 4.5.2.7. There will be a TGg Ad-Hoc in Austin, April 14th to 16th.
 - 4.5.2.8. Will move to forward D7.0 to sponsor ballot, to close by April 10th.
 - 4.5.2.9. Will authorize the Austin Ad Hoc to make changes and forward to sponsor ballot. Will move to authorize the TGg to resolve comments and forward documents at the Singapore meeting.
 - 4.5.2.10. Will request ANA to reserve a proprietary information element.
 - 4.5.2.11. Discussion
 - 4.5.2.11.1. Will ExCom allow a 15 day recirculation?
 - 4.5.2.11.1.1. The WG chair says 15 days is acceptable. The ExCom believes it is adequate.
- 4.5.3. TGh – Mika Kasslin
 - 4.5.3.1. Report in document 03/251
 - 4.5.3.2. Draft D3 in sponsor ballot
 - 4.5.3.3. Resolutions in document 137r3.
 - 4.5.3.4. The revised draft is not yet ready – it will be completed in 2-3 weeks for recirculation. It will close 1 week before the May Interim meeting.
 - 4.5.3.5. Objectives for May meeting – review comments on recirculation, prepare revised draft, conduct recirculation ballot.
- 4.5.4. TGi – Dave Halasz
 - 4.5.4.1. Report document 03/262r1.
 - 4.5.4.2. LB52 passed with 76%, with 2000 comments.
 - 4.5.4.3. Have been working on resolving comments for recirculation.
 - 4.5.4.4. There will be another Ad Hoc April 22-24 in Santa Clara.
 - 4.5.4.5. Objective is for recirculation ballot in May.
 - 4.5.4.6. Work on fast roaming – compromise proposal was developed.
- 4.5.5. TGj – Sheung Li
 - 4.5.5.1. Report in document 03/250r1.
 - 4.5.5.2. Voted 28:0:0 to approve TGj draft 1.0

- 4.5.5.3. Motion was passed to issue a letter ballot
- 4.5.5.4. A motion was passed to empower TGj at the interim meeting.
- 4.5.5.5. Will re-address channel numbering in May, and the channel widths. The MMAC liaison wishes to see a 10Mhz channel width.
- 4.5.5.6. Minutes in document 230.
- 4.5.5.7. TGh features were not adopted, since they are not a Japanese requirement.
- 4.5.5.8. Will review comments in the May meeting, and issue a new letter ballot.
- 4.5.6. TGk – Richard Paine
 - 4.5.6.1. Report in 03/260r0.
 - 4.5.6.2. Had 15 technical presentations and developed draft 0.1.
 - 4.5.6.3. Will hold weekly teleconferences. This was approved for the whole year. There will be 8 teleconferences.
 - 4.5.6.4. The goal is to issue letter ballot at the end of the May meeting.
- 4.5.7. TGM – Bob O'Hara
 - 4.5.7.1. Report and minutes in document 03/178r1
 - 4.5.7.2. Soliciting input from Task Groups on maintaining base standard. Developing PAR
 - 4.5.7.3. No comments received from other working groups.
 - 4.5.7.4. PAR was developed on Wednesday, and will be presented to SEC this afternoon.
 - 4.5.7.5. Work Items have been received – there are 3 documents submitted earlier, detailing items in 802.11 that are in need of maintenance. Other items are known from the work on the 2003 edition.
 - 4.5.7.6. 802.11f requested that the management primitives for association and Reassociation re-addressed, since there are inconsistencies.
 - 4.5.7.7. There will be updates to regulatory information
 - 4.5.7.8. There will be updates on the IBSS and PCF descriptions.
 - 4.5.7.9. Matching of “shalls” and PICS items, dealing with message sequences and SDL issues.
 - 4.5.7.10. Resolution of ambiguities, we have to deal with issues of legacy devices becoming non-compliant.
 - 4.5.7.11. Interpretation requests are handled by IEEE standards board.
- 4.5.8. TGe – Duncan Kitchin
 - 4.5.8.1. Report in document 03/256r0
 - 4.5.8.2. The group resolved comments this week.
 - 4.5.8.3. There will be an ad-hoc meeting in Briarcliff New York April 28-May 1.
 - 4.5.8.4. There will be teleconferences every Wednesday Starting March 26th. Will try to resolve all comments by the end of the May meeting
 - 4.5.8.5. Will move to empower the May Interim to issue a recirculation ballot.
- 4.5.9. WNG – TK Tan
 - 4.5.9.1. Report in 03/035r0
 - 4.5.9.2. Presentations on Voice over IP, Mimo channel models, and Korean spectrum allocation.
 - 4.5.9.3. Discussed wireless InterWorking
 - 4.5.9.4. Regular updates from liaisons.
 - 4.5.9.5. 3GPP reports were presented.
 - 4.5.9.6. Discussion
 - 4.5.9.6.1. There will be a session on Friday Afternoon in Singapore. The Singapore Infocommunication department is

prepared to provide a keynote to the opening plenary. They will organize and sponsor activities. They will organize a mini-workshop on Friday afternoon.

4.5.9.6.2. There will be a media briefing.

4.5.9.6.3. The agenda for Friday and Saturday will be posted on the web site.

4.5.10. Publicity – Al Petrick

4.5.10.1. Report in 03/261r0.

4.5.10.2. Received reports from WFA, WiMedia, Bluetooth, Zigbee

4.5.10.3. Updated media press kit.

4.5.10.4. Had 89 members in meeting.

4.5.10.5. Will host teleconferences with WG chairs for technical presentation for Singapore.

4.5.11. HTSG – Jon Rosdahl

4.5.11.1. Report in document 03//179r0

4.5.11.2. Resolved comments on LB55

4.5.11.3. LB55 failed with 68% yes. The SG processed comments and prepared revised PAR and 5 Criteria. Motion to forward to ExCom passed unanimously.

4.5.11.4. 281 comment were submitted, all unique comments were resolved.

4.5.11.5. The PAR and 5 Criteria were sent to the SEC, with indication that it was tentative. The PAR was not presented to the other working groups.

4.5.11.6. The SEC will take up the PAR and 5 Criteria in the July plenary. The SEC will reconsider the PAR on July 25th.

4.5.11.7. NesCom will be September 9-11. The HTSG will ask for a continuance of the SG charter through July.

4.5.11.8. The May meeting will start developing technical criteria.

4.5.11.9. 02/798r7 is the PAR that was on the server last night in time.

4.5.11.10. Response document 799r6.

4.5.11.11. Comment resolution in 03/180r7. Minutes in 187r0.

4.5.11.12. 165 people attended. Have had 262 unique individuals participating.

4.5.11.13. Discussion

4.5.11.13.1. What is the earliest time the Task Group can start? September. The WG chair notes that the SG can operate as a Task Group until then. There is no delay in the work.

4.5.12. Maintenance activity: Technical Editor Report – Terry Cole

4.5.12.1. Report in 03/197r1

4.5.12.2. Review of objectives – documents 198 and 199 contain work to be done. Will monitor documents, and coordinate balloting and publishing.

4.5.12.3. There are no documents currently approved for publication. Will track re-affirmation. IEEE staff is aware that 802.11f, 802.11g, and 802.11h are near publication.

4.5.12.4. IEEE staff is concerned about documents being submitted in Word format. Editors will work towards moving to documents to Framemaker format in some time in the approval process.

4.5.12.5. Additions have a lower priority. We will not ask for additions, but ask them to stand as amendments.

4.5.12.6. Working on ISO draft to get it approved and updated.

4.6. *Special Orders Motions*

4.6.1. TGe

- 4.6.1.1. To empower the WG during the May 03 interim meeting to make any decisions regarding the LB51 comment resolution process, including the approval of a new TGe draft and initiating recirculation ballot
 - 4.6.1.1.1. Moved Duncan Kitchin on behalf of TGe
 - 4.6.1.1.2. Vote: Passes 130 : 0 : 3
- 4.6.2. TGf
 - 4.6.2.1. Move to empower TGf to hold an interim meeting in May 2003 to conduct business required to making progress with respect to sponsor ballot or re-circulation process, conduct teleconferences, create new draft and handle other business necessary to progress through the IEEE standards process.
 - 4.6.2.1.1. Moved Dave Bagby
 - 4.6.2.1.2. Motion passes with unanimous consent.
- 4.6.3. TGg
 - 4.6.3.1. Move to authorize an IEEE 802.11g Ad-Hoc meeting April 14-16, 2003.
 - 4.6.3.1.1. Moved Matthew Shoemake
 - 4.6.3.1.2. Second Colin Lanzi
 - 4.6.3.1.3. Motion passes with unanimous consent
 - 4.6.3.2. Move to forward Draft 7.0 of 802.11g to a 15-day Sponsor Recirculation ballot such that the Sponsor Recirculation closes by April 10, 2003.
 - 4.6.3.2.1. Moved Matthew Shoemake on behalf of TGg
 - 4.6.3.2.2. Vote: passes 140 : 0 : 1
 - 4.6.3.3. Based on the results of the Sponsor Recirculation ballot on Draft 7.0 of 802.11g, move to enable TGg to resolve comments, update the draft and/or forward the resulting draft to Sponsor Recirculation ballot at its April 2003 ad-hoc meeting.
 - 4.6.3.3.1. Moved Matthew Shoemake on behalf of TGg
 - 4.6.3.3.2. Vote: passes 125 : 0 : 7
 - 4.6.3.4. Move to enable TGg to resolve Sponsor Ballot comments, update the draft and/or forward the resulting draft as needed at the May 2003 session.
 - 4.6.3.4.1. Moved Matthew Shoemake
 - 4.6.3.4.2. Second Carl Stephenson
 - 4.6.3.4.3. Vote: passes 134 : 0 : 2
 - 4.6.3.5. Move to direct the 802.11 Working Group chair and the 802.11g Task Group chair to place 802.11g on the RevCom agenda for consideration at the June 2003 session prior to the deadline of May 2, 2003.
 - 4.6.3.5.1. Moved Matthew Shoemake
 - 4.6.3.5.2. Second Bob Kuahara
 - 4.6.3.5.3. Discussion
 - 4.6.3.5.3.1. Does this require SEC approval? There are other conditions – we have to have voting results. The WG chair notes that a sponsor ballot is the property of IEEE, it is above 802.
 - 4.6.3.5.3.2. The date is corrected to May the 2nd without objection
 - 4.6.3.5.4. The motion is approved with unanimous consent.
 - 4.6.3.6. Move to request that the ANA reserve information element ID 47 as Broadcom Proprietary.
 - 4.6.3.6.1. Moved Matthew Shoemake on behalf of TGg
 - 4.6.3.6.2. Discussion

- 4.6.3.6.2.1. Is this done because it is in wide distribution, or just because they want an ID?
- 4.6.3.6.2.2. It has been in use prior to this year.
- 4.6.3.6.2.3. We don't have any information on its use, but it is currently unassigned by the ANA.
- 4.6.3.6.3. The vote is conducted, but not announced.
- 4.6.3.6.4. Discussion
 - 4.6.3.6.4.1. The WG chair rules this is a technical motion.
 - 4.6.3.6.4.2. Is there a precedent for assigning proprietary elements? Yes – at the last meeting we assigned a number of them that were already in use.
 - 4.6.3.6.4.3. Should the vote be re-counted since the procedural / technical question was not clear at the time of the vote? The WG chair states that the vote will be taken again.
 - 4.6.3.6.4.4. What is the procedure for proprietary elements? Are we setting a precedent to start using elements, and then come in and ask for it?
 - 4.6.3.6.4.5. The January motion made a specific recommendation. There is now a vendor specific element. That should be used in the future. Anything that is out there before that point we will allocate. From this point on, the vendor specific element should be used.
 - 4.6.3.6.4.6. Was this Broadcom element in use before the vendor-specific element was defined. Yes.
- 4.6.3.6.5. Appeal the chairs ruling that a re-count is needed. Being technical/procedural should not change anyone's vote.
 - 4.6.3.6.5.1. Moved Dave Bagby.
 - 4.6.3.6.5.2. Second Jon Rosdahl
 - 4.6.3.6.5.3. Recess for one minute.
 - 4.6.3.6.5.4. The WG chair withdraws the statement that the motion is technical. It is procedural.
- 4.6.3.6.6. Point of order:
 - 4.6.3.6.6.1. There was an appeal and a second. The procedure is that there is a vote on the appeal.
- 4.6.3.6.7. Discussion
 - 4.6.3.6.7.1. The issue is on whether to re-count. The issue of procedural/technical is not at hand.
 - 4.6.3.6.7.2. We are looking for the bodies opinion on whether the vote should be re-counted.
 - 4.6.3.6.7.3. Defining the meaning of a field in the standard is technical. Suspect that there are no-voters that would re-consider and save time.
 - 4.6.3.6.7.4. We should not hold the vote again.
 - 4.6.3.6.7.5. Vote on the appeal on whether to re-count the vote. 54 : 54 : 29
 - 4.6.3.6.7.6. The chair breaks the tie; decides there will not be a re-count.
- 4.6.3.6.8. The results of the vote previously taken are announced: motion passes 53 : 17 : 58

4.6.4. TGh motions

- 4.6.4.1. Move to empower TGh to hold an interim meeting in May 2003 to conduct business required to making progress with respect to sponsor ballot processing, create new draft and handle other business necessary to progress through the IEEE standard process
 - 4.6.4.1.1. Moved Mika Kasslin on behalf of TGh

4.6.4.1.2. Approved with unanimous consent

4.6.5. TGi

4.6.5.1. Move to empower TGI to hold an interim meeting in May 2003 to conduct business required to making progress with respect to letter ballot or re-circulation process, conduct teleconferences, create new draft and handle other business necessary to progress through the IEEE standards process.

4.6.5.1.1. Moved Dave Halasz on behalf of TGi

4.6.5.1.2. Discussion

4.6.5.1.2.1. The teleconference motions are usually separate – when are the teleconferences.
Teleconferences will be announced with the 30 day notice.

4.6.5.1.3. Approved with unanimous consent.

4.6.5.2. Request the 802.11 Chair to submit the following comment to NIST comments list kmscomments@nist.gov by April 3:

“IEEE 802.11 would like NIST to allow HMAC-SHA1 and AES-CBC-MAC to be used in approved KDFs (Key Derivation Functions) as alternatives to a one-way hash function in Clause 5.3 of the draft SP 800-56.

A strong theoretical basis exists for using HMAC-SHA1 and AES-CBC-MAC as pseudo-random functions. Also, HMAC-SHA1 and block ciphers in CBC-MAC mode are used widely as pseudo-random functions. Since the heart of any key derivation function is typically a pseudo-random function, it seems appropriate to consider these for use in NIST-approved key derivation functions. The IEEE 802.11 Task Group i has already adopted HMAC-SHA1 and is considering using AES-CBC-MAC.”

4.6.5.2.1. Moved Dave Halasz on behalf of TGi

4.6.5.2.2. Vote: Passes 101 : 0 : 8

4.6.5.3. Request IEEE 802.11 Working Group Chair to forward the following letter to the IETF Chair:

From: Stuart Kerry, Chairman IEEE 802.11
To: Harald Alvestrand, Chairman IETF, IESG
Title: Input to IETF EAP Working Group on Methods and Key Strength
Purpose: For Information

Dear Harald,

We thank the IETF and the EAP WG for its ongoing work supporting the specification of EAP methods, EAP keying, and RADIUS keying attributes.

The purpose of this letter is to provide the EAP WG with additional input on (a) the EAP methods and credentials that are important to IEEE 802.11 wireless LAN deployments, and (b) IEEE 802.11i EAP Key Strength requirements.

EAP Methods and Credentials

Deployments of IEEE 802.11 WLANs today use several EAP methods, including EAP-TLS, EAP-TTLS, PEAP and EAP-SIM. These methods support authentication credentials that include digital certificates, usernames and passwords, secure tokens, and SIM secrets.

The IEEE 802.11i draft specification requires that one or more published, reviewed EAP methods are available which

- Support the following credentials: digital certificates, user-names and passwords, existing secure tokens, and mobile network credentials (GSM and UMTS secrets).
- Generate keying material
- Support mutual authentication
- Are resistant to dictionary attacks, and
- Provide protection against man-in-the-middle attacks.

It is desirable that the EAP methods have the following attributes

- Support fast resume
- Support end-user identity hiding
- Support for public/private key (without necessarily requiring certificates)
- Provide asymmetric credential support (password on one side, public/private key on the other), and
- Protect legacy credentials, such as passwords, from direct attack.

The current mandatory-to-implement EAP method is EAP-MD5. EAP-MD5 does not meet IEEE 802.11's requirements. We request that the mandatory to implement EAP methods be augmented to include one of the methods that IEEE 802.11 is able to use.

Key Strength Requirements

IEEE 802.11i RSN networks will use IEEE 802.1X and EAP methods to implement end user authentication, and require that these EAP methods provide keying material. The IEEE 802.11i requirement is that

The EAP method must be capable of generating keying material with 128-bits of effective key strength. Key material must be at least 256 bits in length.

Please contact Stuart Kerry, IEEE 802.11 Working Group Chair and David Halasz, IEEE 802.11i Task Group Chair dhala@cisco.com with any questions, and to discuss IETF follow-up.

Stuart Kerry

4.6.5.3.1. Moved Dave Halasz on behalf of TGi

4.6.5.3.2. Vote: Motion passes 108 : 0 : 7

4.6.6. TGj

4.6.6.1. To request an IEEE 802.11 working group letter ballot on draft 1.0 of the j amendment to the 802.11 standard to be issued within 14 days following the close of the March 2003 session.

4.6.6.1.1. Moved Sheung Li on behalf of TGj

4.6.6.1.2. Vote: 104 : 0 : 4

4.6.6.2. To empower Task Group J to hold teleconferences, interim, and ad hoc meetings to discuss and resolve letter ballot comments and, if necessary and confirmed by the working group at the May 2003 meeting, issue subsequent letter or recirculation ballots.

4.6.6.2.1. Moved Sheung Li on behalf of TGj

4.6.6.2.2. Motion approved by unanimous consent

4.6.7. TGk

4.6.7.1. Move to empower TGk to hold an interim meeting in May 2003 to conduct business required to making progress with respect to creating a new draft and handle other business necessary to progress through the IEEE standards process.

- 4.6.7.1.1. Moved Richard Paine
- 4.6.7.1.2. Second Carl Stephenson
- 4.6.7.1.3. Motion approved by unanimous consent

4.6.8. HTSG

- 4.6.8.1. The WG chair asks if there is any objection to waiving the 4 hour rule on this particular motion, since it has been on the server for under 4 hours?
 - 4.6.8.1.1. None.
- 4.6.8.2. Moved: Submit documents 02-798r7 and 02-799r6 which are the PAR and 5 Criteria response for creation of a NEW Task Group to the SEC and to NesCom.
 - 4.6.8.2.1. Moved Jon Rosdahl on behalf of HTSG
 - 4.6.8.2.2. Vote: Motion passes 94 : 2 : 5
- 4.6.8.3. Move: To continue the charter of the HT-SG through the July 2003 Plenary as a contingency to respond to any outstanding comments from the WG or SEC or NESCOM as the PAR and 5 Criteria are processed should the PAR not be approved.
 - 4.6.8.3.1. Moved Jon Rosdahl on behalf of HTSG
 - 4.6.8.3.2. Vote: Motion passes 100 : 1 : 3
- 4.6.8.4. The WG chair thanks Jon Rosdahl for his work leading the HTSG. The WG chair asks for Jon Rosdahl to continue involvement during the transition period into a Task Group.

4.6.9. WG Motions

- 4.6.9.1. Move to include the Technical WG editor as a member of the CAC, and to incorporate the proposed text change into the next revision of Section 2.4.2 of the 802.11 WG rules 331/r4
 - 4.6.9.1.1. Moved Al Petrick
 - 4.6.9.1.2. Second Carl Stephenson
 - 4.6.9.1.3. Discussion
 - 4.6.9.1.3.1. What text will be incorporated? Just the words "Working Group Technical Editor"
 - 4.6.9.1.3.2. When is the next revision? This is referencing r5? Yes.
 - 4.6.9.1.4. Motion Is approved with unanimous consent.

4.6.10. 802.18 motions

- 4.6.10.1. To approve document 18-03-021r0_802_Opp_Pet_RM-10666.doc, authorizing the Chair of 802.18 to do necessary editorial and formatting changes, seek SEC approval as an 802 document, and file the document in a timely fashion with the FCC.
 - 4.6.10.1.1. Moved Carl Stephenson on behalf of 802.18
 - 4.6.10.1.2. Discussion
 - 4.6.10.1.2.1. What is it? An opposition to petition for rulemaking.
 - 4.6.10.1.3. The motion is approved with unanimous consent.
- 4.6.10.2. To approve document 18-03-024r0_Cmts_IB-01-185_IB-02-364_Addtl_2.4GHz_Spectrum.doc, authorizing the Chair of 802.18 to do necessary editorial and formatting changes, seek SEC approval as an 802 document, and file the document in a timely fashion with the FCC.
 - 4.6.10.2.1. Moved Carl Stephenson on behalf of 802.18
 - 4.6.10.2.2. Discussion
 - 4.6.10.2.2.1. This is about re-possession of spectrum from LEO operators. We are supporting taking this spectrum.
 - 4.6.10.2.3. The motion is approved with unanimous consent.

- 4.6.10.3. The WG chair notes that there may be an SEC motion to issue an award to Carl Stephenson. The WG chair supports this motion, and will vote accordingly. Is there any dissent? None. The group acclaims Carl's work and supports the motion.

4.7. Liaison Reports

4.7.1. 802.11i to 802.1

- 4.7.1.1. None

4.7.2. 802.11 to 802.15 – Mike Seals

- 4.7.2.1. Report in document 03/254r0
- 4.7.2.2. TG2 did not receive enough votes, but got the votes during the meeting. 43 yes, 2 no, return rate of 76%. 96% approval. Will have sponsor ballot recirc. Will use procedure 10 to forward to RevCom
- 4.7.2.3. TG3 addressed all 67 comments from 2nd sponsor ballot. Accepted 47 resolutions. Will have 15 day recirc on draft 17, and use procedure 10
- 4.7.2.4. TG3a there were 23 proposals, and some downselection edits. Proposal refinement will take place, and a new presentation before downselection
- 4.7.2.5. TG4 sponsor ballot had 100% approval. Standard will be finished by end of May.
- 4.7.2.6. Low power UWB SG – they decided to not form a study group. Restricting to UWB was too restrictive.
- 4.7.2.7. SG 15.1a was formed this week in response to errata in the 15.1 standard, an in response to updates in BT from the Bluetooth Sig. The group voted to form the study group. There are concerns that the SIG does not work within the IEEE rules.
- 4.7.2.8. Discussion
 - 4.7.2.8.1. Was there a large body in SG3a? We don't have a count – there were over 220 attending.

4.7.3. Jedec JC61 – Tim Wakeley

- 4.7.3.1. Report in document 03/255r0
- 4.7.3.2. Last meeting was March 6-7, elected Bill Carney as vice chair. Processed comments on RF-baseband. RF baseband editor will revise and resubmit before May. Will have U/L MAC proposal finalized for consideration. Will submit regulatory considerations. Next meeting May 7-8 in San Francisco.
- 4.7.3.3. Discussion
 - 4.7.3.3.1. How many attendees last week? Generally 20-22 companies attend.

4.7.4. WNG to 3GPP

- 4.7.4.1. Document 03/226
- 4.7.4.2. Document 03/240
- 4.7.4.3. WFA document 03/244 on public access

4.7.5. 802.11i to IETF - Dorothy Stanley

- 4.7.5.1. Document 264r0
- 4.7.5.2. IETF develops Internet standards. We have a liaison for 802.11i for authentication and key-management which is in the scope of IETF. Requests are in document 02/040.
- 4.7.5.3. In document 03/243, we submit an additional letter.
- 4.7.5.4. IETF has responded, and formed a new working group, updating base EAP specification.
- 4.7.5.5. The IETF will review use of RADIUS in TGf. 802.1x is a precedent for use of RADIUS in an 802 standard.

4.7.6. 802.11 to MMAC - Yashohiko Inoue

- 4.7.6.1. Report in document 03/245r0
- 4.7.6.2. Review of MMAC organization – wireless standards in Japan.
- 4.7.6.3. Revision of ARIB standard T71 to incorporate 5GHz underway. Two meetings so far. Have draft of T71 version 2. Desire to coordinate with TGj.
- 4.7.6.4. Third meeting is next week.

4.7.7. 802.19 report – Jim Lansford

- 4.7.7.1. Report in 802.19 document 03/11r0
- 4.7.7.2. Held officer elections this week. Updated charter and operating rules. Will recirculate on email. Presented in 802.15.3a.
- 4.7.7.3. 802.19 will help with 802.15.3a coexistence criteria. Will review in May interim.
- 4.7.7.4. Had a presentation on a UWB discovery protocol.
- 4.7.7.5. Had chair of TR41 discussing spectrum etiquette between cordless phones and WLANs.
- 4.7.7.6. Presentation to HTSG on coexistence process, corresponding to procedure in 802.15.3a.
- 4.7.7.7. Will work with 802.18 on spectrum etiquette.
- 4.7.7.8. Will have an ad-hoc meeting between now and May on Guideline document.
- 4.7.7.9. Discussion
 - 4.7.7.9.1. Is Mat Sherman willing to represent the position of 802.11 in the SEC committee on coexistence? Yes, Matt accepts the role. Does the body object to Mat acting in that capacity? No objection to Matt Sherman taking that role.

4.8. *New Business*

4.8.1. TG Chair Selection for High Throughput

- 4.8.1.1. Any new nominees for the future Task Group N?
- 4.8.1.2. None
- 4.8.1.3. Nominations are closed.
- 4.8.1.4. We will follow procedures for officers elections – each candidate will make a statement.
- 4.8.1.5. We will do a standing vote.
- 4.8.1.6. A simple majority is required.
- 4.8.1.7. Since there are three candidates, there will be 5 minutes given for each. Any objection? None
- 4.8.1.8. After the statements, there will be questions to the candidates.
- 4.8.1.9. Do the candidates want extra time afterward? Matthew: Questions during. Bruce, Mika, also support questions during.
- 4.8.1.10. There will be one round of voting. The lowest will drop off. Then there will be an additional 2 minute statement. Then another vote, with the winner with simple majority.
- 4.8.1.11. Suggestion – that we follow the procedure whereby as soon as a candidate reaches a simple majority. If no candidate receives a majority, there is a runoff election.
- 4.8.1.12. the WG chair states we will follow that procedure.
- 4.8.1.13. Statements
 - 4.8.1.13.1. Mika Kasslin: Have been involved since 1997. Have worked to harmonize European standards with 802.11a. Have been running TGh, it is a good group to lead, emphasizing good spirit and compromise. Intends the same for the High

- Throughput task group. Ready to go through the entire process whatever it takes. Emphasizes that this is international organization, and ETSI collaboration is good for everybody. The other candidates are also good, and have done a great job.
- 4.8.1.13.2. Discussion
- 4.8.1.13.2.1. What about your existing chair position? TGh is about to finish. We approved a motion to finalize in May meeting. Then will be free.
- 4.8.1.13.2.2. Some task groups have had deep division due to differing market interests. How do you expect to use the chairs position to make sure the standard allows everyone to meet their market needs? Willingness to compromise was seen in TGh. Lets people discuss, perhaps too much, to get a solid technical standard.
- 4.8.1.13.2.3. What is your role in ETSI BRAN? Have been involved in 3-4 years.
- 4.8.1.13.3. Mathew Shoemake: Don't view this as a race- all are qualified. Have been in 802.11 for 5 years. Affiliated with TI in wireless networking. Have gained experience in 802.11g. Have gotten a group through tough times in a successful and fair fashion. Knows the IEEE rules, and how to move forward in the WG, ExCom and IEEE. Committed to having an open process. Will not take part in technical debate, and has no agenda. Would use the position to provide a fair and open playing field for all.
- 4.8.1.13.4. Discussion
- 4.8.1.13.4.1. What about the existing chair position? Will be done with all work in the next two months. If elected would plan on using the vice chair of 802.11g to make enough time for 802.11n.
- 4.8.1.13.5. Bruce Kraemer: Thanks for support in approving the PAR and 5 criteria. This is the result in over a year of work, originating in the WNG committee. This will start another 3 years work for another amendment. Why run for a task group? All the candidates have extensive experience in dealing with the standards process. Have been involved in 802.11, WNG, 5GSG, and creation of 802.15. The role of the chair of the task group is to facilitate the creation of a high quality document. The role of the TG is not to be the source of all knowledge. Will not be the source or judge of proposals. Foresee being a facilitator in creating and refining the process for selection, and downselection. Will conduct the group with decorum, cohesiveness, and collaboration, and enjoyment. All members and would be heard and considered. Look forward to the opportunity to serving.
- 4.8.1.13.6. Discussion
- 4.8.1.13.6.1. What about your existing chair position? Currently as vice chair of WNG. Would relinquish Vice Chair of WNG to serve as HT chair.
- 4.8.1.14. Any additional time required? None
- 4.8.1.15. The WG chair states that there is one vote per candidate.
- 4.8.1.16. Will the candidates be present? No objections.
- 4.8.1.17. Do the rules require a secret ballot? The WG chair says there is not.
- 4.8.1.18. First Round Vote results: 122 in the room. Mika 35, Matthew 55, Bruce 32.
- 4.8.1.19. The vice chairs have confirmed the vote. There are none that reach 50%.

- 4.8.1.20. Any objection to continue beyond our scheduled time to resolve this issue? None.
 - 4.8.1.21. Statements
 - 4.8.1.21.1. Matthew – committed to a fair process.
 - 4.8.1.21.2. Mika – would like to facilitate the process, hope can provide a path towards a fast standard. Wants to help the group create a good standard.
 - 4.8.1.21.2.1. Question – How does cooperation with ETSI bring value to the HT process? We shouldn't create a similar effort to what has been done in Europe. Will invite companies from ETSI to joint our effort.
 - 4.8.1.22. Second Round Vote: 116 votes cast: Mika 39, Matthew 77 (66%).
 - 4.8.1.23. Matthew Shoemake is elected chair of TGn.
 - 4.8.2. Discussion
 - 4.8.2.1. There was a procedural issue on motion on the re-count. The chair was sustained in the appeal. We need to conduct another vote on the motion.
 - 4.8.2.2. Is this a motion to reconsider?
 - 4.8.2.3. No, the process was not completed properly previously.
 - 4.8.3. Call for the orders of the day –
- 4.9. *The meeting is adjourned at 12:05 PM***

Attendance list for the meeting held at **Hyatt Regency DFW, Dallas, TX**

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Tuesday, May 06, 2003

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IEEE P802.11
Wireless LANs

Minutes of 802.11 Task Group E
MAC Enhancements - QoS

Dallas, Texas, USA

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1. Monday Afternoon, March 10, 2003

1.1. Opening

1.1.1. Call to order

1.1.1.1. *John Fakatselis (JohnF) called the meeting to order at 3:45pm (delayed due to meeting room setup).*

1.1.2. Review of the agenda

1.1.2.1. *Tentative meeting schedule: 11-03-138r0-W-802.11-WG-Tentative-Agenda-March-2003.xls*

1.1.2.2. *JohnF reviewed the proposed agenda.*

1.1.2.3. *Fixed time 7:30pm Thursday, 13 March 2003.*

1.1.2.4. *Review minutes from previous meeting*

1.1.2.5. *Call for papers.*

1.1.2.6. *Fixed Time Items are on the agenda.*

1.1.3. Discussion on the agenda

1.1.3.1. *Srini Kandala (Srinik): there is a suggestion for a joint link with TGi, especially on fast roaming and crosslink security*

1.1.3.2. *JohnF: Have discussed that with the TGi chair; can make it a formal request, if that is the will of this group; is there any objection to my making a request for a joint meeting?*

1.1.3.3. *JohnF: I will leave this as tentative until I check with TGi on timing.*

1.1.4. Approval of the agenda

1.1.4.1. *JohnF: Is there any objection to approving this agenda?*

1.1.4.2. *JohnF: I see no objections, so we have an agenda for this meeting.*

1.1.5. Discussion on the letter ballot comment resolutions

- 1.1.5.1. *JohnF: About 1000 comments remain after the Interim Ad-Hoc meeting in Portland.*
- 1.1.5.2. *No comments or objections to this summary.*

1.2. Review of 802.11 policies and rules

1.2.1. Straw Poll

- 1.2.1.1. *JohnF: How many new participants?*
- 1.2.1.2. *JohnF: I count about 8-10 people.*

1.2.2. The chair reviews voting rules and the process (JohnF)

- 1.2.2.1. *Voting membership was reviewed in the 802.11 WG meeting earlier this afternoon.*
- 1.2.2.2. *Votes are for voting members only.*
- 1.2.2.3. *Non-voters are allowed to participate in discussion, at the discretion of the chair. Non-voters cannot bring a motion.*
- 1.2.2.4. *Members are requested to not stall the process by unnecessary use of privileged motions.*
- 1.2.2.5. *Though it is your right to make a point of order, I was very proud that in the last meeting we had no points of order.*
- 1.2.2.6. *Duncan Kitchin (DuncanK): Will the voting tokens be available?*
- 1.2.2.7. *Stuart Kerry (StuartK): Al Petrick will distribute them to the various Task Groups this afternoon.*

1.2.3. Review of Portland Ad-Hoc

- 1.2.3.1. *SriniK: In Portland we resolved 240 technical comments, and had resolved more than 100 in previous Interim meeting*
- 1.2.3.2. *DuncanK: How many more meetings does this mean?*
- 1.2.3.3. *SriniK: About 3 more meetings at this rate. I might be asking later this week for another Ad-Hoc meeting.*
- 1.2.3.4. *John Kowalski(JohnK): Do there have to be formal minutes from Ad-Hoc meetings.*
- 1.2.3.5. *JohnF: Ad-hoc groups do not have to have minutes*
- 1.2.3.6. *JohnK: I will post my minutes from the Ad-Hoc as soon as I can get a document number.*

1.3. Approval of minutes of January Meeting

1.3.1. Request for approval

- 1.3.1.1. *JohnF: Are there any questions or issues with the minutes of the January 2003 meeting in Fort Lauderdale?*
- 1.3.1.2. *JohnF: I hear none. The minutes of January 2003 are approved with unanimous consent.*

1.4. Papers

1.4.1. Call for papers

- 1.4.1.1. *JohnF: What papers are available to be presented?*
- 1.4.1.2. *Matthew Sherman (MatthewS): I have four TBD papers.*
- 1.4.1.3. *JohnK: One paper, 02/427r1, Recommendations for AV over 802.11a.*
- 1.4.1.4. *MarkB: One paper (no number yet), Roaming Improvements*
- 1.4.1.5. *DuncanK: One paper (no number yet): Simplifications to EDCF Admission Control*
- 1.4.1.6. *Javier del Prado (JavierP): 146r1, Direct Link Multicast and one other paper (no number yet)*
- 1.4.1.7. *Richard van Leeuwen (RichardL): one paper (no number yet): EDCF Parameters*

1.4.2. Discussion of papers

- 1.4.2.1. *JohnF: I count about 10 papers*
- 1.4.2.2. *MatthewS: About 15 minutes each*
- 1.4.2.3. *JohnF: Will budget 10 minutes each for discussion.*
- 1.4.2.4. *MatthewS: Or 5 minutes discussion.*
- 1.4.2.5. *JohnF: Is anyone ready to present today?*
- 1.4.2.6. *MarkB: Can present today.*
- 1.4.2.7. *SriniK: Can present tomorrow*
- 1.4.2.8. *JohnK: Can present tomorrow*

1.4.3. Discussion of procedures for handling comments

- 1.4.3.1. *JohnF: To review, we have divided and conquered the comments by dividing up into ad-hoc groups that each cover chunks of comments; had 4-5 such groups last time. So I suggest doing the same this time. But is there any discussion of this process? I'd like to leave it up to the ad-hoc groups to decide how to tackle their group of comments; most groups last time left some issues to the overall TG.*
- 1.4.3.2. *JohnK: I think there is so much low hanging fruit that we should devote pretty much all the ad-hoc time to that, and would personally favor to decline every comment that is marked red (controversial) right now. These issues have gone on for three years.*
- 1.4.3.3. *MatthewS: I agree that the controversial topics should not be done in the ad-hocs, and that we can accomplish low hanging fruit for now. But we are obliged to respond to every comment.*
- 1.4.3.4. *JohnF: We are obligated to*
- 1.4.3.5. *JohnK: What I meant was that we do respond to each comment, but that we state why they are being rejected.*
- 1.4.3.6. *DuncanK: Agree with most of these points, so suggest first to create an ad-hoc group to block out the red comments, then we have special orders to discuss and vote on those comments in the TG. Then the direction from the TG will be to direct an ad-hoc group to [advise on resolving those comments].*
- 1.4.3.7. *JohnF: Please consult with me before we propose to modify the agenda.*
- 1.4.3.8. *Keith Amann (KeithA): have spent 15 minutes talking about addressing comments; we do need to start addressing the comments. But I believe that not all comments that are marked red are controversial, just that some ad-hocs believed that they had insufficient population to make a judgment.*
- 1.4.3.9. *MatthewS: Agree with the other comments, and agree that we might just decide to decline many of the comments marked red. One change to DuncanK's*

proposal is to complete the low hanging fruit first before debating the issues marked in red.

- 1.4.3.10. *JohnK: Many of those “controversial” topics have already had a fair hearing, so I believe that we go through them relatively quickly.*

1.4.4. Review of Recirculation Rules

- 1.4.4.1. *JohnF: I ask JohnK to bring up the document he assembled during the last meeting on the relevant text from the 802 Operating Rules on Recirculation Ballots, 802.11-02/130r0 .*
- 1.4.4.2. *JohnF: {Reviewed that document} Using that guidance, I would like to divide the comments into several ad-hoc groups, one of which is on the red-marked comments. Then it is up to the separate ad-hoc groups*
- 1.4.4.3. *JohnK: I’m confused because of the fact that we have not identified all the red-marked comments yet. Also, many of the red-marked comments can be declined directly, such as “Is EDCF mandatory?”*
- 1.4.4.4. *JohnF: The idea is for this group just to take up the red-marked comments we have identified so far. I think we have enough of those comments that I can feel good about assigning that topic to a single group.*
- 1.4.4.5. *JohnK: You definitely have enough of those comments.*
- 1.4.4.6. *John Fuller: Having attended the ad-hoc in Portland, I suggest that we do need to assign more of the comments. There are many more that need to be assigned.*
- 1.4.4.7. *JohnF: We do have to approve all the resolutions of all comments in the whole TG anyway. I do regard that as a definite alternative to what I have suggested; I suggested the other approach in the interest of time; but I do recognize that the second suggestion is more orderly.*
- 1.4.4.8. *JohnK: I ask Srimi, what are the open sections of the comments; what is the virgin territory that remains?*
- 1.4.4.9. *SrimiK: have left out clause 7, much of clause 9, including some of 9.10.2,, Annex A and Annex B.*
- 1.4.4.10. *JohnK: Clause 7 and clause 9.10.2 might be intertwined.*
- 1.4.4.11. *SrimiK: Don’t believe they are that intertwined.*
- 1.4.4.12. *Harry Worstell: the TG is required to respond to every individual comment. Else could go to RevCom and be bounce back to where we are today.*
- 1.4.4.13. *DuncanK: I believe that we haven’t suggested doing that; we are just talking about procedures of coming to a decision, not about writing the responses.*
- 1.4.4.14. *JohnF: To summarize, we have two alternative way: work first on the ones that are categorized first; or to work first on categorizing all of the other comments first. Summary:*
- 1.4.4.14.1. *1. Define Groups of Comments; assign Ad-hoc teams per group of comments; ad-hoc groups to suggest the best way of approving their resolutions. (JohnF: it is up to each group how to proceed about their comments.)*
- 1.4.4.14.2. *2. Review all technical comments as a TG; separate comments into groups as TG; then assign/instruct ad-hoc groups to resolve the comment groups.*
- 1.4.4.15. *SrimiK: Another suggestion would be to treat all as TG*
- 1.4.4.15.1. *3. TG to resolve all comments without necessarily any ad-hoc groups*
- 1.4.4.16. *DuncanK: At last meeting that we had anything to do with PICS is directed to the Task Group.*
- 1.4.4.16.1. *4. As of the January meeting, except anything that has to do with PICS or 9.10.2.4.2 will be dealt with by an ad-hoc group after a*

- direction has been determined by the TG. (Same as 1, but with exceptions.)
- 1.4.4.17. Sid Schrum (SidS): (1) I believe that we need to break up into groups to make progress; and (2) the groups need to identify their red-marked comment subjects, and to summarize the issues to the TG about those red-marked comments.
- 1.4.4.18. JohnF: Is this an argument for option 4?
- 1.4.4.19. SidS: I also believe that we need to both go for low-hanging fruit, and also to airing the subjects for the red-marked comments. Need those activities to happen in parallel. Also, if no resolution in 10 minutes, to bring those subjects up later. I think this is a refinement of Number 1.
- 1.4.4.20. Srinik: Sid's suggestion applies to Number 4 as well.
- 1.4.4.21. JohnF: Reviewed the idea behind number 1: it is up to the ad-hoc groups to make a suggestion what to do with the red-marked comments.
- 1.4.4.22. SidS: I'm adding that the ad-hoc groups need to make an effort to categorize the red-marked comments into subjects and to describe the issues with each of those subjects, labeling how many comments there are related to this subject.
- 1.4.4.23. DuncanK: I call the question.
- 1.4.4.24. JohnF: There's no motion.
- 1.4.4.25. JohnK: Question about number 4: If the TG is not going to make a technical change, is it correct that we will
- 1.4.4.26. DuncanK: Yes. Based on Sid's suggestion, this means the ad-hoc groups will partition the red-marked comments into separate buckets and presents that to the TG. So I accept Sid's addendum to Number 4. Here's the new version:
- 1.4.4.26.1. 4. Add to Number 4: Each ad-hoc group, for each comment, will either determine a resolution to it unanimously adopted by the ad-hoc, or a resolution widely agreed but not unanimously, or declare the comment to be controversial and mark it in red. The leader of each ad-hoc group is then responsible for partitioning the red comments by subject. The ad-hoc group leader is then responsible for presenting to the TG:
- 1.4.4.26.2. a) All of the unanimously resolved comment resolutions for approval
- 1.4.4.26.3. b) Each widely agreed comment individually
- 1.4.4.26.4. c) Each subject block of red comments, with a request for direction from the TG.
- 1.4.4.26.4.1. Each subject block of red comments, the TG will then agree a position, and the ad-hoc group will be instructed to formulate comment responses to the individual comments according to that direction. Those resolution must then be brought back to the TG for final ratification.
- 1.4.4.27. MatthewS: When did we do the widely-agreed comments?
- 1.4.4.28. DuncanK: At least we did that in some ad-hocs during the last session.
- 1.4.4.29. MatthewS: So can agree with that process?
- 1.4.4.30. JohnK: We need a procedure for the ad-hocs to be set up
- 1.4.4.31. DuncanK: I'm assuming that the ad-hoc groups we had in January are still in existence.
- 1.4.4.32. JohnK: As long as we can do the new material first...
- 1.4.4.33. SidS: Need some additions on procedures.
- 1.4.4.34. DuncanK: Add the sentence to number 4:
- 1.4.4.34.1. The ad-hoc group leaders will also work amongst themselves to merge blocks of red comments that span multiple ad-hoc groups where possible.

- 1.4.4.35. *SriniK: There are some comments that conflict with things that were already approved.*
- 1.4.4.36. *JohnF: Those things we have settled and will not change.*
- 1.4.4.37. *SidS: What do we do about resolutions that don't get 75% approval?*
- 1.4.4.38. *JohnF: There will be those, and we can't officially do anything about them.*
- 1.4.4.39. *SidS: But a rejection is a resolution. Can the chair unilaterally decide? Or can the TG just decide to do nothing?*
- 1.4.4.40. *JohnF: All changes to the draft require a 75% approval. What we're trying to do here is just to accelerate the process. We will make a attempt to do this. But anyone has the right to take a comment out of its assigned bucket. You don't have to accept the groupings of the comments.*
- 1.4.4.41. *SidS: At what point do we decide to reject a group of comments?*
- 1.4.4.42. *JohnF: Since the draft is approved, we would then just answer the comment without changing the draft. Then hopefully we will accept those as a group.*
- 1.4.4.43. *MatthewS: I generally agree, but every comment that is technical has to have a response that reaches a 75% vote. Personally, I don't believe we will have a problem getting that, since people are tired of the same old arguments again.*
- 1.4.4.44. *DuncanK: For one comment, if can't get 75% on any resolution, then can [move on to other issues].*
- 1.4.4.45. *DuncanK: Suggest 50% procedural vote on these being the options.*
- 1.4.4.46. *JohnF: Is there any objection to this list of options?*
- 1.4.4.47. *JohnF: Is there any objection to taking up the processes listed in Option 4?*
- 1.4.4.48. *JohnF: I see no objection. So that's what we'll do.*

1.4.5. Recess

- 1.4.5.1. *JohnF recessed the meeting at 5:30, until the 7:00pm meeting.*

2. Monday Evening, March 10, 2003

2.1. Opening

2.1.1. Call to order

- 2.1.1.1. *JohnF called the meeting to order at 7:05pm.*

2.2. Presentation of Papers

2.2.1. Document 03/196r1, Roaming Improvements, Mark Bilstad

- 2.2.1.1. *MarkB: This is a modification of a presentation given to the Interim Ad-Hoc meeting (document has been on the server, but unnumbered due to problems with the automated document number request server)*
- 2.2.1.2. *Main points:*
- 2.2.1.2.1. *Discovery phase: QoS must be a part of the new AP selection*
- 2.2.1.2.2. *Commit phase: QoS handshakes must not slow this process*
- 2.2.1.2.3. *Required changes: define a "predictor field"; define a new "action" element to allow ADDTS actions to be attached to (re-) association requests and responses; and allow ADDTS action to carry two TSPEC and TCLAS elements.*

- 2.2.1.3. *JohnK: How generalize this for IAPP/TGf and how can you say this will complete in time; and what about multiple TSPEC flows?*
- 2.2.1.4. *MarkB: I don't see problem with multiple flows.*
- 2.2.1.5. *Bob Meier (BobM): A reassociate is just a vehicle to contain this action; there's a predictor that gives you a likelihood that your TSPEC will be accepted; otherwise this proposal is just a vehicle for transport.*
- 2.2.1.6. *MatthewS: I prefer a more centralized control, especially for handoff, though agree that there is a station involvement in this decision.*
- 2.2.1.7. *MarkB: I don't believe that this is an improvement, not exclusive of what you suggest.*
- 2.2.1.8. *MatthewS: But don't see a reason for you to have to do what you're proposing – though see one advantage of your proposal is that an AP can direct you to a specific next AP.*
- 2.2.1.9. *BobM: You can include that in the beacons.*
- 2.2.1.10. *MatthewS: Then why have the probe?*
- 2.2.1.11. *KeithA: Mark is aimed at the commit phase, not the discovery phase.*
- 2.2.1.12. *MatthewS: But the discovery phase is more important.*
- 2.2.1.13. *MarkB: But that is not the focus here.*
- 2.2.1.14. *JavierP: Why is there a delay involved here?*
- 2.2.1.15. *MarkB: Only offering the admission capacity in the TSPEC; the predictor is not the be-all, end-all; AP doesn't have a requirement to admit you.*
- 2.2.1.16. *JavierP: Why not include TSPEC in the probe?*
- 2.2.1.17. *MarkB: It is very important that the probe response come back quickly, since that limits how fast you can scan across channels.*
- 2.2.1.18. *DuncanK: Creating extra [work] unnecessarily.*
- 2.2.1.19. *SriniK: Information element can only be 255 bytes; why not use association response element?*
- 2.2.1.20. *MarkB: Was concerned that would overload the element; but if that's not true, then could agree with that; there also is the problem with what JohnK brought up, the multiple TSPEC flows.*
- 2.2.1.21. *MarkB: Straw Poll: do you agree with the general concept of this information passed in these messages? Yes or No, voters only:*
- 2.2.1.22. *Vote: 15 Yes; 3 No; 11 Abstain*
- 2.2.1.23. *MarkB: Any specific comments on this particular solution?*
- 2.2.1.24. *SriniK: TCLAS can be variable length, with various fields in it, so this element could get to be higher than 255 bytes, so would suggesting a different encoding; just need to think about this.*
- 2.2.1.25. *MarkB: If this is the level we're at, then we can work something out.*
- 2.2.1.26. *CharlesW: The length is fixed.*
- 2.2.1.27. *MarkB: This gets appended to end of the reassociation.*
- 2.2.1.28. *CharlesW: But reassociation is not amenable to attachments.*
- 2.2.1.29. *SriniK: But that is of variable length, so just fits in.*
- 2.2.1.30. *Greg Chesson (GregC): Could be just a one step process, just using information elements; why did you do it this way?*
- 2.2.1.31. *MarkB: The current info elements are not set up for this.*
- 2.2.1.32. *GregC: Why not define a new info element?*
- 2.2.1.33. *MarkB: Just that it didn't fit into the general semantics of the current information elements.*
- 2.2.1.34. *GregC: Another point: sufficient to support DHCP?*
- 2.2.1.35. *SriniK: We can define our own elements.*
- 2.2.1.36. *MatthewS: You reserve capacity on the other AP; already has a good signal from you; so the other AP can pre-reserve capacity for you (because scans other channels and sees you).*

- 2.2.1.37. *JohnK: But will be working on a different channel than it is otherwise working.*

2.3. Discussion of Ad-Hoc Groups

2.3.1. Ad-hoc Work

- 2.3.1.1. *JohnF: Srini, could you list the groups from January?*
- 2.3.1.2. *SriniK: Clause 7 (stream formats); 9.10.1 (EDCF); and the third group was 9.11, but then took over rest of comments on Block Ack; there now is a need for clause 9.10.2, clause 11.2 (APSD); Clause 5.8 (DLP), Annex D (MIB), Annex A (PICS) and 9.10.2.4.2 and, finally, General; and 9.1 (Architecture introduction).*
- 2.3.1.3. *KeithA: Ad-Hoc meeting; what is the game plan about that work.*
- 2.3.1.4. *SriniK: Clause 3 (definitions); Clause 5, except 5.8 (General description); Clause 6 (MAC service definition); Clause 10 (MLME interface); Clause 11.4 (TS setup and teardown).*
- 2.3.1.5. *John Fuller: the document describing the Portland results has been on the server for over four hours.*
- 2.3.1.6. *MatthewS: But server hasn't generally been available – most people haven't been able to get online.*
- 2.3.1.7. *John Fuller: That's not a factor in the requirements.*
- 2.3.1.8. *SriniK: Can combine a number of the groups.*
- 2.3.1.9. *JohnF: SriniK will lead Clause 7 again; DuncanK will take EDCF again; and SidS will take 9.11 and Burst Ack again.*
- 2.3.1.10. *John Fuller / MatthewS: we really can't support more than three groups at a time.*
- 2.3.1.11. *DuncanK: the group leaders are then responsible for creating the subjects for the comments in their areas that still are marked in red.*
- 2.3.1.12. *DuncanK: Will also combine 9.1 in the next EDCF group.*
- 2.3.1.13. *KeithA: Will take Clause 11.2 (APSD), Clause 5.8 (DLP) after the first three are done, and Annex D (MIB).*
- 2.3.1.14. *JohnK: Will take Annex A & 9.10.2.4.2.*
- 2.3.1.15. *SriniK: I can do the General group.*
- 2.3.1.16. *JohnF: Tonight we'll start with the first three groups.*
- 2.3.1.17. *DuncanK: will determine the subject groups for the red marked comments in EDCF and 9.1, so need to work separately from the group at first.*
- 2.3.1.18. *SriniK: need to address the results of the ad-hoc group tomorrow; this includes Clause 3, 5 (except 5.8), 6, 10, 11.4.*

2.4. Recess

- 2.4.1.1. *JohnF: Is there any objection to recess for the ad hoc group meetings? Hearing none, we are recessed for ad-hoc work until 9:30pm.*
- 2.4.1.2. *JohnF recessed the meeting for ad hoc group work at 8:10 pm.*

3. Tuesday Morning, March, 2003

3.1. Opening

3.1.1. Call to order

- 3.1.1.1. *JohnF called the meeting to order at 8:00 am*

3.2. Ad hoc groups

- 3.2.1.1. *JohnF: If there are no special motions, we would like to recess for more ad hoc work.*
- 3.2.1.2. *No objections.*

3.3. Recess

- 3.3.1.1. *JohnF recessed the meeting for ad hoc group work at 3:32pm*

4. Monday Evening, March 10, 2003

4.1. Opening

4.1.1. Call to order

- 4.1.1.1. *JohnF called the meeting to order at 7:10pm*

4.2. Ad hoc group reports

4.2.1. Review of ad hoc group progress

- 4.2.1.1. *JohnF: What do ad hoc groups have to report?*
- 4.2.1.2. *SidS: 47 comments on 9.11; have solved 21 so far.*
- 4.2.1.3. *SriniK: 517 comments; resolved 30 so far.*
- 4.2.1.4. *DuncanK: 157 comments; 3 more were for 9.10, but we determined they should be covered by this group. Have gone through 37; most resolved. 11 are identified as controversial (5 unique topics) to go back to the TG. A couple of others we need to think about. Ones we classified as editorial we made suggestions as to the resolution.*

4.3. Closing

4.3.1. Recess

- 4.3.1.1. *JohnF recessed the meeting for ad hoc group work at 7:16pm.*

5. Tuesday Morning, March 11, 2003

5.1. Opening

5.1.1. Call to order

- 5.1.1.1. *JohnF called the meeting to order at 8:08pm.*

5.2. Comment resolution process

- 5.2.1.1. *JohnF: Three questions:*
 - 5.2.1.1.1. *Do any of the ad-hoc group leaders have issues?*
 - 5.2.1.1.2. *Two of the ad-hoc leaders aren't here. So let's wait on that.*
 - 5.2.1.1.3. *Are there any other papers ready to present today?*
 - 5.2.1.1.4. *Apparently there are none.*
 - 5.2.1.1.5. *Is Srini ready to report on the 140 comments that the Portland Ad-Hoc meeting was able to address?*
 - 5.2.1.1.6. *SriniK: Yes.*

5.2.1.2. *MarkB: I just received the doc number for the paper I presented last night: 196/r0.*

5.2.1.2.1.

5.2.2. Report on Proposed Resolutions from the Portland Ad-Hoc Meeting

5.2.2.1. *Document number 11-03-020r5-E-Merged_Letter_Ballot_51_Comments.xls*

5.2.2.2. *JohnF: This report will cover the principal half dozen or so comment resolutions. Everyone please read the proposed resolutions of the other comment resolutions and bring up any that you take exception to.*

5.2.2.3. *{Secretary: Only a few of the highlights of Srini's commentary follow.}*

5.2.2.4. *SriniK: There is only one comment that we marked in red. {Described the proposed resolutions to Clauses 3.64-3.74} New definition of "link" as "in relation to any IEEE 802.11 MAC entity, a physical path used to transfer MSDUs to a peer MAC entity, including exactly one traversal of the wireless medium."*

5.2.2.5. *David Hunter(DavidH): One traversal includes the Ack?*

5.2.2.6. *SriniK: The definition is about one MSDU; the Ack happens because of the MSDU.*

5.2.2.7. *SriniK: Clause 5.8, Direct Link Protocol proposed resolution: replace "for a duration of aDLPTimeout" with "until the direct link becomes inactive". In Clause 10 the editor will add parameters to the service primitives, where appropriate. We had many proposed comment resolutions for Clause 10.3.11-13, the vast majority of which were accepted. MLME-DLP.confirm is being overloaded (used in separate contexts), and those uses will be separated. For 10.3.13.1.3 the capability of the QAP to initiate a DLP has been removed. For 10.3.15 the comment to remove the MLME interface definition was rejected. In several places in 11.4 "TSPEC" was used when "TS" was meant. In 11.4.1 the comment to reject the setup of two TSeS for one stream was rejected because having multiple hops would increase management complexity.*

5.2.2.8. *SriniK: In 11. the question about definitions being normative was accepted in part; the definitions are normative, but the word "shall" is being removed.*

5.2.2.9. *CharlesW: So is the same being done for all definitions.*

5.2.2.10. *SriniK: I believe there are no "shall"s in any of the other definitions.*

5.2.2.11. *SriniK: In 11.xx we put "use priority" back into the text, for clarification.*

5.2.2.12. *SriniK: For 11.xx the comment to put in a packet-based error correction mechanism was rejected in favor of supporting upper level mechanisms.*

5.2.2.13. *JohnF: Any comments, questions? Hearing none, is there any objection to hearing a motion, or do you need more time to review?*

5.2.2.14. *Q: I would like more time.*

5.2.2.15. *JohnF: Let's try to do it in the next section of this meeting, after the recess.*

5.2.3. Ad-hoc group reports

5.2.3.1. *JohnF: I would like to hear from the chairs of the Ad-Hoc groups.*

5.2.3.2. *SriniK: We have covered about 20 comments.*

5.2.3.3. *CharlesW (reporting for SidS's group): We went over a number of the comments marked in red and will be going over*

5.2.3.4. *MatthewS (reporting for DuncanK's group): We went over 8 comments and addressed new material in 9.10, but were delayed by the computer crash of Duncan's machine (caused by his IT department remotely downloading a security patch while he was working on the machine).*

5.2.3.5. *JohnF: The goal is to achieve the currently allocated comments today. After the break we will have a motion on the proposed resolutions by the Portland*

Ad-Hoc meeting, so please review those resolutions before the next session of this meeting.

5.2.4. Recess

5.2.4.1. *JohnF recessed the meeting for the break at 9:52am.*

5.3. 10:30am

5.3.1. Call to order

5.3.1.1. *JohnF called the meeting to order at 10:30am.*

5.3.1.2. *JohnF: Before we entertain a motion, are there any comments on the proposed resolutions?*

5.3.1.3. *MatthewS: Just for clarification, will the motion only be about the comments marked in green in this section?*

5.3.1.4. *JohnF: Yes, just the comments and resolutions that Srini reviewed this morning. I see no further comments, so we'll entertain the motion now.*

5.3.2. Motion on the proposed resolutions from the Portland Ad-Hoc meeting

5.3.2.1. *SriniK: Move to accept the resolutions that re color-coded green and yellow in 03/020r5 and instruct the editor to incorporate the recommended changes into the draft.*

5.3.2.2. *MatthewS: What comments are marked yellow?*

5.3.2.3. *SriniK: The only yellow comment is comment 1819. The proposed resolution is to decline the comment, pending the author proposing a specific error-correction mechanism.*

5.3.2.4. *JohnK: Second the motion.*

5.3.2.5. *Vote (technical): 31:0:1*

5.3.2.6. *JohnF: I congratulate the Ad-hoc group for their hard work; it was worth the effort.*

5.3.3. Ad-hoc group reports

5.3.3.1. *SidS: In the Block Ack there are two comments marked red, and both have related presentations. We would like to bring these presentations before we discuss these topics.*

5.3.3.2. *JohnF: Planning: tomorrow our meetings are 1:00-3:00pm and 3:30-5:30pm. So someone can put their presentations on the server in the morning. My guidance is to concentrate our work on the low hanging fruit first, resolve as many comments as possible, and then get to the more complex issues later.*

5.3.3.3. *JohnK: I have reviewed 9.10.2 and Annex A; in addition, some of the "General" comments are related to these. I believe that, as soon as I am done classifying the comments, I can make a recommendation.*

5.3.3.4. *JohnF: I encourage people to work on their proposals so that we can have a discussion tomorrow. Tomorrow at 1:00pm bring in your proposals, especially the leaders to bring in their proposals on their red-marked comments. Overall our resolution rate is way too slow – at this rate it would take 4-5 sessions (over a year) to finish, so we need ways to accelerate our progress. Any comments?*

5.3.3.5. *JavierP: I have one of my presentations ready.*

5.3.4. Paper Presentation**5.3.5. Document 03/146r2: Direct Link Multicast Streaming Proposal, Javier del Prado**

- 5.3.5.1. *JavierP: Sid was involved in working this out?*
- 5.3.5.2. *GregC: Does this include anything about multicast security.*
- 5.3.5.3. *JavierP: No.*
- 5.3.5.4. *JavierP: The main issues are related to ToDS, TSPEC, PHY rate, Power Save,.... The proposed solution is to set the ToDS field to zero in frames with a multicast destination address.*
- 5.3.5.5. *GregC: The AP has to forward multicast, so what does it do with that?*
- 5.3.5.6. *JavierP: That will be covered in the following presentation.*
- 5.3.5.7. *GregC: There's no real problem with TSPEC; if video, once you get the bandwidth, you don't care if it's multicast.*
- 5.3.5.8. *JavierP: This is only about direct link.*
- 5.3.5.9. *GregC: So you don't have to do anything there. But the DLP protocol doesn't work with multicast – you still need to find out who your receivers are.*
- 5.3.5.10. *JavierP: Could leave that up to higher layers. Similarly with Reliability – leave it to higher layers.*
- 5.3.5.11. *JavierP: The detailed solution about ToDS includes a new bit to indicate – in QoS frames the order bit or a bit in the control field are candidates.*
- 5.3.5.12. *GregC: Suggest a poll to see if it would be better use a bit in the MIB – to not forward unless a MIB variable allow it. So, if people want this, should it be packet-by-packet or handled in general.*
- 5.3.5.13. *JavierP: I believe it should be handled packet-by-packet.*
- 5.3.5.14. *GregC: So that's more work.*
- 5.3.5.15. *CharlesW: So it's packet-by-packet because the ToDS bit is 0.*
- 5.3.5.16. *GregC: So inventing IGMP in layer two?*
- 5.3.5.17. *SriniK: There is GMRP in layer two.*
- 5.3.5.18. *CharlesW: it might still be a good idea to have a gross on-off switch like GregC suggested.*
- 5.3.5.19. *MatthewS: If you set that bit, wouldn't it be broadcasting that bit, defeating the DLP process.*
- 5.3.5.20. *GregC: But AP should halt that.*
- 5.3.5.21. *MatthewS: But need to spell that out.*
- 5.3.5.22. *CharlesW: The frame should stay in the BSS unless the AP looked at a bit that indicates forwarding.*
- 5.3.5.23. *MatthewS: But could forward if saw 0 bits.*
- 5.3.5.24. *CharlesW: Could add the behavior of the From and ToDS bits are 0, then should do that.*
- 5.3.5.25. *JohnF: How about finishing the presentation and then taking questions?*
- 5.3.5.26. *JavierP: Described Power Save behavior, issues about buffering of the QoS multicast frames in the AP, and followed the proposal earlier by SidS in 03/102r0) and filtering according to 03/089r0.*
- 5.3.5.27. *SriniK: If you want the frame sent to the DS, should the AP be included in the group address.*
- 5.3.5.28. *JavierP: Shouldn't be necessary.*
- 5.3.5.29. *SriniK: Believe it breaks multicast.*
- 5.3.5.30. *SidS: Technically the AP will forward the DS, so retransmission comes from the DS, so the AP doesn't know what the source of the frame is. There will be an architectural issue about the AP overriding the bits in the frame; practically it will be messy architecturally.*

- 5.3.5.31. *GregC: I agree with what Sid said; but also need to remember repeaters. If the frame is received through a bridge, not so easily detectable. Bridges will be used a lot in the home environment, so it will be an important issue to address.*
- 5.3.5.32. *Bob Meier(BobM): Why isn't it sufficient to [use IP snooping?]*
- 5.3.5.33. *GregC: Need to control APs.*
- 5.3.5.34. *BobM: Snooping? Joining the multicast?*
- 5.3.5.35. *GregC: Doesn't work unless all join.*
- 5.3.5.36. *BobM: Everybody uses IP snooping today – that's sufficient today.*
- 5.3.5.37. *GregC: That works for wired address, but doesn't help AP to decide about rebroadcasting on its local channel.*
- 5.3.5.38. *JavierP: Need still to verify.*
- 5.3.5.39. *GregC: Could stipulate that AP not forward unless it is using IGMP.*
- 5.3.5.40. *JavierP: Straw poll: do you support the general concept from this presentation, allowing Direct Link Multicast? Voting members only.*
- 5.3.5.41. *JohnF: Vote: 25:0:8 so it seems a generally liked approach, so do use that as guidance in resolving the comments.*
- 5.3.5.42. *JavierP Straw poll: To determine the behavior of AP regarding multicast forwarding to DS:*
- 5.3.5.42.1. *Using extra bit in Frame Control or QoS control field;*
- 5.3.5.42.2. *Use GMRP*
- 5.3.5.42.3. *Both*
- 5.3.5.42.4. *None of the above/Other*
- 5.3.5.42.5. *Abstain*
- 5.3.5.43. *JavierP: only voters may vote, but allow more than one vote per voter*
- 5.3.5.44. *JohnK: The vote is 4:7:2:7:8.*
- 5.3.5.45. *JohnK: If you make a motion, then specify the comments that are related to your proposal.*
- 5.3.5.46. *JavierP: Will do that.*
- 5.3.5.47. *CharlesW: I abstained because I think this needs to be worked out more.*
- 5.3.5.48. *JavierP: I agree, this needs more work.*
- 5.3.5.49. *JohnF: Any more papers? Seeing no response, then we will recess for ad-hoc group work. Recessed at 11:22 for ad-hoc groups.*

6. Wednesday Afternoon, March 12, 2003

6.1. Opening

6.1.1. Call to order

- 6.1.1.1. *JohnF called the meeting to order at 1:07pm*

6.2. Ad hoc group reports

6.2.1. Process review

- 6.2.1.1. *JohnF reviewed the process of moving on to the red marked comments and related motions*
- 6.2.1.2. *JohnK: will also present 03/127r1 at that time*

6.2.2. Clause 7 ad-hoc comment resolutions group

- 6.2.2.1. *SriniK: Currently have resolved only about 5 comments, but have covered about 15 more comments*
- 6.2.2.2. *CharlesW: There are about 5-6 red marked comments in the Block Ack group, and only a few more others, so when we treat the red marked comments in this meeting this group will have finished.*
- 6.2.2.3. *JohnF: How can we make better progress?*
- 6.2.2.4. *MatthewS: I propose we need another [interim] ad-hoc [meeting]*
- 6.2.2.5. *JohnF: I don't understand why the Interim Ad-Hoc meeting was so much more effective than we are here. The same smart people are involved in both.*
- 6.2.2.6. *MatthewS: We're in these sessions only for two days, and there is a lot other things going on in this session.*
- 6.2.2.7. *KeithA: We're splitting a lot of the active body with the other groups; also in the ad-hoc we were very dedicated to moving through the comments.*
- 6.2.2.8. *SriniK: Agree with both Matt and Keith, plus we don't have much time here to work.*
- 6.2.2.9. *JohnF: Can SriniK review the comments that his group has covered and make a motion about them?*
- 6.2.2.10. *SriniK: There were only 5 comments that were settled: 670, 404, 479, 480 and 1053. Comment 670 was declined; we thought 8 msec is sufficient. Setting TXOP limit field to 0 allows longer TXOP durations.*
- 6.2.2.11. *Amjad Soomro (AmjadS): How should the fragmentation work?*
- 6.2.2.12. *SriniK: We could add the fact that longer TXOPs can be handled by dynamic fragmentation; am doing that here.*
- 6.2.2.13. *BobM: No retries on these?*
- 6.2.2.14. *SriniK: No retries.*
- 6.2.2.15. *MatthewS: Does it actually say that no retries are allowed?*
- 6.2.2.16. *SriniK: {Reviewed the text from Draft 4.2, section 7.1.3.5.} By the way, the reference here to 9.10.2.3 is a dangling reference, there's nothing there.*
- 6.2.2.17. *BobM: Can add something there; it should be covered in the HCF not EDCF areas.*
- 6.2.2.18. *JohnF: Are there any objections to accept the resolution as shown. Seeing no objections, this resolution has passed.*
- 6.2.2.19. *SriniK: Next topic, comment 101, about 7.1.3.5.1, was reclassified as editorial – will bring back the term "User Priority"*
- 6.2.2.20. *CharlesW: Is "User Priority" defined someplace?*
- 6.2.2.21. *MatthewS: It is important that we be consistent with other 802 documents, especially 802.1d. Since we refer to that document we should be using that terminology.*
- 6.2.2.22. *JohnF: Are there any objections to accept the resolution as shown? Seeing no objections, this resolution has passed.*
- 6.2.2.23. *SriniK: The next, comment 103, is also about 7.1.3.5.1, and is also classified as editorial. This information is already in 6.1.1.2, but don't see any need to remove that information here.*
- 6.2.2.24. *JohnF: Are there any objections to accept the resolution as shown? Seeing no objections, this resolution has passed.*
- 6.2.2.25. *SriniK: The next comment, 480, is about the title of the caption of the table in 7.1.3.5.2. This should be corrected, so we accepted it and classified it as editorial.*
- 6.2.2.26. *JohnF: Any edits to this resolution? Are there any objections to accept the resolution as shown? Seeing no objections, this resolution has passed.*
- 6.2.2.27. *SriniK: The last comment, 1053, is about the "No acknowledgement" policy. We accepted this comment, and copied the text about multicast frames*

into this section. This is not in clause 9.2 because we wanted to cover more than DCF.

- 6.2.2.28. JohnF: Any edits to this resolution? Are there any objections to accept the resolution as shown? Seeing no objections, this resolution has passed.
- 6.2.2.29. AmjadS: Would like to review the consequences of the first comment. In clause 9.10.2.4, line 15 of Draft 4.0, new text needs to be added.
- 6.2.2.30. Srinik: I'll plan to add this, but we can discuss it later when we talk about 9.10.2.4.

6.2.3. Block Ack ad-hoc comment resolutions group

- 6.2.3.1. SidS: To review: in Fort Lauderdale we handled a lot of the comments, then more in Portland. Finally in reviewing the Block Ack comments we found that most of the comments had been completed. Only two more non-red-marked comments remain. Comment 253 about Ack policy: commenter wanted to be able to request only to set up a connection if the target could satisfy the requested policy. We declined this because there is the alternative of the requester requesting a connection, but then immediately tearing down if it don't like the choices given to it. Any comments on this particular resolution?
- 6.2.3.2. JohnF: Any edits to this resolution?
- 6.2.3.3. Ali Raissinia(AliR): If the requester asks for resources on the target, does the target actually allocate those resources at that time?
- 6.2.3.4. SidS: I believe the answer is yes: you typically ask for buffers from a pool of buffer.
- 6.2.3.5. AliR: But how does the target work here?
- 6.2.3.6. SidS: Once the session is finished, the target will put those buffers back into the pool, anyway.
- 6.2.3.7. JohnF: Again, are there any edits to this resolution? Are there any objections to accept the resolution as shown? Seeing no objections, this resolution has passed.
- 6.2.3.8. SidS: Comment 1677, about no definition of "when the originator is ready to receive an Ack". The commenter wanted to remove Block Ack altogether. We declined that, but offered an alternative resolution that really is a suggested editorial change to remove the "when is it ready" phrase. Any questions?
- 6.2.3.9. JohnF: Again, are there any suggested edits to this resolution? Are there any objections to accept the resolution as shown? Hearing no objections, this resolution has passed.

6.2.4. Review of clause 7 red-marked comments

- 6.2.4.1. JohnF: Let's move on to the red-marked comments. Start with Srinik's Clause 7 group.
- 6.2.4.2. Srinik: Comments 144 etc. (6 comments) are all about how you handle sequence numbers; see clause 7.1.3.4.1, line 9 of Draft 4.0. Part of the problem is that the reference to 7.2.3 doesn't point to anything about how to assign sequence numbers. In Fort Lauderdale we came up with the idea of implementing multiple counters, but only need one sequence counter if you don't implement Group Acks; but with Group Acks, a separate sequence counter shall be used for each Group Ack agreement.
- 6.2.4.3. MatthewS: Is it optional that you don't have to implement the sequence counter?
- 6.2.4.4. Srinik: You have to implement at least one.
- 6.2.4.5. MatthewS: What if not in sequence.
- 6.2.4.6. Srinik: Out of order within the same TID is not going to happen. We also wanted to also keep Block Acks simple.

- 6.2.4.7. SidS: *I believe there would be an advantage of a minimum of one sequence counter per TID. A single sequence number could roll over. The other comment is that there is concern about one sequence counter per group Ack session; you have to know it is a group Ack frame. If go to one bit, you don't know explicitly the context of the frame. Take case where originator still thinks he has the session, but target doesn't have that. Can be a problem when interleaving from multiple packets.*
- 6.2.4.8. Srinik: *It would be fine with me if the group required one sequence number per TID.*
- 6.2.4.9. CharlesW: *I think it's a bad idea to allow the sequence number to be set to "any value", in Draft 4.2.*
- 6.2.4.10. Srinik: *We allowed this because its only about broadcast/multicast frames.*
- 6.2.4.11. CharlesW: *Why not setting to 0?*
- 6.2.4.12. Srinik: *That was the comment, but someone pointed out that it could be any number.*
- 6.2.4.13. Srinik: *(To JohnF:) What do we do about topics that have been decided before?*
- 6.2.4.14. JohnF: *You can always introduce another motion.*
- 6.2.4.15. CharlesW: *I'll make a motion later.*
- 6.2.4.16. JohnF: *Are there objections to the proposed resolution?*
- 6.2.4.17. SidS: *We can ask if there are any objections to making it one sequence number per TID?*
- 6.2.4.18. Srinik: *I'd like to work out the wording together and bring it back to the floor later?*
- 6.2.4.19. SidS: *Fine.*
- 6.2.4.20. JohnF: *Are there any other motions ready to be made about the red-marked comments? I'd like the group to give you direction about these comments.*
- 6.2.4.21. Srinik: *It turns out I have two more comments with proposed resolutions. Comment 290 on 2-bit Ack policy. Our recommendation is to accept the comment to go to a 1-bit Ack policy.*
- 6.2.4.22. SidS: *I believe that the reason for the two bits has gone away; but two bits may be useful for keeping the sequence numbers from getting confused. If you do this, then I'll ask to change how you do sequence numbers.*
- 6.2.4.23. GregC: *Why do you need to know what the sequence number space is before you can interpret the Ack?*
- 6.2.4.24. SidS: *You have to know this frame came in as a multicast.*
- 6.2.4.25. KeithA: *This is interesting because today there is no way for prioritized traffic to request a No-Ack policy – can do with TSPECs, but not prioritized.*
- 6.2.4.26. GregC: *Can set that up, but can't control it. Can do it for Group Acks today.*
- 6.2.4.27. KeithA: *Can do that with TSPECs today.*
- 6.2.4.28. GregC: *That covers two of the three cases: have Ack, don't have Ack but do have TSPEC, or don't have either. You're in trouble only if you want to do Group Ack without QoS control.*
- 6.2.4.29. SidS: *People are saying that want to negotiate the Ack.*
- 6.2.4.30. GregC: *So you're saying that you can't cover that many cases with one bit. Since there is more than one way out of this, I think we need to discuss this more in the ad-hoc group.*
- 6.2.4.31. MatthewS: *Is there still a GroupAck sequence number?*
- 6.2.4.32. Srinik: *No. There are control frames, starting sequence controls.*
- 6.2.4.33. Jim Leung (JimL): *That's the starting sequence. After deleting that other bit, you have to search the whole list before you can detect it's a no-Ack.*

- 6.2.4.34. *SriniK: How about a straw poll to see if one bit or two?*
- 6.2.4.35. *JimL: What's the purpose of removing this bit?*
- 6.2.4.36. *SriniK: At one time we thought we had no reserve bits left. But now we have one other reserve bit, so not as important. The proposed resolution is to remove one bit. Strawpoll whether to remove one bit:*
- 6.2.4.37. *SriniK: The vote is : 2:13:3. So we can call this resolution declined. Will add "The extra bit helps in reducing the implementation complexity."*
- 6.2.4.38. *JohnF: Again, are there any suggested edits to this resolution? Are there any objections to accept the resolution as shown? I see some objections, so I would like to see a formal motion and second.*
- 6.2.4.39. *Moved to accept this resolution: SriniK/JohnK.*
- 6.2.4.40. *KeithA: Someone really needs to justify the reduction in the complexity to justify this extra bit. This is going to be further into the frames, so you have to receive a lot more of the frame to determine. Makes the state machine much more complicated.*
- 6.2.4.41. *GregC: You're not going to Ack until you see the FCS.*
- 6.2.4.42. *KeithA: I just think the second bit is not worthwhile.*
- 6.2.4.43. *SidS: I think you would need to keep a record of the field for much longer without the two bits.*
- 6.2.4.44. *SriniK: There is a no-Ack bit in the frame control still.*
- 6.2.4.45. *JimL: The problem here is to distinguish between no-Ack and group Ack. Searching through all the fields is just unacceptable to me.*
- 6.2.4.46. *CharlesW: If only have one bit, then how know which it is?*
- 6.2.4.47. *SriniK: The idea is you would determine that from the context.*
- 6.2.4.48. *GregC: It is. Call the question.*
- 6.2.4.49. *JohnF: Is there a second to call the question – I see JohnK. Is there any objection to calling the question? I see no objection, so the question is called. Srini, please reread the motion.*
- 6.2.4.50. *SriniK: {reviewed the text} The proposed resolution is [that given for] comment 290.*
- 6.2.4.51. *JohnF: Vote is technical: Passes 25:0:6.*
- 6.2.4.52. *JohnF: It seems, however, that it doesn't make much sense to have motions to decline something. If this motion had failed, then what would we be doing? If we vote to do nothing, then we are rejecting the comment. So please make future motions to accept a resolution or to accept a modification of a resolution.*
- 6.2.4.53. *SriniK: Next comment [166] is about 7.1.3.5., Table 3.1. Proposal is to collapse the last two rows into one, and to make that row about all QoS data frames. Comment 288 is a slight variant of this, but requested the opposite to what 166 requested. Comments 426, 426 are other variations of the same.*
- 6.2.4.54. *GregC: I wonder why this was allowed to get contentious. People would like the way of expressing state to be uniform. If there's state and you have to look that up for each packet, you have a problem. I'd much rather have packets self describing, and all packets being equally descriptive. Simplest way to fix it is to have the same encoding – you don't break anything that already exists, you don't lose any functionality, and you don't have to carry state. You should accept the proposed solution in Comment 426.*
- 6.2.4.55. *AmjadS: You could use the last row.*
- 6.2.4.56. *KeithA: Greg's solution is the same as the first comment in this group.*
- 6.2.4.57. *SriniK: I propose to accept comment 166, since that's the simplest solution.*
- 6.2.4.58. *JohnF: Are there any comments about accepting the resolution to comment 166, "Comment accepted."? Hearing none, again, are there any objections to this resolution? Are there any objections to accept the resolution as shown? Seeing no objections, this resolution has passed.*

- 6.2.4.59. *SriniK: Comment 253(?): we accepted the comment, but declined the recommended change.*
- 6.2.4.60. *GregC: Would like to table this until after the TSPEC discussion.*
- 6.2.4.61. *SriniK: I agree. That's it for now.*

6.2.5. Block Ack group red-marked comments

- 6.2.5.1. *SidS: The four comments are four separate subjects. Two will need presentations. Comment 50, to make Block Ack available to stations independent of rest of QoS facility, so that get performance improvements. Carlos's presentation is 03/058r2.*
- 6.2.5.2. *GregC: Does his paper provide a method of negotiation without using TSPECs? This might be related to the TSPEC discussion. It would be easy to accept his proposal if it doesn't involve TSPECS.*
- 6.2.5.3. *SidS: I think you're getting into what the group feels should be done in general. I think Carlos proposed using legacy frame formats.*
- 6.2.5.4. *GregC: The problem there is that a lot of work has gone into fixing bugs with that. I believe Carlos would probably agree with our proposed resolution. Since we're being asked for a statement of direction to the ad-hoc group, Carlos doesn't have to be here.*
- 6.2.5.5. *SidS: I agree that we only need a straw poll on the direction now.*
- 6.2.5.6. *JohnF: Can you give a two minute overview?*
- 6.2.5.7. *CarlosR: I have 6-7 slides.*
- 6.2.5.8. *JohnF: Don't have time for that, just an overview.*
- 6.2.5.9. *Carlos: Believe that we can separate GroupAck from QoS.*
- 6.2.5.10. *JohnF: Suggest we just get a raincheck on this one. Sid, have a short topic?*
- 6.2.5.11. *SidS: Comment 342 on line 1668, on Clause 9.11.2, 10.3.16: Srini has a presentation on this, to allow for the receiver to set the GA.*

6.3. Recess

- 6.3.1.1. *JohnF: There's no time for that; so we now need to recess for the break.*
- 6.3.1.2. *JohnF recessed the meeting at 2:58pm.*

6.4. Opening

6.4.1. Call to Order

- 6.4.1.1. *JohnF: Called the meeting back to order at 3:35pm.*
- 6.4.1.2. *JohnF: Since Carlos is ready to present, we'll start with Carlos's presentation*

6.4.2. Document 11-03-051r3, Proposed Modifications to 802.11e-D4.2 Block Ack, Carlos Rios

- 6.4.2.1. *CarlosR: Essentially the proposal is unbundle Block Ack from QoS. This includes reclassify the ADDBA/DELBA as a new category and adjusting SIFS.*
- 6.4.2.2. *CarlosR: So I'd like to make the motion:*
- 6.4.2.3. *CharlesW: Do you need to add a no-Ack bit in the capabilities field?*
- 6.4.2.4. *CarlosR: That bit is already there.*
- 6.4.2.5. *SidS: We need to have the complete text including the PICS, since we need to see all of the details. Need that before we can vote this in.*
- 6.4.2.6. *SidS: Next question is how this can be marketed?*
- 6.4.2.7. *CarlosR: Basically beyond this group.*

- 6.4.2.8. SidS: *Understand the rationale, but have an issue – can't be TGe.*
- 6.4.2.9. CarlosR: *clearly wouldn't do the sleazy marketing of implementing only a small part of TGe and making that kind of claim.*
- 6.4.2.10. SidS: *If either of two alternatives, then may find it difficult*
- 6.4.2.11. JohnK: *I believe this is out of scope of this group.*
- 6.4.2.12. CarlosR: *But these are components that came from this group.*
- 6.4.2.13. JohnK: *It is outside of this group because it provides no QoS.*
- 6.4.2.14. SidS: *I agree with that.*
- 6.4.2.15. ??1: *But how do you do this in QoS?*
- 6.4.2.16. CarlosR: *My goal is to cleave this from QoS.*
- 6.4.2.17. JimL: *Are you saying that you'll have that one Ack bit in the frame control and another in the QoS field?*
- 6.4.2.18. CarlosR: *I wouldn't even transmit the QoS frame, so that wouldn't be there.*
- 6.4.2.19. JimL: *You're going to have to introduce new MLME interfaces.*
- 6.4.2.20. CarlosR: *I thought the current was adequate, but would like suggestions.*
- 6.4.2.21. JimL: *Right now there is one counter for everything, but there can be a lot of gap between frames within a burst Ack.*
- 6.4.2.22. CarlosR: *I believe there is enough buffer now there.*
- 6.4.2.23. SidS: *The group Ack becomes very inefficient when there are major separations.*
- 6.4.2.24. CarlosR: *Then the implementer can just do tradeoffs between these facilities.*
- 6.4.2.25. Bill?: *When put this into an otherwise legacy device you end up with a legacy device that can do 100 msec burst Acks.*
- 6.4.2.26. CarlosR: *That's what I want.*
- 6.4.2.27. Bill?: *That's just what we don't want to allow.*
- 6.4.2.28. MatthewS: *I believe you've implemented so much of QoS that this should not be separable.*
- 6.4.2.29. Simon Chung (SimonC): *How do higher layers indicate this to the MAC?*
- 6.4.2.30. CarlosR: *That is implementation dependent.*
- 6.4.2.31. GregC: *Would you be willing to accept a TSPEC negotiation first?*
- 6.4.2.32. CarlosR: *If I would be willing to do that, the whole QoS would be acceptable.*
- 6.4.2.33. JohnK: *Strawpoll: Who would in be in favor of this possible motion, assuming it is in order?*
- 6.4.2.34. JohnF: *Strawpoll vote is: 1:26:6, so based on that, do you want to move?*
- 6.4.2.35. CarlosR: *I think that indicates the group's direction.*
- 6.4.2.36. SidS: *So I'd like to make a motion to decline the comment.*
- 6.4.2.37. MatthewS: *This should include bursting, not just Group Ack.*
- 6.4.2.38. SidS: *I move to direct the ad-hoc group to decline comment 1640 and craft the appropriate text.*
- 6.4.2.39. JohnF: *Since we don't have the exact wording, I would just like to ask for a consensus. Is there any objection to directing the ad hoc group to do that? I hear no objection.*
- 6.4.2.40. Duncank: *On Monday we agreed that this would be the procedure.*
- 6.4.2.41. SidS: *Next comment, Comment 344, is by Srimi.*
- 6.4.2.42. SrimiK: *Originally we put in this functionality to support FEC; now that FEC is gone, we don't need this anymore.*

- 6.4.2.43. SidS: *Your proposal is to eliminate case two. Part of the issue is whether this has other uses. I don't have a strong opinion on this.*
- 6.4.2.44. SрниK: *My original thought was just to eliminate hardware.*
- 6.4.2.45. SidS: *Strawpoll: who would favor leaving the draft as is; or accepting the comment (delaying response); or abstain?*
- 6.4.2.46. JohnF: *0:16:18. Since there are so many abstains, are there any objections to telling this group to craft that text?*
- 6.4.2.47. MatthewS: *How do you respond to that frame?*
- 6.4.2.48. SidS: *You always respond with a block Ack. You either always respond immediately or you never respond immediately.*
- 6.4.2.49. SрниK: *Look at figure 62.5.*
- 6.4.2.50. AliR: *This allows more time.*
- 6.4.2.51. SidS: *Agree; this allows an implementation a little more time to get it again. You eliminate the end of the sentence that ends on line 30 of page 87 of Draft 4.0.*
- 6.4.2.52. JohnF: *Is there any objection to asking the ad hoc group to draft text?*
- 6.4.2.53. AliR: *I object.*
- 6.4.2.54. JohnF: *There is one objection so, I will put it to a vote.*
- 6.4.2.55. SрниK: *I speak against my comment.*
- 6.4.2.56. JohnF: *Everybody who is in favor to directing the ad hoc group to craft text? Vote: 13:3:22. Given that, you have the direction to write the text.*
- 6.4.2.57. SidS: *Now we can say "comment accepted".*
- 6.4.2.58. JohnF: *Is there any objection to accepting this resolution?*
- 6.4.2.59. MatthewS: *What is the possible use of this?*
- 6.4.2.60. AliR: *The net gain in efficiency is very small.*
- 6.4.2.61. CharlesW: *Why not just use a delayed block Ack?*
- 6.4.2.62. SidS: *That's very inefficient – you take up a channel.*
- 6.4.2.63. JimL: *The more I think about it, the more I'm against it. If target can't assemble quick enough, so can't send back group Ack until it wins contention again; that just defeats the purpose of the group Ack.*
- 6.4.2.64. AliR: *This allows for various implementations – when to respond with a delayed Ack.*
- 6.4.2.65. JohnF: *Any more discussion? I hear no more discussion, so everybody who is in favor of this resolution, raise your voting token. The vote (technical) passes: 21:5:9.*

6.4.3. Comment 346, single MIB value on error detection

- 6.4.3.1. SidS: *There is a single value that applies to very block Ack session; it should depend on the application. So it should be part of the negotiation. It adds complexity, but it is a refinement that may be useful to some.*
- 6.4.3.2. JohnF: *Any discussion?*
- 6.4.3.3. MatthewS: *Where is this MIB variable?*
- 6.4.3.4. SрниK: *It is in 9.11.*
- 6.4.3.5. SidS: *The only place [it occurs].*
- 6.4.3.6. MatthewS: *I think it should be generic, just not apply it here.*
- 6.4.3.7. SрниK: *I would be willing to [write the description].*
- 6.4.3.8. MatthewS: *I need to write some text.*
- 6.4.3.9. CharlesW: *You need to tell us what you intend, or else just decline the MIB variable.*
- 6.4.3.10. SрниK: *There were several uses of this variable, but the others have gone away.*
- 6.4.3.11. JohnF: *Does anyone want to give the ad hoc group specific direction?*

- 6.4.3.12. SidS: Straw poll: Who is in favor of accepting the comment? Declining the comment? Abstain?
- 6.4.3.13. JohnF: The strawpoll vote is 12:0:21; so we have a clear direction.
- 6.4.3.14. MatthewS: I withdraw the offer to amend.
- 6.4.3.15. JohnF: Is there any objection to directing the ad hoc group to accept this comment? I see no objection, so they are so directed by the group.
- 6.4.3.16. JohnF: Are there any other groups ready to report?
- 6.4.3.17. JohnK: Have reviewed 9.2.10.4.2 and Annex A, and have a presentation.
- 6.4.3.18. JohnF: Duncan has been assigned some comments, and Keith has others, but where are all of the other comments going?
- 6.4.3.19. Srinik: Frame formats has 300 comments to go.

6.4.4. Clause 9.2.10.4.2 and Annex A

- 6.4.4.1. JohnK: Presented document 03/227r1. See the related comments in 11-03-238r0-E-910242_Annex_A_and_General_Comments.xls: comments 80, 111, 132, 378, 417, 563, 885, 886, 1059, 1063, 130, 113, 236 and 443.
- 6.4.4.2. JohnF: Any questions?
- 6.4.4.3. MatthewS: Request that a vote be put off until tomorrow morning for review.
- 6.4.4.4. JohnK: Strawpoll: Yes, No, or Abstain to declining these comments, because they affect the current tradeoffs on status of HCF and EDCF.
- 6.4.4.5. JohnF: The strawpoll vote is 30:5:6. Matthew has requested this.
- 6.4.4.6. GregC: The strawpoll indicates it's not controversial anymore.
- 6.4.4.7. MatthewS: I'm just asking for one more day to review and perhaps to make a proposal.
- 6.4.4.8. JohnF: I suggest that the group gives the time requested by Matthew and consider this tomorrow.
- 6.4.4.9. DuncanK: We've been talking about this for three years, and another day doesn't help. You can always move to table the motion.
- 6.4.4.10. JohnK: Move to accept as a resolution declining comments the following text: This comment is declined.
- 6.4.4.11. DuncanK: Second.
- 6.4.4.12. MatthewS: Move to postpone until 10:30am tomorrow.
- 6.4.4.13. Bob Miller: Second.
- 6.4.4.14. JohnF: Motion to postpone is not debatable.
- 6.4.4.15. JohnF: Vote: 10:25:11. Fails.
- 6.4.4.16. John Fuller: Call the question.
- 6.4.4.17. Srinik: Second.
- 6.4.4.18. JohnF: Is there any objection to calling the question? Hearing none, the question is called. Vote (technical): 30:8:4 Passes.
- 6.4.4.19. JohnF: I still want to assure that about 700 other comments are still not accounted for.
- 6.4.4.20. Srinik: The frames group has started; it has 500 comments, and has covered 100 of them.
- 6.4.4.21. JohnK: Have 50 for general, of which 15 were just resolved.
- 6.4.4.22. Srinik: Keith has about 150; JohnK also has 9.10.2.4.2, which has another 150 comments.
- 6.4.4.23. DuncanK: 9.1 and 9.10.1 have about 150 comments.
- 6.4.4.24. JohnF: We need a strategy for how to go on about all those comments.

6.4.5. Discussion of motion to reconsider

- 6.4.5.1. *MatthewS: Point of Order. Before I asked if the motion to table is debatable, and you said no. But I just checked Robert's Rules and it is debatable.*
- 6.4.5.2. *JohnF: Does it require 2/3 or is it 50 percent?*
- 6.4.5.3. *Harry Worstell: It shows 2/3.*
- 6.4.5.4. *JohnF: That makes it equivalent to a motion to reconsider. Matthew, is that an acceptable alternative?*
- 6.4.5.5. *John Fuller: Is that motion to reconsider debatable?*
- 6.4.5.6. *JohnF: Yes.*
- 6.4.5.7. *MatthewS: Is the motion to reconsider in order tomorrow?*
- 6.4.5.8. *JohnF: I will allow that.*
- 6.4.5.9. *DuncanK: There is a set process for breaches in procedure. It should be followed.*
- 6.4.5.10. *JohnF: I choose not to go there; if there is a motion to reconsider tomorrow, I will consider it in order.*
- 6.4.5.11. *JohnK: But to do that tomorrow, it will be the time that is being requested anyway.*
- 6.4.5.12. *SriniK: I was on the winning side, so I move to reconsider.*
- 6.4.5.13. *MatthewS: Second.*
- 6.4.5.14. *JohnF: Matthew, I will give you the chance to present on this [issue].*
- 6.4.5.15. *MatthewS: This topic came up randomly on the agenda, so there was little time to check now. The material was not in to-doc-keeper, but in a working folder, so was hard to find; I would like to make a presentation on this – would like this to be an agenda item so that I could make a 10 minute presentation.*
- 6.4.5.16. *JohnF: Someone to speak against reconsideration?*
- 6.4.5.17. *JohnK: I speak against. Have had three years to review, 83% approval, and 90-some percent were all right with the current text here. We knew that this topic would be coming up during these meetings. The people in the room are tired about arguing about this.*
- 6.4.5.18. *Bob Miller: I realize this is contentious; I believe the vote was taken in haste; the overall voters are not necessarily represented in this room. I believe this is cutting off a branch of the tree, so we need to do it with a little more dignity to do something with such broad consequences.*
- 6.4.5.19. *JohnF: I believe we still need to bring the actual comments back.*
- 6.4.5.20. *John Fuller: That's not what is on the screen.*
- 6.4.5.21. *JohnF: I stand corrected then.*
- 6.4.5.22. *DuncanK: I speak against this motion. The overwhelming majority are in favor.*
- 6.4.5.23. *GregC: Call the question.*
- 6.4.5.24. *{Secretary missed who seconded.}*
- 6.4.5.25. *JohnF: Is there any objection to call the question? I see two, so we will vote. In favor of calling the question (2/3 vote): 24 :7:11 Passes, so the question is called.*
- 6.4.5.26. *JohnF: All in favor of the motion to reconsider? Vote (2/3): 8:27:11, so fails.*
- 6.4.5.27. *SriniK: One clarification: my group has slightly less than 750 comments, not 500.*
- 6.4.5.28. *JohnF: How can the general group help the ad-hoc groups?*
- 6.4.5.29. *SriniK: Can we schedule a meeting now?*
- 6.4.5.30. *JohnF: No more time is scheduled today.*
- 6.4.5.31. *JohnK: When can we meet?*

6.5. Recess

- 6.5.1.1. *JohnF: Are there any more comments? Hearing none, the meeting is recessed.*
- 6.5.1.2. *JohnF recessed the meeting at 5:22pm*

7. Thursday Morning, March 13, 2003

7.1. Opening

7.1.1. Call to Order

- 7.1.1.1. *JohnF called the meeting to order at 8:07am.*

7.2. Presentation of Papers

7.2.1. Discussion of papers to be presented

- 7.2.1.1. *JohnF: I have heard requests for more papers to be presented.*
- 7.2.1.2. *MarkB: Will present a paper on Roaming when that topic comes up.*
- 7.2.1.3. *JohnF: Let's do that paper now. Do you have your paper ready?*
- 7.2.1.4. *MarkB: The text only went on the server last night, so we can't make a motion yet.*
- 7.2.1.5. *JohnK: I have a paper ready on AV uses of 802.11e, but have no associated motion.*
- 7.2.1.6. *RichardL: I have a paper on QAP, but with no motion*
- 7.2.1.7. *JohnF: Informative only?*
- 7.2.1.8. *RichardL: Yes.*
- 7.2.1.9. *JohnF: In the meantime I'd like the group leaders to be ready with reports; then we'll probably recess for ad-hoc group works. We really need to get working on those; the current rate is unacceptable. I've calculated that at this rate it will take a year and a half. There have been some informal reports on ad-hoc progress. Also we may [hold an Ad-Hoc meeting].*

7.2.2. Document 802.11-03/196r1, Roaming Improvements, Mark Bilstad

- 7.2.2.1. *MarkB: this is a follow-up to the previous version of this paper. This proposal is related to comments 860, 861, 862, 863, plus is an alternate resolution to several other comments. [See list at beginning of the paper.]*
- 7.2.2.2. *MarkB: defining a new "QoS Management Action Header", allowing a "transport" alternative.*
- 7.2.2.3. *MatthewS: So you're encapsulating within a TSPEC?*
- 7.2.2.4. *MarkB: No.*
- 7.2.2.5. *MatthewS: Did you add the bidirectional field to the TSPEC?*
- 7.2.2.6. *MarkB: Yes. But there is no change to the structure of the information elements; basically adding a new one.*
- 7.2.2.7. *MatthewS: Is there anything new in the management information header?*
- 7.2.2.8. *MarkB: Nothing. I'd like to get rid of action frames, but that might be a problem later for .11h.*
- 7.2.2.9. *JimL: How many TSPECs are in the association?*
- 7.2.2.10. *MarkB: In the case of a phone call the direction allow you to collapse into a single TSPEC, then that can be embedded in the association request. You can, in that case, have multiple associations on one request. But the action frames are unchanged.*
- 7.2.2.11. *???: Can there be multiple elements, and a schedule element?*

- 7.2.2.12. MarkB: Yes.
- 7.2.2.13. Isaac: *With bidirectional field, how many responses?*
- 7.2.2.14. MarkB: *Just one response.*
- 7.2.2.15. JohnK: *If there is a different schedule in each direction? Does this [matter]?*
- 7.2.2.16. BobM: *There is only one schedule for everything.*
- 7.2.2.17. JohnK: *The way we have it done right now is that the TSPEC is associated only with the initiator.*
- 7.2.2.18. BobM: *There's only one schedule.*
- 7.2.2.19. JohnK: *In the downlink direction you're not sending a poll, but need one in uplink. How do know that that schedule is sufficient.*
- 7.2.2.20. BobM: *The schedule is just a schedule. But better question is what do you do if you want to reject one while accept the other.*
- 7.2.2.21. MarkB: *Should be explicitly stated that the AP should be allowed to split the response to the TSPECS, one up and one down.*
- 7.2.2.22. Srinik: *The good thing is that can attach the action.*
- 7.2.2.23. MarkB: *That's true; I don't see any disruption to what security might need.*
- 7.2.2.24. MarkB: *The text is in 11-03-196r1-E-Roaming-Improvements-Norm-Text.doc. The idea was to make it find the same format as the TSPEC.*
- 7.2.2.25. JohnK: *You wouldn't mind if we changed the TSPEC granularity – if we made it less granular?*
- 7.2.2.26. MarkB: *Not at all.*
- 7.2.2.27. MatthewS: *What about if used time format; it's different from available time? Since you have time format, why not keep that?*
- 7.2.2.28. JohnK: *What's the meaning of this?*
- 7.2.2.29. MarkB: *The meaning is that you're trying to advertise the clients for admission.*
- 7.2.2.30. JohnK: *In a time slice there is a station-station link that is between those; it's not meaningful for the whole BSS.*
- 7.2.2.31. MarkB: *Trying to give a client indication of what's available.*
- 7.2.2.32. MatthewS: *Say have 2 Mbits available while running at 11 Mbits, but can only run at 11 mbits, then can have false advertising. If I'm a factor of two off in the capacity, then I'm not close to the actual.*
- 7.2.2.33. MarkB: *This is just an approximation process.*
- 7.2.2.34. JohnK: *Time works better here.*
- 7.2.2.35. CharlesW: *But isn't that equivalent to the available in the time available in the AP?*
- 7.2.2.36. MatthewS: *You should advertise time available.*
- 7.2.2.37. CharlesW: *I'm agreeing.*
- 7.2.2.38. Srinik: *You have a problem still with time. You know there's an amount of time, but don't know which direction. It's dynamic, so you'll always have this time.*
- 7.2.2.39. JohnK: *It's isotropic.*
- 7.2.2.40. MatthewS: *That's why you always want to reserve additional bandwidth.*
- 7.2.2.41. JohnK: *The admissions space is always both rate and time dependent.*
- 7.2.2.42. MarkB: *The point of this is it's a guess; you need TSPECs.*
- 7.2.2.43. CharlesW: *No matter what anyone does you're always going to have this problem with roaming.*
- 7.2.2.44. MarkB: *This will always be an approximation; the goal is to give as good an approximation as you can.*
- 7.2.2.45. MatthewS: *I'd call this "max admitted utilization".*
- 7.2.2.46. MarkB: *I'll follow up with you on that.*

- 7.2.2.47. *JavierP: How do you know all the parameters apriori? You might know uplink but not downlink parameters beforehand.*
- 7.2.2.48. *MarkB: This is just collapsing the two TSPECs into one.*
- 7.2.2.49. *MarkB: This proposal also includes the editorial change to replace "ADDTs action frame" into "ADDTs action request / response".*
- 7.2.2.50. *MarkB: If you have any objections to this, please come to talk to me.*

7.2.3. Document 11-02/427/r2A, Recommended Practice for use of 802.11e for Broadcast AV Transmission, John Kowalski

- 7.2.3.1. *JohnK: This [paper] is put together by representatives of the AV companies, who need interoperability very strongly. But is not clear that applications for AV will use a DS. May have a QAP/HC that is external to the settop box, TV, etc., and that QAP/HC may or may not be connected to a DS. Do expect to use HCF, but not PCF, also Block Ack, DLP.*
- 7.2.3.2. *MatthewS: I'm on a truth in advertising campaign: really should say "polled access" instead of "HCF".*
- 7.2.3.3. *JohnK: That's precisely what we mean.*
- 7.2.3.4. *KeithA: I don't mean to be rude, but does this apply to comments?*
- 7.2.3.5. *MatthewS: I believe it will indicate the needs of AV manufacturers for certain features.*
- 7.2.3.6. *JohnK: Agree.*
- 7.2.3.7. *KeithA: What about power save?*
- 7.2.3.8. *JohnK: It's not vital to this set of uses; what we're talking about here is things that plug into walls.*
- 7.2.3.9. *CharlesW: Would you call these AV parameters?*
- 7.2.3.10. *JohnK: These are the broadcast parameters.*
- 7.2.3.11. *JohnK: We especially seek feedback on the MIB parameters [listed in this document].*

7.2.4. Document 11-03/206r0, A Separate QAP EDCF Parameter Set, Richard van Leeuwen

- 7.2.4.1. *RichardL: After saturation, in the simulation the upstream still gets time, at the cost of the downstream.*
- 7.2.4.2. *SriniK: I think this needs to be done. Is there a comment associated with this?*
- 7.2.4.3. *RichardL: Several are related to this.*
- 7.2.4.4. *BobM: My question is about bounds: is this bounded?*
- 7.2.4.5. *RichardL: You could use the HC parameters, but this implies that you have to do the scheduling in the AP.*
- 7.2.4.6. *BobM: You might starve the others; what about using admission control?*
- 7.2.4.7. *RichardL: You certainly could use admission control.*
- 7.2.4.8. *KeithA: How many nodes?*
- 7.2.4.9. *RichardL: 50.*
- 7.2.4.10. *KeithA: Did you ever try running these with hidden node scenario?*
- 7.2.4.11. *RichardL: No.*
- 7.2.4.12. *JimL: Why do you need this when the AP can do scheduling*
- 7.2.4.13. *RichardL: You still have four access categories, even in the AP. The reason is to have this when you don't have an AP that does scheduling.*
- 7.2.4.14. *Thomas Kuehnel (Thomask): You're using four different ACs?*
- 7.2.4.15. *RichardL: Yes.*

- 7.2.4.16. CharlesW: There were comments about whether they were separated.
- 7.2.4.17. RichardL: There were comments about having four.
- 7.2.4.18. CharlesW: So this is assuming that admission control already is done?
- 7.2.4.19. RichardL: Yes.
- 7.2.4.20. SрниK: In Fort Lauderdale this was implied by some of the comment solutions, but never really brought out.
- 7.2.4.21. JavierP: Didn't we already have 4 ACs?
- 7.2.4.22. RichardL: Strawpoll: everybody in favor of this proposal?
- 7.2.4.23. JohnF: The results are 20:3:10.

7.2.5. Discussion about an ad-hoc interim meeting

- 7.2.5.1. JohnF: Keith has offered a location for another Ad-Hoc meeting. But first, [I'd like to ask whether there are any other offers].
- 7.2.5.2. AmjadS: We can also host a meeting.
- 7.2.5.3. JohnK: It makes sense to have at least one [alternative].
- 7.2.5.4. SрниK: We do about 10 comments per hour and have 750 comments left, so we need at least 60-70 hours.
- 7.2.5.5. JavierP: What about teleconference?
- 7.2.5.6. JohnF: That is a possibility, though in the past teleconferences haven't been very effective.
- 7.2.5.7. SidS: We have to take into account what the attendance will be if we have two conferences.
- 7.2.5.8. MatthewS: At the ad-hoc we really need to run only one track at a teleconference.
- 7.2.5.9. JohnF: So we have three alternatives here.
- 7.2.5.10. BobM: If we have a teleconference, we need to send all drafts to the reflector before the meeting.
- 7.2.5.11. JohnF: That is always a good idea for people who have [the chance to read them beforehand].
- 7.2.5.12. JohnF: Poll: by the end of April, how many people will show up if we have at least one Ad-Hoc meeting? How many people will participate in two if we have two Ad-Hoc meetings? And how many people will participate in a teleconference? You may vote for more than one.
- 7.2.5.13. JohnF: The results are: 12:2:20. Based on that, I suggest one ad-hoc and some teleconferences in between. Any objections to that suggestion? Hearing none, I propose something in the week of April 21st.
- 7.2.5.14. KeithA: That also meets the 30 day requirement.
- 7.2.5.15. JohnF: Are there any objections to those times? Hearing no objections, are there any other candidates? Hearing none, I'd like presentations from the two candidates.
- 7.2.5.16. KeithA: We have two possible locations near the Boulder area, both with high speed connections; one has more restaurants. It is 30 miles from the airport.
- 7.2.5.17. JohnF: Do you have wireless?
- 7.2.5.18. KeithA: That will be worked out.
- 7.2.5.19. AmjadS: New York is the most convenient location in the world. Have at least 4 airports. Briarcliff Manor is 35 miles north of the city; takes about 40 minutes on the train from New York. Can provide wireless internet connections.
- 7.2.5.20. JohnK: Suggest that we have another ad-hoc after the Singapore and that be the [other of the two offers].
- 7.2.5.21. JohnF: Strawpoll, vote for one, everyone may vote: Colorado by everyone, then Colorado by expected participants; New York by everyone; then New York by expected participants.

- 7.2.5.22. JohnF: The vote is: 8:6:10:9. Is there any objection to New York? I hear none, so New York it is. How about setting up the meeting times now?
- 7.2.5.23. SriniK: Most of us will be coming from the West Coast, so will have to come in the previous day anyway, so would like to start earlier anyway.
- 7.2.5.24. JohnF: I'll go with the group's direction, but how about starting with 2pm?
- 7.2.5.25. SidS: I believe that the meeting should start earlier.
- 7.2.5.26. KeithA: I can fly in in the morning.
- 7.2.5.27. SidS: OK.
- 7.2.5.28. JohnF: So no objection to 2pm Monday. What flights can be caught on the way out?
- 7.2.5.29. JohnK: Should allow 1-1/2 hours.
- 7.2.5.30. JohnF: Ok, so end at 4pm on Thursday, and work 9am-9:30pm the other days.
- 7.2.5.31. JohnF: Teleconferences. Do we want weekly, bi-weekly?
- 7.2.5.32. JohnK: I'm not of the opinion that teleconferences are of much use; how about having only one?
- 7.2.5.33. SriniK: I speak against what John said. My suggestion is to have two every week.
- 7.2.5.34. MatthewS: I would advocate one per week; last time I had two, I got burned out.
- 7.2.5.35. CharlesW: How long will these be?
- 7.2.5.36. JohnF: Typically about 2-1/2 hours.
- 7.2.5.37. KeithA: If we're going to do teleconferences, I'd like to see a show of hands of people who will actually be on the calls.
- 7.2.5.38. JohnF: I agree, but need to decide first how many we're going to have. If you raise your hand, you promise participate.
- 7.2.5.39. JohnF: Strawpoll: participate in 2 per week; participate in only one teleconference, total; participate in 1 per week. The results are 4:2:11. So are there any objections to one per week? Hearing no objections, then how about 2-1/2 hours? Any objections? Hearing no objections, what time slots? Suggestions for times: 12pm EST, 6pm EST, and to alternate between the times to be fair to different areas of the world. Results are: 12 : 5: 3. So are there any objections to set the time to 12pm. What day of the week?
- 7.2.5.40. JohnK: Wednesday.
- 7.2.5.41. JohnF: Are there any objections to Wednesday?
- 7.2.5.42. ???: RRM has their teleconferences on Wednesday, but 8-9 PST.
- 7.2.5.43. MatthewS: Begin what week?
- 7.2.5.44. JohnF: Could begin in 30 days, but that's the week of the ad-hoc.
- 7.2.5.45. CharlesW: TGk started in less than 30 days.
- 7.2.5.46. JohnF: If no one objects you can do that, but otherwise have to follow the rules.
- 7.2.5.47. MatthewS: 30 days is only the 16th.
- 7.2.5.48. JohnF: So what about having the 16th, 30th, and another one in May?
- 7.2.5.49. SriniK: In the past we've had teleconferences within 10 days; and we need as many hours as we can.
- 7.2.5.50. MatthewS: And there's only one possible slot in May, so we could only squeeze in additional ones earlier.
- 7.2.5.51. JohnF: When would you want to start?
- 7.2.5.52. SriniK: On March 26th.
- 7.2.5.53. JohnK: In order to avoid 30-day procedures, why not schedule these after Singapore, until we go to recirculation?
- 7.2.5.54. JohnF: Vote for one: first one on 16th April and continue until recirculation; first one on 26th March and continuing until recirculation?

- 7.2.5.55. *JohnF: The vote is 0:11. Is there any objection to starting on the 26th and continue until recirculation?*
- 7.2.5.56. *CharlesW: Following what TGk said, how about just saying that we'll have teleconferences until we cancel them? So then wouldn't have to reschedule later.*
- 7.2.5.57. *JohnF: With all due respect, we already aren't obeying the 30-day rule, so would rather not push too far.*
- 7.2.5.58. *SriniK: My daughter's birthday is on April 23^d, so would like to request that the [Interim] Ad-Hoc meet one week earlier or later, which would still be 30 days after this session.*
- 7.2.5.59. *JohnF: Completing the teleconferences [issue] first: one per week starting on 16th March, on Wednesdays, and continuing until the recirculation ballot starts. Last call: any objections? Hearing none, then that is the decision.*
- 7.2.5.60. *JohnF: Now on moving the Ad-Hoc meeting. Any objections to moving it? I see two objections, so we'll vote.*
- 7.2.5.61. *JavierP: The Philips Lab can't support the 14th of April.*
- 7.2.5.62. *JohnF: The options are to [meet] the 21st-25th of April; or the 28th April-1st of May. The vote is 6:8, so will change the dates to April 28th – 1st of May. Are there any objections to these dates? Hearing none, that is the schedule.*

7.3. Recess

- 7.3.1.1. *JohnF recessed the meeting for the break at 10:00am*

7.4. Opening

7.4.1. Call to Order

- 7.4.1.1. *JohnF called the meeting to order at 10:40am.*

7.4.2. Teleconference discussion

- 7.4.2.1. *JohnF: We need a coordinator for the teleconferences. Are there any volunteers?*
- 7.4.2.2. *SriniK: I have a number and administrative work done, so will volunteer.*
- 7.4.2.3. *JohnF: Then, if there are no objections, Srini will be the leader for those teleconferences.*

7.4.3. Agenda: ad-hoc comment resolutions group work

- 7.4.3.1. *JohnF: I have the section leaders as Keith, JohnK, Duncan, Sid and Srini.*
- 7.4.3.2. *KeithA: Will be working on Power Save, clause 11, and on MIB. We do have an overlap with Srini's group. But will first defer for half an hour, because I have a presentation in another group.*
- 7.4.3.3. *JohnF: Sid is done.*
- 7.4.3.4. *SriniK: We will be working on about 700 comments in the Clause 7 group.*
- 7.4.3.5. *DuncanK: I'm not ready to do the rest of the red marked comments, but there is nothing more for the ad hoc group to do – including clause 9.1.*
- 7.4.3.6. *JohnK: Our group will meet now about Annex X, 9.10.2.4.2 and General comments, and we need a lot of support, especially with wordsmithing.*
- 7.4.3.7. *JohnF: So the three active groups are KeithA, JohnF, and SriniK. Status will be needed at 7pm.*

7.4.4. Recess

- 7.4.4.1. *JohnF recessed the meeting at 10:48am for ad-hoc group work until 7pm.*

8. Thursday Evening, March 13, 2003

8.1. Opening

8.1.1. Call to order

8.1.1.1. *JohnF called the meeting to order at 7:07pm.*

8.1.2. Agenda review

8.1.2.1. *JohnF: We have special orders to entertain motions related to putting out a new draft.*

8.1.2.2. *MarkB: I want to make a motion related to my earlier paper.*

8.1.2.3. *JohnF: Since that was previously scheduled, we don't need a new item for that. Do we have any other papers or motions that need to be taken up in this meeting? Hearing none, then we need to review the accomplishments of the ad-hoc groups. The order I have for reporting is Keith, JohnK, Srini and then Sid.*

8.2. Ad hoc group reports

8.2.1. Power save (clause 11.2 and Annex D) ad-hoc comment resolution group

8.2.1.1. *Document 11-03-247r1-E-LB51_Comment_Resolution_Clause_112_and_Annex_D.xls*

8.2.1.2. *KeithA: There are about 50 related comments, 22 of which have been resolved by the group, and three need to be brought to the TG as a whole. [Starting with the comments marked in green in that document.]*

8.2.1.3. *KeithA: At Fort Lauderdale the group reworked the text about the "more data" bit to resolve a number of related comments. [Comments 107, 1018, 1038.]*

8.2.1.4. *JavierP: I believe that the frame format group had a different resolution.*

8.2.1.5. *KeithA: Did you have a resolution to keep it, or to do nothing with it?*

8.2.1.6. *SriniK: Basically to do nothing with it.*

8.2.1.7. *KeithA: Strawpoll: What is the feeling about the "schedule pending" bit?*

8.2.1.8. *BobM: We couldn't come up with a purpose beyond keeping the station awake listening for it.*

8.2.1.9. *JavierP: "More Data" is only used for power save mode, so it could be used by the AP to tell a station to stay awake pending a schedule.*

8.2.1.10. *BobM: The only way for a station to transition to power save.*

8.2.1.11. *KeithA: The consensus we came to is to remove it. Strawpoll in favor of removing the schedule pending bit; those opposed? [And those] abstain[ing].*

8.2.1.12. *JohnF: I count 12:4:7.*

8.2.1.13. *KeithA: So I would tend to remove the bit.*

8.2.1.14. *AmjadS: The group as a whole has not had a chance to discuss. I would like to get an opportunity to discuss this.*

8.2.1.15. *KeithA: So I will remove this portion of our proposed resolution, in favor of discussing the other comments in the set that we've covered. So will put into the resolution [the following words]: "Alternate resolution: It is believed that the use of the 'schedule pending' bit is required in certain polling scenarios; therefore the removal remark is declined. The remainder of the comment is accepted." Instead of "delete all references...". This applies to a number of the comments in our set of comments.*

8.2.1.16. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*

- 8.2.1.17. KeithA: *The next comment [662] is to define dot11ScheduleTimeOut, which we will not accept [because there is no proposed resolution].*
- 8.2.1.18. JavierP: *I'll write the definition.*
- 8.2.1.19. KeithA: *Change "may": so the comment is accepted.*
- 8.2.1.20. SrinikK: *Need to make that consistent.*
- 8.2.1.21. KeithA: *Our feeling was that the actual language used is editorial.*
- 8.2.1.22. SrinikK: *Ok.*
- 8.2.1.23. KeithA: *Comment [201] on setting the APSD.*
- 8.2.1.24. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.1.25. KeithA: *[Comment 202 is] another version of the same issue; we had not fully defined all the sides setting the bit.*
- 8.2.1.26. SrinikK: *Think we shouldn't introduce the term "parent" here.*
- 8.2.1.27. KeithA: *Agree, and am changing that.*
- 8.2.1.28. SrinikK: *Does this new text go into clause 7?*
- 8.2.1.29. KeithA: *We weren't clear about that, so we would leave that up to editor.*
- 8.2.1.30. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.1.31. KeithA: *Comments [418, 1441] that the APSD bit is not an extended capability bit. We accepted these straightforwardly.*
- 8.2.1.32. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.1.33. KeithA: *[Comment 1747] "a Automatic" -> "an Automatic" is editorial, not technical.*
- 8.2.1.34. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.1.35. KeithA: *Comment [203] to have consistent phrase for APSD; we just replicated this throughout.*
- 8.2.1.36. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.1.37. KeithA: *Items b) and f) comment [819, 820] on use of "state" and "mode". We decided that these are identical in usage, so we decided to use "mode" in all cases and delete "state".*
- 8.2.1.38. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.1.39. KeithA: *Next [comment 875] is how traffic should be sequenced as it comes out of an APSD. The recommendation is an alternate resolution to remove the last portion of the statement, and to order data on a per priority / per station basis.*
- 8.2.1.40. BobM: *This really is just saying that must preserve the original order per priority per station. Really just a clarification.*
- 8.2.1.41. KeithA: *I was the original commentator and was willing to let this go, but others thought we should make this change.*
- 8.2.1.42. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.1.43. KeithA: *Broadcast, multicast rule clarification [comments 1073 and 1488].*
- 8.2.1.44. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.1.45. KeithA: *Comments [1569 and 1748] on d) and f) were both accepted.*
- 8.2.1.46. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.1.47. KeithA: *[In comment 129] Terms "APSD beacon" and "Wakeup beacon" weren't defined; we combined them into the latter and defined the term.*

- 8.2.1.48. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.1.49. *KeithA: Next [comment 204] is the QoS Ack problem again with the 'more data' bit.*
- 8.2.1.50. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.1.51. *KeithA: Next [comment 440] is about clause d) is about PS-poll frame. We suggest an alternate resolution to add an additional bullet that provided the corresponding definition for the AP.*
- 8.2.1.52. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.1.53. *KeithA: Next [comment 821] is the same comment and solution.*
- 8.2.1.54. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.1.55. *KeithA: That's it. I'll insert a new revision of this document into to-doc-keeper.*

8.2.2. Annex A and General ad-hoc comment resolution group

- 8.2.2.1. *Document 11-03-230r1-E-940242,_Annex_A_and_General_comments.xls*
- 8.2.2.2. *JohnK: The motion yesterday covered the first set of comments in this document, so are done already. Comment 564 is the first in this new set.*
- 8.2.2.3. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.2.4. *JohnK: Comment 1064 and resolution.*
- 8.2.2.5. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.2.6. *JohnK: Comment 913 is that PICS needs to be rewritten. Our resolution is to delete CF13 and CF14 and replace references by CF12.*
- 8.2.2.7. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.2.8.
- 8.2.2.9. *JohnK: We deferred comment 877 to the [?] group.*
- 8.2.2.10. *JohnK: Comment 763 was declined, because we thought the PICS is clear.*
- 8.2.2.11. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.2.12. *JohnK: Next Comment 81 was declined.*
- 8.2.2.13. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.2.14. *JohnK: The next is by Carlos Rios on DLP.*
- 8.2.2.15. *JohnK: Comment 49 Carlos did go over yesterday, and, based on the results of that vote, we declined this comment.*
- 8.2.2.16. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.2.17. *JohnK: Comment 46 is an implementation issue and beyond the scope of this standard.*
- 8.2.2.18. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.2.19. *JohnK: Comment 67 is on no-Ack..*
- 8.2.2.20. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*

- 8.2.2.21. JohnK: Comment 85 to eliminate QIBSS. We declined it under the belief that there exist [?].
- 8.2.2.22. JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.
- 8.2.2.23. JohnK: Comment 110 we believe is invalid as it does not refer to the draft..
- 8.2.2.24. JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.
- 8.2.2.25. JohnK: Comment 178 is also deferred to the APSD group.
- 8.2.2.26. JohnK: Comment 387 was accepted based on a resolution from Portland.
- 8.2.2.27. JohnK: Comment 388 was accepted.
- 8.2.2.28. JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.
- 8.2.2.29. JohnK: Comment 389 was accepted and a new bit will be defined by the editor in the extended capability bit. (QACK bit)
- 8.2.2.30. JohnF: Is there any objection to this resolution?
- 8.2.2.31. Srinik: I thought we had removed that line in Portland.
- 8.2.2.32. MatthewS: There is another reference
- 8.2.2.33. CharlesW: I have a question: piggyback anything is not defined in the draft, but used only twice in the draft.
- 8.2.2.34. GregC: Piggyback is not a well defined term. Clause 3.14 does put it in double quotes. There's no formal name give for that. You can invent a new formal name.
- 8.2.2.35. MatthewS: The term is used in the base standard.
- 8.2.2.36. SidS: That's a different usage.
- 8.2.2.37. Srinik: The usage is clear enough.
- 8.2.2.38. JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.
- 8.2.2.39. JohnK: Comments 390, 391 are deferred to other groups.
- 8.2.2.40. JohnK: Comment 442 promised a later paper, which never came, so we declined it.
- 8.2.2.41. JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.
- 8.2.2.42. JohnK: Comment 643 was partially accepted about MIB variables.
- 8.2.2.43. Srinik: I have no idea what that means.
- 8.2.2.44. GregC: The commentator seemed to be saying that the text of the normal algorithms was using x, y and z and not making it clear that these values were coming out of the MIB variables. So the direction to the editor was to find those MIB variables.
- 8.2.2.45. Srinik: Clause 9.1 used a shorthand notation for this.
- 8.2.2.46. GregC: Commentator was referring to those in general in the document, so we regarded it as editorial.
- 8.2.2.47. Srinik: Should I check those AIFS etc.
- 8.2.2.48. JohnK: We thought not.
- 8.2.2.49. JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.
- 8.2.2.50. JohnK: We accepted comment 649 with directions to create a definition.
- 8.2.2.51. JohnK: Comment 709 was declined because of defined usage for "shall". See comment 745.
- 8.2.2.52. Srinik: Clause 7 has only one "shall" in it.
- 8.2.2.53. JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.

- 8.2.2.54. *JohnK: Comment 711 was also declined because of defined usage for "shall". See comment 745.*
- 8.2.2.55. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.2.56. *JohnK: Comment 721 was accepted.*
- 8.2.2.57. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.2.58. *JohnK: Comment 722 had the same resolution.*
- 8.2.2.59. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.2.60. *JohnK: Comment 891 to remove group Ack because we thought group Ack is useful.*
- 8.2.2.61. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.2.62. *JohnK: Comment 906 to remove APSD, with similar resolution.*
- 8.2.2.63. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.2.64. *JohnK: Comment 911 requires more work. This will be brought up again later (marked in red).*
- 8.2.2.65. *JohnK: Comment 989 was declined because the PICS sufficiently defines what is needed.*
- 8.2.2.66. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.2.67. *JohnK: Comment 990 is identical to 989 with same results.*
- 8.2.2.68. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.2.69. *JohnK: Comment 1795 was declined because retry limits are maximum values.*
- 8.2.2.70. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.2.71. *CharlesW: For my own information: on retries you keep retrying forever until limit.*
- 8.2.2.72. *JohnK: Every frame has its own retry limit.*
- 8.2.2.73. *CharlesW: You wouldn't have a higher priority come in?*
- 8.2.2.74. *JohnK: I believe not.*
- 8.2.2.75. *JohnK: Comment 1796 was accepted as editorial.*
- 8.2.2.76. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.2.77. *JohnK: Comment 1797 on DLP was reclassified as editorial.*
- 8.2.2.78. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.2.79. *JohnK: Comment 28 was declined because no definition was offered, though we would be happy to entertain a suggestion later.*
- 8.2.2.80. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.2.81. *JohnK: And this group is done.*
- 8.2.2.82. *MatthewS: I walked in late; will there be a bulk vote to accept all the comments of this group?*
- 8.2.2.83. *JohnF: No, because we're accepting each one separately.*

8.2.3. **Clause 7 ad-hoc comment resolution group**

- 8.2.3.1. *Document 11-03-063r3-E-LB510_Comment_Resolution_Clause_7.xls*

- 8.2.3.2. SрниK: *[This] document is on the server. Comment 144 is to change text as for comment 286. Comment 286 is the same, with proposed text, which we accepted. Comment 424 is the same, again.*
- 8.2.3.3. JohnF: *Is there any objection to this resolution for all three comments? Hearing none, this resolution is passed.*
- 8.2.3.4. SрниK: *Comment 476 was declined because there really is not much overhead and it is helpful to avoid wraparounds.*
- 8.2.3.5. SidS: *The sequence numbers aren't a problem.*
- 8.2.3.6. SрниK: *We felt they aren't that much complexity.*
- 8.2.3.7. SidS: *This eliminates the need for keeping a counter in the AP, but more bytes that you need in the table.*
- 8.2.3.8. GregC: *You wouldn't even notice it.*
- 8.2.3.9. SidS: *I'm not convinced.*
- 8.2.3.10. JohnF: *You object to this?*
- 8.2.3.11. SidS: *Yes, but we could take a strawpoll.*
- 8.2.3.12. JohnF: *Let's move on to get the ones that aren't controversial.*
- 8.2.3.13. SрниK: *Comment 698 was classified as editorial with a suggestion.*
- 8.2.3.14. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.15. SрниK: *Comments 288 and 426 were declined and resolved by comment 166.*
- 8.2.3.16. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.17. SрниK: *Comment 289 about ack policy being unclear was accepted, with direction to use "No Ack" policy for CF-Ack frames.*
- 8.2.3.18. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.19. SрниK: *Comment 291 is to remove the bit, because we felt it was different from more data bit, which we declined.*
- 8.2.3.20. KeithA: *I disagree with this resolution.*
- 8.2.3.21. JohnF: *Again, let's move on to get the ones that aren't controversial.*
- 8.2.3.22. SрниK: *Comment 857.*
- 8.2.3.23. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.24. SрниK: *Comment 934 was declined because this is covered under data type frames.*
- 8.2.3.25. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.26. SрниK: *Comment 481 was accepted.*
- 8.2.3.27. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.28. SрниK: *Comment 701 requested mathematical expression for exact definition and was accepted and classified as editorial.*
- 8.2.3.29. BobM: *Doesn't the resolution change to the next multiple?*
- 8.2.3.30. SрниK: *Yes, we round up.*
- 8.2.3.31. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.32. SрниK: *Comment 1092 was accepted, but incomplete resolution.*
- 8.2.3.33. JohnF: *So move to the next comment.*
- 8.2.3.34. SрниK: *Comment 1093 has an alternate resolution with a queue size value of 255 used.*
- 8.2.3.35. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*

- 8.2.3.36. *SriniK: Comment 1094 also has an alternate resolution, including replacing "frame body" by "MSDU" to exclude the current MSDU.*
- 8.2.3.37. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.38. *SriniK: Comment 428 to use 255 to indicate unknown or unspecified duration was declined because we didn't want to allow that value.*
- 8.2.3.39. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.40. *SriniK: Comment 145 is a duplicate of comment 166 that we resolved yesterday.*
- 8.2.3.41. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.42. *SriniK: Comment 858 about including PHY requirements we accepted.*
- 8.2.3.43. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.44. *SriniK: Comment 935 to remove the duration request field was declined because the usage is described in clause 9.*
- 8.2.3.45. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.46. *SriniK: Comment 292 was accepted to delete changes to that subclause.*
- 8.2.3.47. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.48. *SriniK: Comment 146 was accepted as in document 03/093r1.*
- 8.2.3.49. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.50. *SriniK: Comment 238 has the same resolution as comment 146 from Fort Lauderdale.*
- 8.2.3.51. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.52. *SriniK: Comment 482 about the word "polled" excludes the case of downlink RTS frames was accepted and the word "polled" was deleted.*
- 8.2.3.53. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.54. *SriniK: Comment 936 to make receive action generic was accepted, with the correction that it is about a different subclause.*
- 8.2.3.55. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.56. *SriniK: Comment 483 was accepted.*
- 8.2.3.57. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.58. *SriniK: Comment 859 about when CTS frames are sent was declined because the polled TXOP text is consistent.*
- 8.2.3.59. *MatthewS: You can still precede it with an RTS.*
- 8.2.3.60. *SriniK: Yes, this was just about semantics.*
- 8.2.3.61. *KeithA: I agree.*
- 8.2.3.62. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.63. *SriniK: Comment 239.*
- 8.2.3.64. *JohnF: Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.65. *SriniK: Comment 703 has a very nice paragraph as a suggested solution. This was accepted, except for the last sentence, which was for legacy, but was not there in the base standard.*

- 8.2.3.66. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.67. Srinik: *Comment 484 on block Ack request was accepted.*
- 8.2.3.68. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.69. Srinik: *Comment 485 on no such thing as "sequence control number" was accepted.*
- 8.2.3.70. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.71. Srinik: *Comment 937 about note in text was declined because it only ensures time.*
- 8.2.3.72. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.73. Srinik: *Comment 938 about DurationID frame definition was partially accepted, but part declined because non-QoS STAs can't send GroupAckReq frames and QSTAs do not follow the DurationID rules.*
- 8.2.3.74. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.75. Srinik: *Comment 1095 was accepted with resolution to comment 938.*
- 8.2.3.76. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.77. Srinik: *Comment 119 was declined; to extract the starting sequence control you have to multiply by 16.*
- 8.2.3.78. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.79. Srinik: *Comment 29 was accepted and a good idea.*
- 8.2.3.80. JohnF: *Is there any objection to this resolution? Hearing none, this resolution is passed.*
- 8.2.3.81. Srinik: *That is the set of easy ones so far for this group.*

8.2.4. Motion to Empower the WG for an Interim meeting

- 8.2.4.1. JohnF: *I overlooked a motion in new business for a motion to empower the working group at the Interim meeting in case we can send out a recirculation ballot.*
- 8.2.4.2. JohnK: *Move to empower the WG during the Interim meeting to make any decisions regarding the LB#51 comment resolution process including the approval of a new TGe draft and initiating a Recirculation ballot.*
- 8.2.4.3. SidS: *Second.*
- 8.2.4.4. AmjadS: *Amendment to insert "May 03" before "Interim meeting"*
- 8.2.4.5. JohnF: *Is there any objection to this amendment? Hearing none, this amendment is passed.*
- 8.2.4.6. JohnF: *Vote on the motion.*
- 8.2.4.7. JohnF: *The vote is 31:0:1, the motion passes unanimously.*
- 8.2.4.8. AmjadS: *We had an announcement but no motion on the interim meeting.*
- 8.2.4.9. Srinik: *I move to approve announcements (1) and (2) in Document 03/256r0 about the April-May Ad-Hoc meeting*
- 8.2.4.10. JavierP: *Second.*
- 8.2.4.11. JohnF: *Is there any objection to this motion? Hearing none, this motion is passed.*

8.2.5. Motion on Roaming Improvements

- 8.2.5.1. *JohnF: Mark, you wanted to make a motion with respect to your earlier paper.*
- 8.2.5.2. *MarkB: This refers to units of 32 microseconds per seconds.*
- 8.2.5.3. *MarkB: I move to resolve the comments listed in Document 03/196r2 by incorporating the changes to the draft text in 03/196r1 into the draft.*
- 8.2.5.4. *SriniK: Second*
- 8.2.5.5. *JohnF: Is there any discussion on this motion. Hearing none, is there any objection to this motion? Hearing none, this resolution is passed unanimously.*

8.2.6. 9.10.1 comment resolution ad-hoc group

- 8.2.6.1. *Document 11-03-064r4-E-LB52_comment_resolution_clause_9.10.1.xls.*
- 8.2.6.2. *DuncanK: Comment 1058 to make distributed admission control description informative was declined as we thought this detail was needed. Comment 175 on figure 47 we designated editorial. Comments 519, 615, 616, 617, 618, 620 to delete or modify figure 47.1 were fixed by removing the figure. Comment 961 was classified as editorial. The editorial comments we passed over. I move to accept the resolutions marked AR (green) in this document.*
- 8.2.6.3. *CharlesW: Is this document on the server?*
- 8.2.6.4. *DuncanK: Earlier versions are, but r4 is not.*
- 8.2.6.5. *Hans: Second.*
- 8.2.6.6. *JohnF: Since the document is not on the server, you can call this motion out of order. Otherwise, if you think you need no further review, we can move on with the motion. Explicitly, does anybody want to call this motion out of order due to unavailability on the server.*
- 8.2.6.7. *MatthewS: Just a question: what changed between the versions?*
- 8.2.6.8. *DuncanK: Just the changes listed just now.*
- 8.2.6.9. *JohnK: Again, for the second time, explicitly, does anybody want to call this motion out of order due to unavailability on the server. Hearing none, is there any discussion on this motion? Hearing none, is there any objection to this motion? Hearing none, this motion is passed.*
- 8.2.6.10. *DuncanK: Now we can cover the red-marked comments, that I tried to put into buckets. So then I listed the number of comments related to each bucket. The two bit buckets are EDCF a distributed admission control. Then these buckets were split up in terms of their suggested solutions (see Document 03/064r4). I ask everyone to read 03/252r0 which contained proposed resolutions to these.*
- 8.2.6.11. *SidS: I would like to make a motion to distributed admissions control.*
- 8.2.6.12. *MatthewS: We're out of time so I would only ask for orders of the day. We have no time to discuss this, anyway.*
- 8.2.6.13. *JohnF: We did about 120 comment this meeting, so we have about 370 total, between this and the Portland meeting. So if equal progress is made in the New York meeting, we would have about 500 resolved before Singapore meeting.*

8.2.7. Closing

- 8.2.7.1. *JohnF: If there is no objection, this session is over. Hearing no objection, this session is closed.*
- 8.2.7.2. *Meeting closed at 9:20pm.*

**IEEE P802.11
Wireless LANs**

Title

Date: March 11,2003

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Abstract

IEEE 802.11 Plenary Session minutes for TGf meeting in DFW March 2003.

1. Meeting called to order at 1:05 pm
2. Welcome from Dave Bagby.
3. Agenda
 - a. Called to order
 - b. Adopt agenda
 - c. Admin stuff
 - d. Review Status/goals & RC2 results
 - e. RC2 Ballot Comment response
 - f. Look at new business
 - g. Adjourn
4. Motion to adopt agenda: Moved: Bob O. 2nd Richard Paine Vote: unanimous
5. Matters from the minutes from Sept's minutes
 - a. No matters arose from the minutes
 - b. Moved to accept the minutes from Jan,
 - i. Moved: Tim O. 2nd Richard P.
 - c. Vote: unanimous
6. Goals and status for March 2003
 - a. 11-03-166r0-F-TGf original comments.
 - b. Official Ballot Summary
 - i. 73 Eligible people in the Sponsor Ballot Pool
 - 57 affirmative
 - 2 negative
 - 4 abstentions
 - 59 votes received = 86% returned, 6% abstention
 - ii. The 75% affirmation requirement is being met.
 - 57 affirmative votes
 - 2 negative
 - 59 votes = 96% affirmative
7. Ballot Results Review
 - a. 0 new no votes as of the end of Jan, but after RC2, we now have 2 new no's, and 4 comments.
8. Comment Processing:
 - a. ID 109: Band network management health messaging.
 - i. Response: Comment is beyond the scope of the recirculation ballot, as it does not refer to text that changed for RC2 or text that was affected by text that changed.
 - ii. Moved: Jon R. 2nd Peter E, Vote: Unanimous
 - b. ID 110: Patent Claims between RC1 and RC2
 - i. Comment requests that patents are evaluated to their impact on the Task Group.
 - ii. Patent information received from Agere and Nokia
 - iii. Agere has identified the patent numbers
 - iv. Nokia has not identified the patent numbers, but rather only that they have complied with patent policy.
 - v. Review of the patents was then done.
 - vi. Commenter requests to know the group's position.
 - vii. **IEEE-SA Patent Policy was read.**
 - viii. Reviewed the list of companies who have submitted patent statements.
 1. Agere, Nokia, Trapeze Networks,
 - ix. Proposed Resolution: The task group has considered the letters of assurance provided to the IEEE by Agere, Ericsson, and Trapeze Networks, meet with the IEEE requirements for letters of assurance and state that the companies are willing to license the technology involved per IEEE rules, and that this is sufficient to forward the TGf draft to RevCom for Publication.
 - x. Moved to accept Proposed Resolution: Jon R. 2nd Bob M. Vote: Unanimous
 - c. ID 107, 108: Mgt. MIB
 - i. Management MIB was removed requested to move it back.
 - ii. Look at the history of why were are here without the MIB, Jan the MIB was removed.
 - iii. Look at a MIB compromise to resolve the comments. Taking the previous MIB, and removing some of the contentious entries. Concern over whether the MIB was properly formed as well. Concern that the Signal Strength value if it comes from RSSI in the

standard does not have a unit associated with. Contention is that the existence of dBm measurements is reported, but it is not part of the standard.

1. If a company reports that it is reporting dBm, but it is not in the standard.
 2. Removed several items of contention
 3. Removed security control problem entries
- iv. There are 3 choices: 1. Do nothing, leave as 5.0; RC2 proposal, Put Back RC1 Proposal.
1. Straw poll proposal: 1: 4 2:2 3:0
 2. Motion to Leave D5.0 as is:
 - a. By Tim O, 2nd Peter E.
 - b. Discussion: Question asked Why. The MIB parameters are either in error, wrong structure, or out of scope. Adding it during the Recirculation time makes it a poor time to try to add it. Some of the parameters cannot be derived from compliant systems. Referring to the minutes is not adequate, but one of the members indicated that the ballot response had the indicated information.
 - i. Commenter is not sufficiently satisfied as a previous comment position was reversed in Jan, and no information was sent back to the original commenter on this specific comment.
 - ii. Look back at the Jan Comment database for response to the two comments that caused the MIB to be removed. The official response was in the report, but the private notes were not displayed.
 - iii. The history of why the MIB was added was repeated. Comment in the first Sponsor ballot caused the MIB to be added. Then a proposal was made to provide the MIB in 4.1. There was a proposal for RRM that needed to have some information stored someplace, and then a way to allow other groups to hold data in the APs in MIBs. The MIB was provided as a proposal to get a compromise to the Group. The functional requirements that the original group had agreed on are not completely met without the MIB.
 - iv. Some comment for the need for the MIB or that the MIB was out of scope seemed to cause more contention. And a discussion on what is or is not in scope was then averted.
 - v. The definition of a MIB should be done in a Standard not a Recommended practice was expressed.
 - vi. The MIB definition is probably a good thing, but the location of where it is defined is the issue. Also, the WG didn't get a chance to see the MIB, but then any change after the draft goes to Sponsor ballot.
 - vii. Request to review the PAR was made. The commenter stated that the PAR is sufficient to agree that the MIB is not out of scope.
 - viii. Change proposed response to:
 1. A good part of the Mgt MIB that was in D4.1 and removed for D5.0 was inappropriate as it involved parameters that can't be implemented from 802.11 compliant systems.
 2. If we find that the MIB is desirable, but state that it should be in a standard rather than in a Recommended practice.
 - ix. Management is not in TGk, but rather just measurement. Being able to ask about per station. There were some counters and retries were repeated in some other groups.
 - x. Two issues: we think that the MIB should be done in a Standard, and the per Station info; also overlap with other TGs.
 - xi. Add three sentences:
 1. The TG thinks that the functions of the Mgt MIB would be better accomplished in a standard doc

- rather than a recommended practice doc and that this would also be a better approach for per station info.
- 2. The Mgt MIB in D4.1 had some overlap with other chartered TGs(e.g. TGe, TGi) and TGF didn't want to reintroduce conflict (This would have not been an issue with the suggested remedy from Comment 108, but would have been for comment 107 from RC2).
- 3. The TG declines the suggested remedy from 107.
 - 3. No further discussion
 - 4. Vote: 9,1,0 motion passes.
- v. Comment was then posted for both comments.
- d. Comment 108 and comment 107 are closed by the same action.
- e. Comment Resolution Summary:
 - i. Accepted 0
 - ii. Declined: 4
 - iii. Total Comments: 4
 - iv. All comment resolutions are in Draft 6.0
 - 1. Membership lists are the last item added.
 - 2. Chair to provide just prior to submission to RevCom.
- f. TGF Action 1:
 - i. Send Draft 6.0 to Recirc 3.
 - ii. Conditionally forward draft 6.0
- 9. Recessed 3.00pm
- 10. Reconvene: 3:30pm
- 11. Prepare Slide for TGf Recirc #3.
- 12. IETF Liaison
 - a. Radius Attributes
 - i. Request to take the Radius attributes and put them into an IETF draft and request comments from the IETF on what we have done that.
 - ii. Issues: the TG and the WG doesn't own the copyright
 - iii. 802.1x did it, but it was done in the IETF first, and doesn't show us what it is.
 - iv. In our case, the portion of the RADIUS attributes our in the copyright document.
 - v. The reason for this is that the IETF wanted to comment on it.
 - vi. Question is where do comments get sent?
 - vii. Formal comments would be submitted to the IEEE, and the WG would then get the proper response.
 - viii. The idea is to have the IETF members purchase and get the copy of the doc, and provide the comments to the group.
 - ix. The comments from Bernard are on the custom attributes that are in the Doc. Service type, username, and userpassword are the contentious attributes. Due to how we are using the attributes.
 - x. Discussion on the appropriateness of even responding.
 - xi. Discussion on what the right response could be.
 - xii. Question on how to even get comments back to the TGf if needed.
 - xiii. Concern that the IEEE has the doc, and they should provide comment via the IEEE
 - xiv. Motion: 0) Send a communication via the 802.1 WG IETF liaison to the AAA IETF group that they may review TGf doc if interested.
 - xv. 1) Ask if the IEEE will make TGf doc avail (for \$) pre publication for IETF members.
 - xvi. 2) If IETF has comments, they should be submitted to IEEE as a formal request for interpretation by the 802.11 WG.
 - xvii. Moved: John V. 2nd Bob M.
 - xviii. Vote: 6, 1, 0
- 13. Session output docs
 - a. 11-03-166R1-F-TGF Recirc 2 comment files
 - b. 11-03-165 are the minutes
 - c. TGf Draft 6.0 (no changes from 5.0 just no revision bars)
- 14. May Objectives:
 - a. Do whatever is needed as a result of SB recirculation ballot 3.

- b. Discussion on possible paths.
- 15. After the group adjourns, the chair requests help in creating the significant contributors list.
- 16. Meeting Adjourned: Moved: Jon R. 2nd Bob M.

Significant Contributions:

Tom T., Justin McCann, Bernard Aboba, Jon R. Richard P,
Bob M, John Vollbrecht, David Bagby, Kevin Hayes, Liwen Wu,
Bill Arbaugh, Butch Anton;

**IEEE P802.11
Wireless LANs**

Minutes for January 2003 meeting of TGg

Date: January 10-13, 2003

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Chair: Matthew Shoemake
Vice-chair: John Terry
Secretary: Joe Mueller

***Monday Mar 10, 2003
Session 1: 4:00-5:30PM***

Matthew Shoemake calls meeting to order.

1. Matthew Shoemake presents current status, schedule and agenda of 11g.
 - a. Frank Howley: Why not take the standard as it exists rather than attempt to do comment resolution and risk that more NO votes may result possibly causing a subsequent letter ballot to fail?
Matthew Shoemake: This is a risk. Our final approval comes at ExCom/RevCom and RevCom will reject the final draft if we have not made a clear attempt to address the comments of the NO voters.
 - b. Matthew Shoemake: We have time for up to 3 recirculation ballots of 15 days each before the 6/11/03 RevCom meeting. Suggested TGg Ad-hoc meeting for comment resolution in the April 14th time frame. Looking for meeting sponsors.
 - c. Frank Howley: We are going for 3 sponsor ballots; of the 11 NO votes, how many do we have to convert to YES before we declare we are finished.
 - d. Matthew Shoemake: Three sponsor ballots are just the maximum we can have before the next RevCom meeting; we may not need all three or we may need more. But, technically, we do not have to convert any NO votes to YES votes, we can carry NO votes to RevCom provided we have addressed the comments in an appropriate manner
2. Tentative Agenda: 11-03-145r0.
 - a. Marcus Gahler: What happened to comments on Letter Ballot 54?
 - b. Matthew Shoemake: They will be automatically included into our list of comments to be addressed this week.
 - c. Frank Howley: As we go through the comments, are we going to take votes in the room to see if the resolution would generate any new NO votes?
 - d. Motion to adopt agenda by Matt Fischer
 - i. Seconded by Frank Howley
 - ii. The motion passes 25/0/0
3. Review IEEE patent policy.
 - a. Matthew Shoemake read the IEEE patent policy.
 - b. Matthew Shoemake: Is there anyone in the room that would like to give notice of patents pertaining to TGg? No one stepped forward.
 - c. Matthew Shoemake: Is the IEEE patent policy understood by all? No one stepped forward.

- d. Opportunity was given to the working group to identify any patents that may pertain to the work in TGg
 - e. Matthew Shoemake: Is there any questions regarding the policy? No one stepped forward.
 - f. Steve Halford: Are you required to notified the chair of any patents?
 - g. Matthew Shoemake: Noted that the policy prohibits coercion, but the policy does request letters where patents are known.
4. Review and approve minutes of the January Ft. Lauderdale meeting (document 11-03-081)
 - a. Motion to approve minutes by John Terry
 - i. Seconded by Frank Howley
 - ii. Approved by unanimous consent
 5. Chair proposes that comments be divided into subgroups for resolution. Comments to be divided into subgroups over the recess.
 6. The session adjourned at 4:55pm until 7:00pm.

Monday Mar 10, 2003***Session 2: 7:00-9:30PM***

1. The group divided into 4 sub-groups to address comments in an ad-hoc fashion. The proposed resolutions will be brought back to the group for final discussion and approval. The following 4 sub-groups were formed:
 - a. Appendices lead by John Terry
 - b. Editorial lead by Carl Andren
 - c. MAC lead by Matt Fischer
 - d. Clause 19 lead by Steve Halford
2. Comment resolution in the 4 ad-hocs consumed the remaining session time.
3. The session adjourned at 9:30pm.

Tuesday Mar 11, 2003***Session 3: 10:00-12:00AM***

1. Group continued comment resolution in the 4 sub-groups formed on Monday.
2. The session adjourned at 12:00pm.

Tuesday Mar 11, 2003***Session 4: 1:00-3:00PM***

1. Group continued comment resolution in the 4 sub-groups formed on Monday.
 - a. Appendices group lead by John Terry completed proposed comment resolutions.
 - b. Clause 19 group lead by Steve Halford completed proposed comment resolutions.
2. The session adjourned at 3:00pm.

Tuesday Mar 11, 2003***Session 5: 3:30-5:30PM***

1. The MAC group lead by Matt Fischer continued comment resolution.
 - a. MAC group lead by Matt Fischer completed proposed comment resolutions.
2. Carl Andren continued incorporating editorial comments into the draft.
3. The session adjourned at 5:30pm.

Wednesday Mar 12, 2003

Session 6: 8:00-10:00PM

1. Chair announced updated comment resolution file 11-03-219r5-G-TGg_SB_1_Comment_Resolution.xls available on IEEE document server.
2. Chair asked if any submissions for presentation to the group. None noted.
3. Group to address the comments resolutions under the Appendix tab of document 11-03-219r5-G-TGg_SB_1_Comment_Resolution.xls
 - a. Row 2: Make PC27 through PC29 applicable for all 802.11 and not just 11g. Some concern that this is beyond the scope of our PAR. Carl asked if PC28 and PC29 already exist in 802.11-1999 Section 9.6 – Carl checked and confirmed that they do not (only has one line for multi-rate support). Comment rejected by unanimous consent as it is outside the scope of our PAR.
 - b. Row 4: Comment that ERP19 is not captured correctly. Geert Awat asked if these apply to both CCA modes 1 and 5. Carl and Matthew noted that the commenter wanted simultaneous CCA on long, short and OFDM preamble and was independent of CCA mode. Steve Halford noted that the proposed comment resolution took a step too far by attempting to split ERP19 into several for each CCA mode. Group agreed by unanimous consent to accept what the commenter proposed and not what the comment resolution group proposed.
 - c. Row 5: Commenter noted that there are no changes proposed for the 802.11 state machine; however, there are significant changes in the text (see Annex C). Matthew noted changes to updated SDL and highlighted changes incorporating CTS to self and RTS/CTS and pointed out notes that indicate that these two branches are for protection mechanisms. Matthew noted that this is the SDL for DCF only. Changes to SDL adopted by unanimous consent.
 - d. Row 7 and 8: Same resolution as Row 5 adopted for Row 7 and 8 and accepted by unanimous consent.
 - e. Row 11: Similar issue and resolution as in Row 5 (i.e. changes to SDL have not incorporated specific changes made by TGg to the MAC). No discussion. Comment countered – accepted by unanimous consent.
 - f. Row 13: Commenter notes that the 'informative' subclause uses normative language, e.g. 'may'. Subcommittee could not find any normative language. Rejected by unanimous consent (no discussion).
 - g. All rows marked as “unanimous consent” as indicated in column N have proposed resolutions that have received unanimous consent within the ad-hoc committee. The intent of the chair is to accept the resolutions as a single block rather than individually.
 - i. Chair asked if there are any comments marked for unanimous consent in column N of the Appendix tab that should be discussed in the group and not accepted in bulk.
 - ii. Additional supporting text was added to Rows 3, 10 and 14 to emphasize the reasoning of the group’s response.
 - iii. Steve Halford requested that Row 9 be pulled out of consideration for unanimous consent and be discussed in Clause 19 Row 21 - agreed.
 - iv. Chair asked if anyone needed more time or if any comments should be pulled out of unanimous consent (other than Row 9) – no one indicated that more time was required.
 - v. Move to adopt all comments marked “unanimous consent” in column N by Ken Clements
 1. Seconded by Matt Fisher.
 2. No further discussion; no objections.
 3. Motion passed 24/0/0
4. Group to address the comments resolutions under the Clause 19 tab of document 11-03-219r5-G-TGg_SB_1_Comment_Resolution.xls

- a. Row 5: Request to add DSSS as an enumerated type to the MODULATION parameter of Section 19.2. No discussion on proposed resolution. Adopted by unanimous consent.
 - b. Row 9: Commenter requests removal of optional ER-PBCC mode. Commenter requested a straw poll to gauge interest in keeping ER-PBCC as an optional mode. No objection to taking a straw poll as commenter requested.
 - i. Straw poll: "All those that still care about ER-PBCC"
 - ii. Yes: 10, No: 12
 - iii. No objection to adopting resolution to reject commenter's proposal to remove ER-PBCC.
 - c. Row 14: What is the effect of setting Modulation Code Type = NULL? Terry Cole – the reason for NULL is that some PHY's do not support more than one modulation type and thus this primitive has no meaning to them. Terry Cole suggests we reject the commenter's resolution. Call for discussion. No objections, accepted by unanimous consent.
 - d. Row 20: Locked clock requirement. Members commented that there is a known ratio between the clock and carrier frequencies. Two clocks could be matched but will have slightly different jitter. No further discussion on proposed resolution. No objections, accepted by unanimous consent.
 - e. Row 21: Optional use of protection mechanisms. Steve Halford proposes that we deal with all comments related to protection mechanisms together. Discussion of Row 21 deferred. (Rows 21, 27 and 28 are related to protection mechanisms).
 - f. Row 22: Commenter requested additional text to explain the coexistence mechanisms. Steve Palm noted that specifications are not tutorials. Discussion deferred to next session.
5. The session adjourned at 10:00am. Chair noted meeting venue has changed to Nova for next session.

Wednesday Mar 12, 2003

Session 7: 1:00-3:00PM

1. Chair announced availability of 11-03-219r7-G-TGg_SB_1_Comment_Resolution.xls.
2. Continue Clause 19 comment resolution:
 - a. Row 22: Steve Halford reworded the resolution comment. No further discussion, no objections, accepted by unanimous consent.
 - b. Row 21/27/28: Steve states that the intention of the draft is that when the AP requires protection mechanisms, that the 11g device be capable of sending OFDM frames using protection mechanisms to properly set the NAV of legacy devices. Matt Fischer comments that the 11g device is not just capable of sending protection mechanisms but that it is required. Matthew proposed that we divide the questions into two, the first being whether or not protection mechanisms should be mandatory. Terry Cole suggests that there are two separable cases for when protection mechanisms should be made mandatory, when a station associates and when BSS's overlap and they should be handled separately. Matthew and Steve propose several straw polls:
 - i. Should it be mandatory to set the Use_Protection to 1 when a legacy device associates?
 - ii. Should it be mandatory to set Use_Protection to 1 in the case of an overlapping BSS, i.e. in the "presence of" legacy devices?
 - iii. Should it be mandatory to use protection mechanisms with OFDM frames when the use thereof results in higher throughputs?

Questions raised as to what throughput meant and how it would be measured. Steve suggested that throughput is based on modes without CTS/RTS or CTS-to-self compared to those modes that don't require protection mechanisms. Dick and Bill Carney request a 4th straw pole:

- iv. If you can use OFDM, should you?

- v. If you can use OFDM and the AP is requiring the use of protection mechanisms, should you use OFDM with protection mechanisms thereby disallowing the option to fall back to a non-OFDM rate?

Dick is concerned that poll 3 states a rule but not how to compute it. Matt Fischer says that 5 is more restrictive and not what the commenter intended. Suggests that we return to the commenter's proposal. Matthew proposed removal of 4th and 5th straw polls and proposed the following:

- vi. When operating in a mixed network of ERP and non-ERP devices where the beacon sender is indicating that protection mechanisms shall be used, ERP devices shall user protection mechanisms in conjunction with OFDM data frames when the achieved throughput of doing so is higher than that which could be achieved by using a modulation that does not require the use of protection mechanisms. This is to insure that ERP devices achieve their expected throughput enhancement over Non-ERP devices in the mixed network.

The group agreed to holding the following straw polls:

- vii. Should it be mandatory to set the Use_Protection to 1 when a legacy device associates?
YES: 27 NO: 10
- viii. Should it be mandatory to set Use_Protection to 1 in the case of an overlapping BSS, i.e. in the "presence of" legacy devices?
YES: 8 NO: 23
- ix. When operating in a mixed network of ERP and non-ERP devices where the beacon sender is indicating that protection mechanisms shall be used, ERP devices shall user protection mechanisms in conjunction with OFDM data frames when the achieved throughput of doing so is higher than that which could be achieved by using a modulation that does not require the use of protection mechanisms. This is to insure that ERP devices achieve their expected throughput enhancement over Non-ERP devices in the mixed network.
YES: 22 NO: 17
- x. Motion: Require that protection mechanisms are required whenever any NonERP STA associates to the BSS.
 1. Moved by Steve Halford; seconded by Duncan Kitchen
 2. Terry Cole: Clarifies whether Steve means that when an 11b device associates to an 11g network, it may not cause a significant impact if it is primarily quiet but it can have a significant impact on the 11g if it does become active. Steve confirms.
 3. Motion carries 33/8/4
 4. Steve to capture this motion into comments 21 and 28.

Group does not wish to mandate that protection mechanisms are mandatory in the case of an overlapping BSS. No further discussion, resolution for comment 21 and 28 accepted by unanimous consent.

Steve Palm claims that the commenter's resolution for comment 27 cannot be implemented in a dynamic environment. Fred Stivers disagrees and states that it is a simple table lookup. Marcus believes that this mandates a rate adaptation algorithm. Dick mentioned that no one is precluded from doing what the commenter proposed but that it should not be mandatory. Chair asks if anyone disagrees with rejecting comment 27. No one comes forth. Rejecting comment 27 accepted by unanimous consent.

- c. Appendix tab, Comment 9 (on protection mechanisms): Countered stating that a requirement has been added to set the Use_Protection bit when a nonERP station associates. The SDL has been updated to define the proper use of RTS/CTS and CTS only as protection mechanisms. Further use of protection mechanisms is left to the implementer to use as necessary to enable a robust link, thus the text of Annex E is left informative. No objections. Accepted by unanimous consent.
3. Row 32: Comment identical to row 20. Steve Halford proposes that we use the same resolution as adopted for row 20. No discussion. Accepted by unanimous consent.

4. Row 49: Chip phase initialisation for 33 Mbps PBCC. Joe Mueller commented that requiring the phase to be based on the last chip of the CRC such that the phases for both 22 and 33 Mbps PBCC are derived from the same reference would simplify implementation. Comment rejection accepted by unanimous consent.
5. Row 53 and 54: Joe Mueller indicated that the figure does not align with the text and in fact the b2j-1 should be changed to 2bj+1 in the figure. Accepted by unanimous consent for both Rows 53 and 54.
6. The session adjourned at 3:00pm.

Wednesday Mar 12, 2003

Session 8: 3:30-5:30PM

1. Continue Clause 19 comment resolution:
 - a. Rows 59, 60, 61 all deal with CCA. Steve has proposed we clean up Mode 5 before we decide on removing Mode 1. Carl states that ED is fast but inaccurate where as CD is slow – he reiterates that the text implies AND but that perhaps it should be OR. Carl states that OR makes sense in that you can get a quick indication with an ED. Steve states that ED really depends on the threshold and that perhaps it should be any combination of ED and CS. Carl is suggesting using AND but in the case where a CS is detected and ED is below the threshold, it is a moot point because the receiver is active. Geert asks if it is mandatory that you do not transmit and receive simultaneously – Geert feels that it can't be AND and maybe not OR but some other combination. Carl notes that the standard does say that if a correct PLCP header is received, that CCA shall indicate a busy packet until end of the packet. Fred Stivers recommends adding Mode 4 and making Mode 5 an AND. Chair asked if there was any objection to making it “a combination” of CS and ED. No objection, adopted by unanimous consent.

Chair asks for a straw poll on all those in favor of removing CCA mode 1.

In favor: 8, opposed 3.

Chair asks “Is there anyone opposed to eliminating CCA mode one?” Comment made that neither Mode 1 nor 5 are robust so why remove Mode 1? Motion from Fred Stivers to remove CCA Mode 1 (Marcus seconded). Motion fails 8/4/8.

Joe Mueller states that Mode 1 is a subset of Mode 5 and that forcing others to use CS is a good for the network. Steve notes that the CS is for the most part already mandated in other parts of the standard. Terry Cole proposes to reconsider motion. There was not unanimous consent to reconsider the motion.

Fred Stivers makes the motion to reconsider the motion. No debate.

Motion to reconsider passes 21/0/6

Motion to reconsider is: “Move to eliminate CCA Mode 1 from the 802.11g draft.” Fred Stivers states that with the “a combination” verbiage in Mode 5 that Mode 1 does not add anything. Concern raised that people may not know how to interpret “a combination”. Steve reiterates that CCA mode 1 does not eliminate any complexity. Geert is concerned that it may generate more NO votes. Move to eliminate CCA Mode 1 from the 802.11g draft.

Motion passes 22/3/5

Group accepted to remove Mode 1 resolving comment 60 and 61. The editor has been instructed to update the MIB, PCs, etc in the draft.

2. All rows marked as “unanimous consent” as indicated in column N have proposed resolutions that have received unanimous consent within the ad-hoc committee. The intent of the chair is to accept the resolutions as a single block rather than individually.
 - a. Chair asked if there are any comments marked for unanimous consent in column N of the Appendix tab that should be discussed in the group and not accepted in bulk.
 - b. Carl requests that 86 and 87 be discussed.
 - c. Steve realized that we did not address comments 85, 86 and 87 that were not marked for unanimous consent in column N.

3. Continue Clause 19 comment resolution:
 - a. Row 85: 'peer-to-peer' vs. 'sublayer-to-sublayer' nomenclature question. Matt Fischer and Terry Cole verified that the commenter is correct and that 'sublayer-to-sublayer' is correct. Unanimous consent to accept comment.
 - b. Row 86: Carl state that the Ad-hocs resolution is not sufficient given that the reference given by the Ad-hoc does not address the concern. Carl requests that we adopt the commenter's resolution. Comment raised that there is a monotonically increasing requirement that the ad-hoc was attempting to capture with the reference. A modified resolution was made stating: "The editor should add the statement that "The mapping for RSSI values to actual received power is implementation dependent provided the mapping meets the requirements of 17.5.5.7 and 18.4.5.11". Comment made that there is no more information in the references than what is already in the section. Steve believes that it is not necessary that the mappings be monotonic. Chair asks if there is any objection to simply stating that it is implementation dependent. Accepted by unanimous consent. Similar resolution and consent for 87.
4. Again, the Chair asks if there are any comments that need to be removed from the unanimous consent column. Concern raised with comment 29 – PSD masks. Steve clarified proposed resolution. No further comments removed from unanimous consent column. No objection to adopting all those resolutions marked "unanimous consent". Accepted by unanimous consent.
5. All comments in Clause 19 tab resolved.
6. Group to address the comments resolutions under the MAC tab of document 11-03-219r5-G-TGg_SB_1_Comment_Resolution.xls
 - a. Row 11: Rejected as the deleted sentence appears in 9.6, so the applicable language still exists in the standard – no change necessary. Dick proposed changing it from a reject to a counter. No comments – accepted by unanimous consent.
 - b. Row 12: Proposed resolution adopted by unanimous consent (no discussion).
 - c. Row 14: No discussion on proposed resolution to reject comment. Adopted by unanimous consent.
 - d. Row 15: Same comment as Row 14 but different resolution. No objections to the proposed resolution. Adopted by unanimous consent.
 - e. Row 16: No discussion/objections to the proposed resolution. Adopted by unanimous consent.
 - f. Row 23: Request to move this to the editorial comment section.
 - g. Row 29: Is the same issue and resolved as in 23. Both 23/29 approved by unanimous consent.
 - h. Row 39: The reject comment does not reflect the consensus of the ad-hoc group. Fred Stivers commented that when in a BSS there is no way for the AP to indicate to the STA's that a long-preamble STA is associated. Matt Fischer states that if a long-only device is allowed to join the BSS the BSS can disable the short preamble – 11g states that all STA must dynamically monitor the short preamble allowed bit. This is not in 11b so the only way to handle this case is to disassociate all STA and reassociate with the short preamble bit indicating that it is disabled. Chair proposes that we postpone this until tomorrow.
7. The session adjourned at 5:30pm.

Thursday Mar 13, 2003
Session 9: 8:00-10:00AM

1. Chair announces that draft 6.7 is available on Pluto.

2. Continuing MAC comment resolution:

- a. Row 39 (discussion continued): Matt Fischer noted that the short preamble bit may be used but make it dynamic for 11g STA only thus not making existing Clause 15, 18 devices non-compliant. Fred Stiver notes that this could cause STA that do not dynamically monitor this bit, they may be locked into long slot time. Chair notes that there is another comment relating to this topic: Row 59. Matt Fischer notes that this solution does not solve the whole problem because it does not limit 11b systems from using 5.5 and 11 Mbps, which may not be decodeable. Comment from floor is that the protection mechanism frames must be sent at the BSS basic rate set. Matt Fischer pointed out that it is not required to pick a rate from the basic rate set for PM frames. Mike is opposed because the resolution only applies to protection mechanisms and not all frames sent with Barker preamble. Carl asked whether 11b solved this problem? Carl suggests putting in a bit that controls what preamble is used. Chair asks if anyone is opposed to adding a bit to the ERP Information element to mandate use of long preamble – Mike is, but would like to see straw poll results.

Straw Poll: Shall we use the existing Short Preamble bit in the capability field to control use of long and short preambles? YES: 9 NO: 16

Matt Fischer proposes the following resolution to comment rows 39 and 59: “The editor shall add b2 to the ERP Information element. Define b2 as Barker_Preamble_Mode.” Include the following normative text within 7.3.2.13 to describe the use of the new bit: “When there are no Non-ERP devices associated with the AP, Barker_Preamble_Mode shall be set to 0. Barker_Preamble_Mode shall be set to 1 by the beacon sender if one or more associated Non-ERP devices are not short preamble capable, as indicated in their capability information field. Otherwise, Barker_Preamble_Mode shall be set to 0 by the beacon sender. If Barker_Preamble_Mode is set to 1, all clause 15 and clause 18 frames shall be set with long preambles. If Barker_Preamble_mode is set to 0 by the AP, clause 15 and clause 18 may be sent with either short or long preambles.” Terry Cole states that this should only apply to protection mechanism frames.

Chair asks if there is unanimous consent for adopting the above resolution for comment rows 39 and 59. No more discussion – approved by unanimous consent.

- b. Row 52: Matt Fischer notes that ER-PBCC includes a rate not included in PBCC. Chair asks if any one is opposed to resolution proposed by ad-hoc committee – none. Resolution approved by unanimous consent.
 - c. Row 58: Resolve as a counter – see resolution for comment row 21 of the clause 19 tab. Hearing no objection, approved by unanimous consent.
 - d. Row 64: There is no objection to rejecting the comment. Recommendation of ad-hoc committee approved by unanimous consent.
 - e. Row 68: Ad-hoc group recommends we reject the comment. No opposition to proposed resolution. Approved by unanimous consent.
 - f. Row 62: Supported rates element. Modify resolution to comment from accept to counter. No objection – adopted by unanimous consent.
 - g. Row 5: Changed to editorial and rejected (also applied to 6, 7, 8). Adopted by unanimous consent.
3. Chair asks if there is any objection to adopting by unanimous consent all the comments marked “unanimous consent” in column N of the MAC tab
- a. Adopted by unanimous consent.
 - b. All comments in MAC tab resolved.
4. Group to address the comments resolutions under the editorial tab of document 11-03-219r5-G-TGg_SB_1_Comment_Resolution.xls
- a. Row 73: Rejected.
 - b. Row 82: A definition of basic rate will be added.

5. The session adjourned at 9:55am.

Thursday Mar 13, 2003

Session 10: 10:30-12:00PM

1. Chair proposes Motion 1: Move to direct the 802.11g editor to update the draft to version 7.0 based on and including all resolutions adopted during the March 2003 session. The draft shall be placed on the server by 7:30pm CST on Thursday, March 13, 2003.
 - a. Moved by Mike Paljug; seconded by Matt Fischer
 - b. Motion carries 23/0/1.
2. Chair proposes Motion 2: Move to forward Draft 7.0 of 802.11g to a 15-day Sponsor Recirculation ballot such that the sponsor Recirculation closes by Apr 10, 2003.
 - a. Moved by Jan Bohr; seconded by Terry Cole
 - b. Motion carries 24/0/0.
3. Chair proposes Motion 3: Based on the results of the Sponsor Recirculation ballot on Draft 7.0 of 802.11g, move to enable TGg to resolve comments, update the draft and/or forward the resulting draft to Sponsor Recirculation ballot at its April 2003 ad-hoc meeting.
 - a. Moved by John Terry; seconded by Mick Paljug
 - b. Motion carries 25/0/0.
4. Chair proposes Motion 4: Move to enable TGg to resolve Sponsor Ballot comments, update the draft and/or forward the resulting draft to Sponsor Recirculation ballot at the May 2003 session.
 - a. Moved by Matt Fischer; seconded by Jan Bohr
 - b. Motion carries 25/0/0.
5. Chair calls for new business.
 - a. Steve Palm: At the January meeting, ANA requested a list of element ID's that needed to be reserved. At the time, ID47 was overlooked and thus not requested to be reserved.
Motion: Move to request that the ANA reserve information element ID 47 as Broadcom Proprietary.
 - i. Moved by Steve Palm; seconded by Mike Paljug
 - ii. Motion carries 18/0/6
 - b. No more new business.
6. TGg adjourns at 11:00am for the week.

**IEEE P802.11
Wireless LANs**

Meeting Minutes for 802.11h March, 2003

Date: March 10, 2003

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Monday, March 10, 3:30PM session

Peter Ecclesine appointed Secretary for the January Interim
Mika Kasslin presented IEEE 802.11-03/004r1 TGH Agenda, Reviewed the agenda to pick which timeslots to give back.

Keep Tuesday 10:30AM, Monday and Tuesday evening, Tuesday 8am given up, keeping Tuesday afternoon, and Wednesday afternoon.

Andrew Myles moved, Chris Hansen seconded Moved to approve the modified agenda 03/xxxxr1
Approved unanimously

Review and approve 03/040 January Minutes
Mover Peter Ecclesine, Seconded Chris Hansen
Approved unanimously, 23 people in the room

Presentation by Andy Gowans on the EN 301 893 Harmonised Standard. Expect BRAN 32.5 in April to process comments

EN Annex D DFS parameters
Channel Availability Check 60s 'continuous checking' in probabilistic terms
Channel Move Time 10s
Channel Closing Transmission Time 220/260 ms ? still in discussion [the key item being measured]

99.99% probability of detection

Question about radar bandwidth of their signal – look in HS and ITU-R 8A documents

Examples of slave devices and radar detection thresholds:

Maximum transmit power
Example 1:
Slave device tx

- 200mW, -64 dBm
- <= 200mW, N/a

Example 2:
TX > 200 mW, -62 dBm
121-200mW, -55 dBm
< 120 mW, N/a

Example 3:

- TX >500mW, -62 dBm
- 201-500 mW, -62 dBm
- 101-200 mW, -55 dBm
- 51-100 mW, -52 dBm
- < 50 mW, n/a

Ad hoc networking threshold:

- 200mW, -64dBm
- 26-200 mW, -62 dBm
- < 25 mW, n/a [same in 5.8 GHz band]
- Radar detection is not mandated in 5150-5250

HS will have startup test

Editor reviewed 03/040r3

Adjourned at 5:30pm

Tuesday, March 10, 10:30PM session

Chair Comments:

Draft will be available online sometime in mid-April with a schedule consistent with a new 15 day sponsor re-circ ballot. More details later this week.

Resolutions:

Simon Black to take the MIB issues. Not present.

Andrew Myles summary of new resolutions (See 03-137r2):

1. Comments 2 and 3. New information from ETSI are now available. TGH will track.
2. Comment 21 and 22. No changes for now.
3. No MIB changes until new information from Simon Black.
4. Comment 30.
5. New EIRP definition added.

New draft will be released to the reflector when ready for review.

Mika presents the current ETSI harmonized standard. He will put it up on the server shortly.

Informal Discussion

Al Garret brings up the issue of false alarm requirements. Nothing planned in TGH or ETSI.

Adjourned until 1:00pm tomorrow.

Wednesday, March 10, 1:00PM session

Begin at 1:04pm

Mika reviewed proposed schedule contained in 03/237r0, with a Sponsor Ballot recirc start

Now into comment resolutions about the MIB and PMLE on Transmit Power

Comment resolution file to become 03/137r3

Move to adopt resolutions in 03/137r3

Moved Andrew Myles, Second Leo Monteban

Yes 11, No 0, Abstain 0

Wednesday, April 9, 1 pm PDT Ad hoc call

Adjourned at 1:40pm

**IEEE P802.11
Wireless LANs**

**TGi Dallas Plenary Meeting Minutes
March 2003**

Date: March 10-14, 2003

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Abstract

Minutes of the 802.11 Task Group I meetings held during the 802.11 WLAN Working Group Plenary Session in Dallas, Texas from March 10th – 14th, 2003.

Monday, March 10, 2003

3:45pm

Call to Order & Agreement on Agenda

Meeting called to order on Monday, March 10, 2003 3:45pm by Chair Dave Halasz.

Chair: Agenda discussion

Proposed Agenda:

- o Approve Agenda
- o Chair's Status
 - o TGi Draft 3.1 LB52
 - o Seattle Ad-Hoc
- o Review IP Policy
- o Comment resolution of LB52 (draft 3.0 of TGi)
 - o Request Submission presentations to address specific comments
 - o Comment resolution
 - o General Submissions
- o Letter to the IETF
- o Prepare for next meeting.

TGe Chair John Fakatselis and TGi Chair Dave Halasz will discuss if a joint TGi/TGe meeting is necessary during this WG Session. Any decision to hold a joint meeting will be announce at the Wednesday mid-session plenary.

Chair: Are there any changes to the agenda?

None

Chair: Any objections to accepting the agenda?

None

Chair's Status

Chair: Letter Ballot 52 passed (76%). There were more than 2000 comments so we can't go to Sponsor Ballot. We have been working on these, and will continue to do so at this meeting.

Chair: In the Seattle ad-hoc, we worked on TKIP countermeasures. We also discussed MPDU/MSDU with CCMP. We had an 802.1 EAP state diagram discussion. We are still searching for a time that we can meet with 802.1. Possibly Wed evening. I will announce the meeting time at the Wednesday mid plenary.

Dorothy: The EAP WG asked us for further input on two areas- EAP methods and key strength.

Chair: We have created five sub-groups to work on Letter Ballot comments. Are there any Submissions from these sub-groups?

Submissions for comment resolution

Mike Moreton 03/072r3 – TSN Definitions
Jesse Walker 03/xxx – PRF
03/169r0 General Comment Resolutions – Mike Moreton
03/170r0 Removing the TGe dependency – Mike Moreton
03/175 DLP Security – Dave Halasz
03/160 Key Handshake, Timing & PMK Hashing - Tim Moore
03/xxx Clause 5 Comment Resolution – Dorothy Stanley
03/xxx Clause 8.5 Comment Resolution – Nancy Cam-Winget
03/xxx Comment Resolution Nancy Cam-Winget
03/118r3 Clause 8.3.4 Comment Resolution – Paul Lambert
03/xxx Clause 2, 3, 4, 7 Comment Resolution – Frank Ciotti
03/xxx Clause 8.3 Comment Resolution – Tim Moore

ch: Are there any general submission?

General Submissions

03/181 Need for MIC countermeasures tutorial – Clint Chaplin
03/xxx Letter to IETF – Jesse Walker
03/xxx 802.1/802.11 Joint issues – Jesse Walker
03/173 Coexistence of RSN & pre-RSN
02/684r3 Extended Key IV (doc 03/686) – Marty Lefkowitz
03/152r0 Michael Countermeasures state machine – Mike Moreton
03/168r0 Encrypting management frames – Mike Moreton
03/xxx Countermeasures – Dan Harkins

Review IP Policy

Chair read two bullet items.

Chair showed the two slides requested by WG chair “IEEE SA Standards Board Bylaws on Patents in Standards” and “Inappropriate Topics for IEEE WG Meetings”. Any objections are to be made to either the WG or TG chairs.

Chair: We will now proceed with Letter Ballot comment resolution submission.

Submissions for comment resolution

Submission: Mike Moreton – doc 03/xxx Security Network Definition

Mike: I’ve defined RSN distinct from TSN.

Mike: Almost everywhere in doc where RSN is used, it will need to change to RSNA.

Chair: We put TSN in the draft to allow WEP stations, but we discourage WEP. With the directions that vendors are taking, is a TSN still useful? What if we remove TSN and leave it to the vendors.

Mike: You would need to retain the ability to broadcast WEP as a broadcast key. You could remove the concept of a TSN.

Jesse: I'm against removing the TSN. We need to allow a mechanism for vendors to lift restriction to allow WEP, or vendors will revolt.

Comment: The submission would suggest that TSN and RSN are of equal importance.

Mike: I attempted to classify TSN, RSN and RSNA.

Comment: I'm confused on the difference of RSN and RSNA

Mike: An RSN is a BSS with an RSNIE that doesn't have WEP as a broadcast key.

Motion by Mike Moreton

Instruct the editor to incorporate the changes specified in doc 03/072r3 into the TGi draft.

Second: Jesse Walker

Discussion:

Mike: If you don't vote for, you will have to work out your own solution.

Vote: 26-2-10 passes

Submission: Mike Moreton – doc 03/170r0 Removing the TGe Dependency

Discussion:

Mike: I extracted the fields from TGe needed for TGi.

Mike: Changes are required to the TGe draft.

Mike: Add a traffic flow identifier

Comment: What happens if the STA really is a QoS STA, how do they operate together?

Mike: In terms of replay counters, we look at our fields.

Comment: If it were not for CFP, you wouldn't have to invent this.

Mike: Not really.

Comment: So the intent is to create a 4-bit field in both TGi and TGe, without having a cross-reference?

Comment: There are other mechanisms to solve the proposed problem. We already handle this in the CCMP section with a section we could pull out and hand to TGe. There were no LB comments on solving for Contention Free.

Mike: Yes there were – I made them.

Comment: Why add more complexity to things that already work?

Mike: Because it doesn't work – we don't have a solution for Contention Free.

Submission – Tim Moore doc 03/160r0 Roaming timings and PMK lifetime

Discussion:

Comment: How much data were you moving?

Tim: 400-500 byte packets.

Comment: If you were running the same experiment at the meetings here (with the high volume of traffic), it wouldn't work as well.

Jesse: Given the variations, how many measurements were made?

Comment: Did you force the STA to stay at 11Mbit?

Tim: Yes

Comment: Were the APs 802.11a/b/g chips?

Tim: Yes, but forced to 802.11b.

Tim: The AP with the fastest processor had the slowest throughput, and vice-versa.

Comment: Are these the delta times?

Tim: They are timings between packets.

Comment: Based on AiroPeek timings?

Tim: Yes.

Comment: My experience is that the AiroPeek timings are suspect.

Comment: The total times are not channel times, but elapsed times?

Tim: Yes.

Comment: So it does include the latency and ACKs?

Tim: Yes

Comment: If you had a QoS AP, these times would have been better.

Tim: Yes.

Tim: It was interesting to see that the APs were faster than the STAs. However, the STAs had a much faster processor.

Comment: These times can't be right. The preamble alone is 40us. Then you have to include the ACK.

Tim: I didn't include the ACK times.

Comment: Were these unicast or broadcast?

Tim: Unicast.

Comment: How many STAs doing 4-way at one time?

Tim: Only one.

Comment: If 2-way, it ought to run twice as fast.

Comment: Your analysis doesn't include the EAP method. This is for PSK.

Tim: True.

Jesse: There are 15 exchanges minimum.

Jesse: What we have now for pre-auth is inadequate. We are not using EAP for pre-auth.

Tim: For pre-auth, it does not say to start 802.1X

Jesse: The Open Authentication request/response is completely gratuitous. It is only there because vendors do not want to change their state machine.

Chair: We are out of time. We will resume this discussion on Tuesday.

Chair: A reminder that there is a LinkSec tutorial this evening.

Any objection to recess until tomorrow?

None

Recessed until Tuesday

Tuesday, March 11, 2003

Resume 1:00pm

Chair: There are some fast roaming presentations that people would like to make.

Chair: I talked w/Tony Jeffries about having a joint 802.1 mtg. He said to show up at the 1:30pm 802.1 meeting tomorrow.

Submission (continued)– Tim Moore doc 03/160r1 Roaming timings and PMK lifetime

Comment: Is there a timeout?

Tim: Yes, I will talk about that later.

Comment: Is the PMK global or per STA?

Tim: Per STA.

Comment: I don't believe the last bullet on "Use of PMK Cache" is correct.

Comment: What Bernard and Bill Arbaugh drafted may work as a way of flushing PMKs

Comment: What is the status on the IETF RADIUS draft referenced in your slides?

Comment: It is bouncing around in the IETF.

Chair: Is this basically a follow-up to Bill Arbaugh's presentation

Tim: Yes

Chair: Bill's presentation is document 03/0??.

Tim: An IRTF is being formed to study this.

Comment: I am still working on the charter.

Comment: There are two parts to the problem – the front end and back end. IEEE can do one, and the IETF can do the other.

Tim: There are two Word docs associated with this presentation that go into more detail. One has not dependencies on the IETF, the other does.

Jesse: Regarding the PMK - this is our hierarchy, so it up to us to name it.

Comment: I'm not sure we all agree what key you are talking about. Until the rest of this is fleshed out, we can't say.

Tim: The PMK that I am looking at is the one at the top of the key hierarchy.

Comment: How many are there per AP?

Tim: One per STA-AP pair.

Comment: Bill stated that there was a way to do this without having multiple PMKs.

Comment: You no longer have to worry about synchronization if you have a unique PMK for each STA-AP pair.

Tim: The PMK may not be unique per AP-STA pair, why should you care?

Comment: You certainly do care.

Tim: But you have the 4-way handshake.

Chair: Note: after dinner, we meet in Enterprise 1-2

Chair: We have Nancy's presentation next. Are there any other fast roaming presentations?

None.

Submission: Nancy Cam-Winget – doc 03/202r0 Keying for Fast Roaming

Comment: This is the same identifier used by the RADIUS servers for Accounting.

Comment: Does the ETEK exist today?

Nancy: This is new

Comment: How is it derived?

Nancy: A new IETF draft by Mark Grayson and Joseph Salowey.

Comment: Where does the Master Key come from?

Nancy: The result of EAP

Comment: Why is the PTK derivation different from the current method?

Nancy: To allow roaming

Comment: Is the proposal to replace the current PMK derivation method?

Nancy: No, an optional alternative.

Comment: Where is the PMK derived?

Nancy: At the Authentication Server.

Comment: Upon returning to a previous AP, does the PMK need to be fresh?

Nancy: No, the PTK.

Jesse: We are using counter mode to produce the PTKs.

Comment: So, the counter replaces the nonce essentially?

Jesse: Yes.

Comment: If a counter values were to be re-used, that is when you would need a fresh key?

Nancy: Yes

Nancy: The AS will need to generate the MKID in addition to the PMK and deliver to the STA based on the EAP method.

Comment: Is the MKID used today at the STA?

Nancy: No, not at the STA. It is used on the AP for accounting.

Comment: The arguments to the PRF don't match between slides 6 & 7.

Nancy: I'm missing the length on the end. I will fix that.

Comment: Is the first association the same as it is today?

Nancy: It is different – I'll show that later.

Comment: Is the RSN IE MIC'd?

Nancy: Yes

Comment: If the Re-assoc on slide 7 fails, what happens?

Nancy: Go back to full Association.

Jesse: The RSN IE in the Confirm needs to be MIC'd on slide 10

Comment: I thought 802.1X didn't want to deal with the key hierarchy?

Nancy: 802.1X only sends the temporal keys to 802.11, so it knows the two keys needed.

Comment: Can you explain what you mean by back-end store?

Jesse: When there are many users roaming, the caches can become quite large. The idea is that the AP can store this state on a server.

Comment: But then you incur a roundtrip for every authentication.

Jesse: Yes, but caching will improve performance.

Comment: The number of keys depends on the subscriber base, not the amount of traffic.

Jesse: True.

Nancy: The MKIDE is the MKID MIC'd with the ETEK.

Comment: If this were to be placed in the draft as optional, who would continue to use the old scheme?

Jesse: There are legacy reasons to have the current scheme (e.g. WPA).

Jesse: Group key delivery is still needed as well for updates.

Comment: How is the group key delivered in the new scheme?

Nancy: It is in the (slide 19) msg to STA.

Comment: Where do you derive the end-to-end key?

Nancy: I need to define that. There is a new RFC that defines how to do this.

Comment: Is there any interaction with anything going on in TGe?

Nancy: I don't think the fast roaming does anything with the Re-assoc msgs.

Comment: What we are doing is orthogonal to this.

Comment: There is a fundamental change in where the key is exchanged. Currently it is in EAP, here it is in management frames. I would like to keep as much as we can in the EAPOL framework.

Nancy: The reason we put them in 802.11 is because we wanted them to be out of band. Those IEs are being sent to the 802.1x layer.

Comment: What are the savings when Re-associating?

Nancy: The measurements we observed for the current TGi draft were 40-60ms w/o EAP. With this implementation, 6-15ms.

Comment: Between which frames?

Nancy: From Open Auth, excluding EAP.

Comment: You accomplish 2 things; derive the PTK and a new scheme to eliminate 4 way to 2 way. Can these be decoupled and used in the current draft?

Nancy: Not really.

Comment: What you've invented is a fast way to derive new keys. Can this scheme be applied to DLP to allow two unrelated STAs to obtain keys?

Comment: No, it is not a shared secret.

Recess until 3:30pm

Resume 3:40pm

Chair: Summary of where we are.

Chair: We are working towards re-circulation ballot. We are not quite ready to go to re-circulation. It will probably be May.

Chair: Resume with discussion on Nancy's presentation.

Comment: The nice thing about this scheme is that it takes some of the messages out of the data stream.

Comment: What are the 7.5 round trips?

Jesse: It's 6.5.

Comment: I thought we needed the 4-way to securely exchange keys?

Chair: There is more than one way to do things.

Jesse: We pushed the request for freshness up. The 4-way did not make that assumption so it guaranteed that the temporal key is always fresh.

Comment: So how does this affect PSK?

Comment: You must make sure that the PMK is fresh.

Comment: The two things the 4way was providing (proof of knowledge and both STA and AP contributing to the PTK) are also provided in this scheme.

Comment: Do you know how much entropy is needed for this scheme?

Jesse: We haven't determined that yet.

Chair: Are there any other presentations on fast roaming?

Comment: I would like to see a comparison on the 3 options we've seen today. They all have advantages, but I would like to see the trade offs.

Comment: What are the three?

Comment: Cached PMK, Key ID, and this last one.

Nancy: There was some overlap between Tim's proposals and this one.

Comment: They all assume the PMK is pushed to the AP.

Nancy: And they all assume a cached PMK.

Comment: Maybe we want to do a combination. We are going to be asked to make a decision.

Comment: There is a lot of commonality. They need to use common terminology.

Chair: People are getting ready for motions.

Comment: We don't have enough information to make a valid decision.

Comment: It would be better to do the work up front than to debate at the time the motions are made.

Comment: So then we should vote "No" if we don't have enough information?

Chair: Yes.

Comment: We could state that we will do this motion at some specific time later in the week.

Chair: Yes a motion could be made to postpone.

Motion by Dorothy Stanley

Move to postpone discussions and motions on Fast Roaming until Thursday at 10:30am.

Second: John Kowalski

Vote: 44-10-6 Passes

Submission Jesse Walker – doc 03/048

Comment: On slide 6, is it better to have the counter at the end of the list?

Jesse: If it did, then the hash would be broken.

Comment: The loop variable should be “counter”, not “i”

Jesse: Correct.

Comment: Was CBC-MAC approved by NIST?

Jesse: It was approved as a hash function

Comment: Is there any cryptographic advantage to using 512 instead of 256?

Jesse: There will be more output bits.

Comment: The min/max were included when we were not sure what we were going to do with IBSS.

Jesse: Correct.

Comment: Is there a straw poll option to leave things as-is?

Jesse: If we leave things alone, then we will need to petition NIST to make HMAC SHA1 compliant.

Comment: Do we vote for only one?

Jesse: No. If all are well accepted, I'll pick my favorite.

Comment: Are you concerned about the security of SHA1?

Jesse: No. Russ? No

Comment: What is the entropy of SHA1?

Jesse: $\text{Min}(n/2, 80)$

Straw Poll

Replace 802.11 PRF with NIST PRF with

- $ID_1 = \text{Authenticator-MAC-Addr}$
- $ID_2 = \text{Supplicant-MAC-Addr}$
- $\text{OptionalData} = \text{ANonce|SNonce|keysize}$
- $H = \text{SHA-1}$

Result: 9-11-33

Same question with $H=\text{SHA-256}$ instead

Result: 11-17-24

Same question with $H=\text{AES-CBC-MAC}$ with feedback to NIST.

Result: 21-3-27

Jesse: On the basis of straw poll, I will prepare text for a motion on Thursday for AES-CBC-MAC.

Comment: How does this affect password mapping?

Jesse: NIST doesn't state anything about this. We're safe because if anyone puts in a password, we don't have to worry about the entropy being reduced.

Motion: Nancy Cam-Winget – doc 03/205r0 Motion to address comment 1488

Change the following in Clause 8.5.1:

From:

- “extract bits F through F+L bits”

To:

- “extract bits F through F+L-1 bits”

Second: Tom Maufer

Discussion:

None

Vote: 46-0-3 Passes

Motion: Nancy Cam-Winget (comment 1394)

Comment: There are no countermeasures for CCM, so why indicate it? The AP will do nothing about it.

Update clause 7.3.1.4:

- Modify reason code 14 description from “MIC Failure” to “Michael MIC failure”

Second: David Johnston

Discussion:

<none>

Vote: 46-0-3 Passes

Motion by Nancy Cam-Winget (comments 34, 37, 38, 1562)

Instruct the editor to replace Clause 8.3.2.4.2 and add the appropriate clauses for the MLME interfaces with text provided in Document 03/156r1

Second: Jesse Walker

Discussion:

Comment: For – This addresses 3 of my comments.

Comment: I don't like the secure bit.

Motion to amend by Tim Moore

Instruct the editor to replace Clause 8.3.2.4.2 and add the appropriate clauses for the MLME interfaces with text provided in Document 03/156r1 with mention of the Secure bit removed.

Second: Clint Chaplin

Discussion:

Comment: Why should this not be set?

Jesse: Text in the draft implies that the bit should be set to zero at that point.

Nancy: The text should be updated to reflect that.

Comment: How is this bit used?

Comment: The Supplicant uses it to know it has all the keys.

Comment: The bit should transition to zero if there is a TKIP integrity error.

Comment: Could you simply use the completion of the group key handshake instead?

Vote: 19-1-24 Passes

New Main motion

Instruct the editor to replace Clause 8.3.2.4.2 and add the appropriate clauses for the MLME interfaces with text provided in Document 03/156r1 with mention of the Secure bit removed.

Vote: 34-1-7 Passes

Motion by Nancy Cam-Winget:

In Clause 8.5.2 in 2nd paragraph of Key Data description, change:

From:

“an AP shall insert this second RSN IE only to indicate the pairwise key cipher suite the STA must use when the STA selects an enabled pairwise key cipher suite that policy disallows this particular STA”

To:

“an AP shall insert this second RSN IE only to indicate the pairwise or group key cipher suite the STA must use when the STA selects an enabled pairwise or group key cipher suite that policy disallows for this particular STA”

Change Key Data description in Clause 8.5.3.3

From:

“the AP's Beacon/Probe RSN IE, and, optionally, a second RSN IE that is the Authenticator's unicast cipher suite assignment.”

To:

“the AP's Beacon/Probe RSN IE, and, optionally, a second RSN IE that is the Authenticator's unicast and group cipher suite assignment”

Second: Jesse Walker

Discussion:

Comment: Why did the AP advertise the option in the first place if its not going to allow it?

Chair: Once the STA is fully authenticated via AS, the environment for STA may be different.

Comment: The beacon only provides info for that SSID.

Jesse: This may be an incomplete motion unless we explain how we can have two groups keys active at the same time.

Nancy: The AP can support multiple SSID's.

Jesse: Then they have different BSSIDs, or we expand the KeyId space.

Comment: We need better analysis before voting on this. What if the STA cannot perform this new mode?

Nancy: So I should revise the presentation I made in Ft. Lauderdale?

Comment: Yes, revising is a good idea. If you want an AP to support multiple SSID, then it should support multiple BSSIDs and send out multiple Beacons. If you do that, this topic should not surface.

Motion by Nancy Cam-Winget

Move to table the motion on the floor.

Second: John Kowalski

Chair: Any objection?

None

Motion tabled.

Submission: Dan Harkins – doc 03/211r0 – Attacks Against Michael and Their Countermeasures

Discussion:

Jesse: This is encouraging work. We should have been discussing this from the beginning. Have you communicated with Niels?

Dan: 2²⁰ was a design goal. He mentioned that there was a flaw in my analysis that was leading down the wrong path, but he did not give details.

Jesse: If your number is closer than Niels', then your recommendation is good.

Comment: There was a discussion that every time you re-key, you leak some info on the key hierarchy.

Jesse: I don't remember that discussion.

Jesse: There are approx 2¹⁹ minutes/year. If we limit the number of attacks to 2/min, then we limit the possibility for success to 1/year.

Chair: I'll ask if we want to continue this discussion after dinner.

Recess until 7:00pm

Resume 7:10pm

Chair: Resume of Dan's presentation.

Comment: If there is anything that can be done that can cut down on the attack rate without changing the protocol, that would be good.

Dan: It is not the rate, but rather the time it takes to break Michael. The design goal is one year.

Comment: We are trying to limit DoS attacks by sending the EAPOL-Key message instead of a Disassociate.

Comment: Can this be solved by making the countermeasure time a MIB variable?

Comment: The concern is that if it is a variable, it will be set to the lowest value and never be touched again.

Dan: Nobody will be able to sell a product if 2 packets can shutdown the BSS for 60 seconds.

Comment: Based on what we did in Seattle, you no longer have the 2 packet countermeasure attack anymore.

Dan: What if the Authenticator received the MIC failures?

Comment: Then yes, that will invoke countermeasures. But this is not worse.

Comment: It is worse because there is no state.

Chair: When countermeasures are invoked, it does indicate that there is an attack on the system. The system Administrators would want to know.

Comment: There is a better chance of catching the attacker if you don't invoke countermeasures. He will continue to send packets.

Comment: There are many arbitrary variables here. We should quantify the risks.

Comment: A 26dBi antenna successfully Associated to an AP 10 miles away.

Chair: I would like to encourage people to perform follow-up work on this, as it seems important and necessary.

Motion by Dorothy Stanley - addresses comments 1728,1907,1967,2028, 2072, 1408, 331, 1392, 332,333,810,912, 1206, 1238, 1336,

Instruct the editor to replace Clause 5.4.3.1 with the following text.

5.4.3.1 Authentication

Change the first sentence of the fourth paragraph of clause "5.4.3.1 Authentication" from:

IEEE 802.11 provides link-level authentication between IEEE 802.11 STAs.

to:

IEEE 802.11 supports link-level authentication between IEEE 802.11 STAs.

Add the following paragraphs between the sixth and seventh paragraphs of clause "5.4.3.1 Authentication":

An RSN also supports authentication based on IEEE 802.1X, and using Pre-Shared Key (PSK)s. IEEE 802.1X authentication utilizes protocols above the MAC to authenticate STAs and the AS with one another. IEEE 802.1X requires use of EAP authentication algorithms. This standard does not specify a mandatory-to-implement EAP method. In an, RSN—that is, one deploying only RSN security mechanisms—802.11 Open System Authentication is required in an ESS. An RSN relies on the IEEE 802.1X framework, both to control MSDU flows and to carry the higher layer authentication protocols. In an RSN, the respective IEEE 802.1X Ports of both APs and STAs discard non-EAPOL MSDUs before the peer is known to have been authenticated. In this associated but unauthenticated state, the IEEE 802.1X Ports permit only the IEEE 802.1X authentication protocol to flow across the IEEE 802.11 association.

Since a STA may encounter multiple ESSs, it is necessary to provide a way for a STA to identify the security policy of each ESS, and to determine the authentication mechanisms each supports. If the ESS is an RSN, a STA can determine the authentication protocols in use through Beacons and Probe Responses. Furthermore, the RSN design provides a means by which a STA can indicate the authentication protocol it intends to use with the ESS. It should be noted that the choice of an acceptable authentication protocol is an issue for both APs and the STAs, since the goal of IEEE 802.1X Authentication is mutual authentication between the AS and the STA, not just authentication of the STA to an AP. A STA might choose not to associate with a particular ESS/AP for many reasons, among them being that the supported authentication mechanisms cannot achieve mutual authentication.

IEEE 802.1X authentication and PSK authentication are supported in an 802.11 IBSS, and described in detail in Clause 8.4.

Second: Clint Chaplin

Discussion:

None

Vote: 31-0-0 Passes

Motion by Dorothy Stanley

Instruct the editor to modify Clause 5.4.3.2 as follows:

5.4.3.2 Deauthentication

Change the text of the first paragraph in clause “5.4.3.2 Deauthentication” to:

The Deauthentication service is invoked whenever an existing Open System or Shared Key Authentication is to be terminated. Deauthentication is an SS.

Replace the following text as the second paragraph in clause 5.4.3.2:

In an ESS RSN, Open System Authentication is required for MAC layer authentication. In an ESS RSN, Deauthentication results in termination of any association for the deauthenticated station. It also results in the IEEE 802.1X controlled port for that STA being disabled. The Deauthentication notification is provided to IEEE 802.1X via the MAC sub layer.

In an IBSS RSN, Open System Authentication is optional. When open system authentication is used in an IBSS, deauthentication results in the IEEE 802.1X controlled port for that station being disabled.

Second: Clint Chaplin

Discussion:

None

Chair: any objection?

None

Motion Passes

Motion by Dorothy Stanley - addresses comments: 6, 337, 338, 2030, 1684, 2018, 339, 1544, 340, 1499, 341, 1461, 342, 1241, 343, 1240, 344, 1101

Instruct the editor to replace the text in Clause 5.4.3.3 with the following:

5.4.3.3 Privacy

Add the following paragraph between the fourth and fifth paragraphs of “5.4.3.3 Privacy”:

IEEE 802.11 provides three cryptographic protocols to protect data traffic: *WEP*, *TKIP*, and *CCMP*. *WEP* and *TKIP* are based on the RC4 algorithm, and *CCMP* is based on the Advanced Encryption Standard (AES). A means is provided for stations to select the algorithm to be used for a given association.

Add the following clauses after clause “5.4.3.3 Privacy” but before clause “5.5 Relationship among services”:

5.4.3.4 Key Management

Change the title of Clause 5.4.3.4 to “Key Management” “from Key Distribution”

The enhanced confidentiality, data authentication, and replay protection mechanisms require fresh cryptographic keys. IEEE 802.11 supports two key management mechanisms: manual key management and automatic key management. Automatic key distribution is available only in an RSN that uses IEEE 802.1X to provide key management services.

Second: Jesse Walker

Discussion:

Comment: Is the key lifetime part of 802.1X?

Dorothy: Yes and no

Chair: Any objection to the motion?

None

Motion Passes

Motion by Dorothy Stanley

Instruct the editor to replace the text in clause 5.4.3.5 with the following:

5.4.3.5 Data Origin Authenticity

Change the title of Clause 5.4.3.5 to “Data Origin Authenticity”

The data origin authenticity mechanism defines a means by which a STA that receives a data frame from another STA can determine that the MSDU actually originated from that STA. This feature is required in an RSN since one STA may masquerade as a different STA. This mechanism is available only to STAs using CCMP or TKIP.

Data origin authenticity is applicable only to unicast data frames.

Informative Note: All known algorithms to provide data origin authentication of multicast/broadcast rely on public key cryptography. Because of their computational cost, these methods are inappropriate for bulk data transfers.

Second: Clint Chaplin

Discussion:

None

Chair: any objection?

None

Motion Passes

Motion by Dorothy Stanley - addresses comments 346, 347, 1242

Instruct the editor to replace the text of section 5.4.3.6 with the following:

5.4.3.6 Replay Detection

The replay detection mechanism defines a means by which a STA that receives a data frame from another STA can detect whether or not the data frame is an unauthorized retransmission. This mechanism is available only to STAs using CCMP or TKIP.

Second: Dave Nelson

Discussion:

None

Chair: Any objection?

None

Motion Passes

Motion by Dorothy Stanley - addresses comments 220, 1102, 1368, 1362, 1685, 1368, 1730, 2031

Instruct the editor to replace the text in Clause 5.6 with the following:

Add the following paragraphs at the end of Clause “5.6 Differences between ESS and IBSS LANs”:

In an IBSS each STA must define and implement its own security policy, and each STA must trust the other STAs to implement and enforce a security policy compatible with its own. In an ESS the AP enforces the security model.

In an IBSS a STA must be prepared for other STAs to initiate communications. Each pair of STAs in an IBSS negotiates the security algorithms to be used. In an ESS the STA initiates all associations. In an ESS the STA and AP negotiate the security suite, and the AP enforces the security suite to be used.

In an RSN ESS, the AP may offload the authentication decision to an authentication server, while in an IBSS each STA must make its own authentication decision regarding each peer.

Second: Dave Nelson

Discussion:

None

Chair: Any objection?

None

Motion Passes

Motion by Dorothy Stanley - Addresses comments (5.9) 221, 1105, 1211, 1908. New 5.9.1 (Former 5.9.2): 357, 358, 359, 360, 361, 914, 1104, 1318, 1490, 1621, 1909, 1969, 2033. *Note that previous section 5.9.1 is removed.*

Instruct the editor to add the following clauses after Clause "5.8 Reference model", renumbering the Figures as appropriate.

An RSN relies on the IEEE 802.1X entity to provide authentication and key management services. Knowledge of the IEEE 802.1X 2001 standard is expected. The IEEE 802.1X access control mechanisms apply to the association between a STA and an AP, and the IBSS STA to STA peer relationship. The AP performs the Authenticator and, optionally the Authentication Server roles. A Non-AP STA can take on the Supplicant, Authenticator and Authentication Server roles.

5.9.1 IEEE 802.11 usage of IEEE 802.1X

IEEE 802.11 depends upon IEEE 802.1X to control the flow of MSDUs between the DS and unauthorized STAs by use of the controlled/uncontrolled port model outlined above. EAP authentication packets are transmitted in IEEE 802.11 MAC data frames, (rather than IEEE 802.11 management frames) and are passed via the IEEE 802.1X authenticator. Non-EAP authentication frames are passed (or blocked) via the controlled port. It is the responsibility of both the Supplicant and the Authenticator to implement port blocking. Each association between a pair of STAs creates a unique IEEE 802.1X "port," and authentication takes place relative to that port alone.

IEEE 802.11 depends upon IEEE 802.1X and the EAPOL-Key four-way and 2-way handshakes (described below) to establish and change its cryptographic keys. Keys are established after authentication has completed. Keys may change for a variety of reasons, including expiration of an 802.1X authentication timer, if a key has been compromised, or is in danger of being compromised, or to update the group-key.

Second: Clint Chaplin

Discussion:

None

Vote: 24-0-2 Passes

Motion by Dorothy Stanley - Resolves comments 10, 132, 179, 819, 927, 928, 1345, 1628

Instruct the editor to replace the existing Clause 5.9.4 with the following text:

5.9.4 Authenticator to Authentication Server Protocol

The Authenticator/Authentication Server authentication protocol is out of scope, but, to provide security assurances, the protocol must support the following functions:

1. Mutually authenticates the Authenticator and Authentication Server.
2. Provides a channel for the Supplicant/Authentication Server authentication.
3. Passes the generated key from the Authentication Server to the Authenticator for use by the Authenticator to communicate to the Supplicant.

Suitable Authentication Server protocols include, but are not limited to RADIUS and Diameter.

Discussion:

Comment: What does secure channel mean here? Is the AS local?

Dorothy: No

Comment: Then it is not possible to provide a secure channel.

Second: Dave Nelson

Chair: any objection?

None

Motion Passes

Dorothy: I will be making motions on Clause 5.9.3 later in the week. Please look at this Clause.

Submission: Dave Halasz – doc 03/175r0 DLP

Discussion:

Comment: The IBSS authentication for DLP is duplicating the ESS authentication. It would be nice to leverage the ESS authentication for the DLP.

Dave: The credentials are a larger issue than the authentication. You are also assuming that DLP will always grow from an ESS. This may not be the case. Using the IBSS for DLP allows authentication regardless of whether an ESS exists or not.

Comment: The people that want DLP are defining it for use only in a BSS. We don't need to worry about IBSS.

Dave: I would think a vendor would want the option of allowing DLP in both BSS and IBSS.

Comment: Your way de-couples the TG_i and TG_e drafts. However, our IBSS authentication is undesirable.

Dave: Then we should focus on IBSS authentication, not DLP authentication.

Jesse: As a group, we don't understand this mode of traffic and it makes moving forward difficult.

Comment: Based on your example, if you have an ad-hoc and add an AP, why then switch to DLP?

Comment: Only if they're sharing the channel.

Comment: Channel access rules apply to both BSS and IBSS.

Comment: The point of understanding how people are going to use this is applicable. For a projector, how do you enter the password?

Dave: As a projector manufacturer, I must support IBSS anyway.

Chair: Would you like to recess until tomorrow at 8:00am?

Comment: At 1:00pm we meet with 802.1 Should we meet in an ad-hoc fashion for tomorrow morning's session?

Chair: Let's meet first and then decide if we want to continue with ad-hoc.

Comment: Will there be another ad-hoc next month?

Chair: I was assuming yes.

Chair: Any objection to recess until 8:00am tomorrow?

None

Recessed at 9:10pm

Wednesday, March 12, 2003

Resume 8:10am

Chair: After the comment resolution submissions, if we have enough time we can break up into LB sub-groups.

Discussion: Paul Lambert – RSN IE Replay Counter Negotiation – Comment number 40

Paul: The comment was that the spec only applies replay counters to TKIP, and the commenter would like to them add them for CCMP as well.

Comment: The reason for that was because CCMP would be running on new hardware, and legacy hardware may not be able to support multiple queues.

Chair: Are we using the Queue Size in the RSN Capability field of the RSN IE?

Comment: Who put this in?

Comment: I put it in because originally it was 16, but I got a lot of push back.

Comment: I'm comfortable extending this to CCMP.

Paul: I'm not sure if it is necessary since TGe is mandating.

Comment: Do you really need 16 different counters per STA?

Comment: I believe the minimum you will need is four. You can control the number of queues beyond that as it is negotiated.

Comment: I suggest that we table this until after our TGe joint mtg.

Paul: Good idea.

Chair: If we have a joint meeting, would Paul be willing to lead the discussion?

Paul: I'll initiate it.

Submission: Dave Halasz – doc 03/182r0 - Clause 2 Motions for TGi Letter Ballot 52 Comment Resolution

<note: edits made to comment 301>

Motion by Frank Ciotti:

Instruct the editor to incorporate the changes specified in document 03/182r0, excluding Comment 301.

Second: Nancy Cam-Winget

Discussion:

None

Chair: Any objection?

No objection

Motion Passes

Submission: Dave Halasz – doc 03/183r0 - Clause 3 Motions for TGi Letter Ballot 52 Comment Resolution

<note: edits made to comments 305, 1087,1088, [1091, 1674], [1230,1675]>

Comment 1367 - return to SG.

Reject comments 1310 and 2024.

Comment: We should remove the terms encapsulation/decapsulation as they are used incorrectly and replace them a more appropriate term. Possibly use the word Format.

Chair: We will make changes and create a new revision.

Submission: Dave Halasz – doc 03/184r1 - Clause 4 Motions for TGi Letter Ballot 52 Comment Resolution

<duplicate for PRF Comment 1667, and PTK 903>

Motion by Frank Ciotti:

Instruct the editor to incorporate the changes specified in document 03/184r1, excluding Comments 1667 and 903.

Second: Larry Green

Discussion:

None

No objection

Motion Passes

Paul has placed a new revision of document 03/118r4 on the server for those that would like to review.

Chair: I encourage people to attend the 802.1 meeting this afternoon at 1:30pm

Chair: Any objection to recess until tomorrow at 8:00am

None

Recessed at 9:55am

Thursday, March 13, 2003

Resume 8:10am

Submission: Marty Lefkowitz – doc 02/684r4 Extended Key ID

Comment: There are other ways to solve VLAN problems. E.g. an AP that supports multiple MAC addresses. This solves the problem with legacy STAs.

Marty: Some APs don't support multiple BSSs

Comment: But your way requires changes on both ends. Using multiple MAC addresses requires changes only on the AP.

Marty: Your solution requires a hardware change. Mine does not.

Comment: I would argue that yours does as well.

Comment: If using multiple MAC addresses, how will the STA know which BSS to associate to? It will see all BSSs advertised from single AP. What if STA associates to wrong BSS? AP Disassociates it?

Comment: I'm concerned if three additional bits are sufficient. Perhaps use one of the bits to indicate that an extended Key ID field exists (e.g. Ext Key IV), and then add an additional field.

Marty: This may break TKIP hardware.

Comment: Is this for TKIP only?

Marty: No, CCM also.

Comment: CCM requires new hardware so this would make sense, but TKIP does not.

Comment: For CCM, since we need new hardware anyway, could we use the extended Key ID bit and new field?

Marty: I would resist adding more bytes to the frame because of encryption. Also, existing CCM hardware would require changes.

Submission: Marty Lefkowitz – doc 02/686 Suggested draft Text for Extended Key ID Proposal

Comment: If you are doing your key lookup in hardware, and you are using more bits for lookup, then that requires a hardware change.

Marty: You may be right for your implementation, but others may not require it.

Comment: I would like some negotiation between the AP and NIC so the STAs don't get these when they don't want them.

Comment: We also have a key type parameter in our hardware that helps to indicate the VLAN mapping.

Marty: I don't understand why they couldn't interoperate.

Comment: Our VLAN experiment indicated that this capability is important.

Comment: We don't have a protocol to force the STA to a different BSSID in the case of an AP that supports multiple MAC addresses.

Comment: I don't see a way to prevent a legacy STA from receiving packets with these extra bits.

Comment: The legacy STA will simply ignore them, as required.

Comment: For unicast, the STA will get permanent decrypt errors. I can't see expanding the space and then not being able to use it for anything but multicast.

Motion by Mike Moreton.

Instruct the editor to incorporate the changes specified in document 02/686r3 into the TGi draft.

Second: Marty Lefkowitz

Discussion:

Comment: For – This is not an issue for STAs that don't support it. We are blocking progress by not voting for this.

Comment: Against – A hardware change is required. This is starting on the path to good solution. Negotiation is required. There are other ways to handle the multicast streams.

Marty: It *may* be a hardware change – this is vendor specific.

Comment: Against – There are not enough bits. We need at least 32 bits as long as we are going to change hardware.

Comment: For – We need this. If you don't want to change hardware, then don't do it.

Comment: Against – As long as we're going to change hardware, let's get more bits out of it. Non-supporting STAs will have a problem decrypting.

Chair: There are a number of VLAN solutions available now that work differently. It's within our scope because it can be used to indicate if encryption is invoked.

Marty: Intent is to not break existing hardware. I know it will work on a lot of hardware. I would like more bits, but 32 is excessive for VLANs.

Comment: Against – This would be good for CCM, but not TKIP since TKIP is for legacy. It is not clear that it is optional. I support the concept.

Comment: Against – Unanimous interest to move forward in mesh network group. If we adopt this as-is, we will discover that we need more bits for mesh networks.

Chair: Any further discussion?

None

Vote: 9–21–7 Fails

Submission: Byoung-Jo Kim - doc 03/173r1 Coexisting of Legacy & RSN STAs in Public WLAN

Comment: In the spec, we state that the Privacy bit is set, but I don't see how this is used. An option should exist to allow non security STAs to associate.

Comment: It would be good to allow the RSN IE to indicate all options supported by the AP's configuration.

Comment: STA's will use the most secure optional automatically, because that is what they should do.

Byoung: Since this is a public service, we're not guaranteeing the highest security.

Comment: This is effective for STAs that don't support a TSN?

Byoung: A TSN indicates the WEP bit must be on.

Comment: In the Beacon only. It says nothing about it being on at the STA.

Comment: There may be a case where you want to allow STAs with no security to associate, because there may be a higher layer security/credentials that come into play.

Jesse: The fee structure should encourage people to use the most secure link options.

Comment: I think its fine in an Internet café if you're just web browsing to leave security off. However, it is important for the user to know which service they are connected to.

Byoung: I don't have a problem with multiple SSIDs. We did not do a survey. If there is no way around it, we will do it that way. We would prefer a single SSID.

Comment: If setting the privacy bits means nothing for RSN, let's get rid of it, as it will cause interoperability problems.

Comment: There are two models, secure/non-secure, with different levels of security. This seems to make non-secure as another level of security.

Byoung: We can control the broadcast/multicast traffic, so this traffic is not as critical as the traffic from the STAs.

Submission: Mike Moreton – doc 03/169 Comment Resolution Motions

Motion by Mike Moreton:

Accept the comment resolution for comment 1900 in document 03/169r2 and authorise the Editor to make the indicated changes with the last instance of "may" changed to "might".

Second: Nancy Cam-Winget

Discussion:

Vote: 31-0-1 Passes

Motion by Mike Moreton:

Accept the comment resolution for comment 673 in document 03/169r2 and authorise the Editor to make the indicated changes.

Second: Jesse Walker

Discussion:

None

No objection

Motion Passes

Motion by Mike Moreton:

Accept the comment resolution for comment 1902 in document 03/169r2 and authorise the Editor to make the indicated changes.

Second: Nancy Cam-Winget

Discussion:

None

No objection

Motion Passes

Motion by Mike Moreton:

Accept the comment resolution for comment 2019 in document 03/169r2 and authorise the Editor to make the indicated changes.

Second: Dave Nelson

No objection

Motion Passes

Motion by Mike Moreton:

Accept the comment resolution for comment 1018 in document 03/169r2 and authorise the Editor to make the indicated changes.

Second: Jesse Walker

No discussion

No objection

Motion Passes

Motion by Mike Moreton:

Accept the comment resolution for comment 675 in document 03/169r2 and authorise the Editor to make the indicated changes.

Second: David Johnston

Discussion:

None

No objection

Motion Passes

Motion by Mike Moreton:

Accept the comment resolution for comment 2032 in document 03/169r2 and authorise the Editor to make the indicated changes.

Discussion:

Comment: If someone wanted to do something like PGP, this would rule this out?

Mike: Yes.

Comment: I want to make sure you are not precluding us from using Open Authentication in an IBSS.

Comment: No.

Comment: Does this say you wouldn't use 802.1X in an IBSS?

Mike: Yes.

Comment: This goes against our model for co-locating the AS in the IBSS STA/Authenticator.

Chair: This surprises me as well. Do we have the EAP methods now?

Comment: PSK clearly needs to be there. There may be other public key methods that are viable.

Jesse: The motivation for doing this is that TGi hasn't made 802.1X useful in an IBSS. We have to have a way to guarantee everyone is using the same cipher suite and SSID. According to clause 11.1.4, when IBSS come together, they must coalesce. The intent is to try to force a decision that PSK is the only way, or address these issues to make secure IBSS actually work.

Chair: You have to manually set these parameters. This does not need to be automatic.

Jesse: I did not indicate it needed to be automatic.

Chair: The 1999 spec doesn't indicate how to coalesce, so we don't have to solve that problem now.

Chair: We will resume discussion on Mike's presentation after the break.

Recessed at 10:05am

Resume at 10:35am

Chair: We will resume with the orders from Tuesday to postpone the Fast Roaming discussion until 10:30am Thursday.

Submission: Nancy Cam-Winget – doc 03/241r0 Fast Roaming Compromise

Discussion:

Jesse: I implore people to study slide 10 very carefully. There were naive assumptions we were making about roaming.

Nancy: I erroneously omitted the MIC.

Comment: Why is the AP sending back Counter 2?

Nancy: It should be Counter 1.

Slide 11

Comment: Why are you using SHA-1 with 64 bits?

Nancy: Because the MIC is 64 bits.

Nancy: We would like NIST and FIPS to be happy with this. The RSN IE is variable length. NIST currently only has CBCR-MAC.

Comment: on slide 7, the number of arguments is not correct.

Comment: What is TGe doing to minimize exchanges?

Comment: In TGe there is a proposal to min exchanges as well.

Comment: Will this be done with management frames?

Comment: Yes, however I don't know if it has been adopted.

Comment: So there will be changes to the Re-association by TGe as well?

Comment: Yes.

Comment: TGe is trying to determine the best AP to roam to using Probes.

Comment: The proposal was to include the TSPEC in the Re-associate frame as well.

Comment: Do we need to secure the TSPEC exchanges?

Comment: This doesn't address the authentication issue because roaming changes the point of attachment. I would suggest modifying the Authentication frames.

Nancy: With the new key hierarchy, there is no need for pre-authentication. The PMK's are unique for every AP. The AS can proactively distribute these PMKs to the APs. The AP also needs the ability to query the AS for the PMK.

Comment: What is the purpose of SRAND. It looks like it is not being used anywhere?

Nancy: Shown is slide 11

Chair: There is no need for pre-authentication with this method. One pre-authentication method is to use management frames or the DS method.

Comment: Why not do pre-authentication at the time of authentication with EAPOL frames?

Nancy: It is at the time that you perform the Association that you have to prove that your keys are live.

Comment: Some of the exchanges could be done in advance. Perform the first 2 messages of the 4-way with Authentication messages.

Tim: In the 4-way, messages 2, 3, and 4 are the commit messages and must be done at Association time.

Comment: Where is the protocol specified to perform pre-authentication via the backbone?

Tim: We are saying that how PMKs get to the AP is not 11i's responsibility.

Comment: Did you say the MK is distributed from AP to AP to roam?

Nancy: No.

Comment: Are you dependent on 11f?

Nancy: No.

Comment: We are dependent on something that is out of our scope.

Tim: This moves the responsibility to where it should be – the IETF.

Comment: What about perfect forward secrecy?

Nancy: We determined that perfect forward secrecy is not a goal for this.

Tim: If it is a goal, use the 4-way handshake instead.

Comment: There is a mechanism needed to push key material to the AP to support this.

Nancy: Correct.

Tim: If you roam back to a previous AP, you don't need it.

Comment: There is a slide 16 that discusses the Association that uses the 4-way handshake. Is this part of the proposal?

Nancy: We are analyzing the security issues of allowing the 2 key hierarchies to co-exist. No, that is not part of this proposal.

Comment: Referring slide 7, it would be nice to have the two methods to be the same and re-use what we have.

Comment: There is more work to be done. What is here can't stand on its own.

Comment: Is the default that the existing Association use the 4-way handshake?

Nancy: Yes

Comment: If one is using PSKs, just stick with the 4-way handshake?

Tim: Yes

Nancy: Jesse has done some work on "Archy" that would allow us to have freshness for the PMK.

Jesse: There are 3 schemes being worked on for roaming.

Tim: There is also the scheme that only works when roaming back.

Comment: I believe pre-authentication via a back-door is evil and anything to eliminate it would be good. We should not feel guilty about stating things are out of scope. Other groups are working on solving this item.

Comment: The assumption are made in 802.1X that messages go through front door.

Tim: 802.1X only defines messages between the Supplicant and Authenticator.

Comment: 802.11k will address the measurements to allow roaming to a new AP, even to a different subnet.

Tim: This information will be transmitted over the wire?

Comment: Yes.

Comment: The work here is a good first step. It is out scope for us to define RADIUS even though there are alternatives. I would like to see a common method to allow interoperability between APs for plumbing this fast-roaming information.

Chair: Some of these are out of scope and are being worked on in the IETF. The IETF does require interoperability.

Nancy: We could ask our IETF liaison make that a SG in the IETF.

Dorothy: A year ago we asked them to do work on EAP methods and key hierarchy. Maybe we should formalize our request for fast roaming.

Chair: On our agenda we have a discussion on a follow-up letter to the IETF that we will get to tonight.

Comment: The statement that if you do anything with EAP methods, it will not be fast is not necessarily true.

Dorothy: There may be EAP methods that could work, but what we have today requires too many messages. Also, going back to the RADIUS servers is an issue. If the IETF doesn't want to continue work on RADIUS, then we have a problem.

Tim: Should we be saying RADIUS and/or DIAMTER?

Comment: The signals are mixed if they want to do key distribution, even in DIAMTER. I don't know. I would suggest not putting all your eggs in one basket.

Motion by Nancy Cam-Winget

Instruct the editor to insert the text from document 03/241r0 into the TGi draft as an optional Key Management scheme.

Second David Johnston

Discussion:

Comment: Against – The text is not ready. There are inconsistencies. The truncation of SHA is inconsistent.

Nancy: More revisions are forthcoming. Can we adopt knowing that we need to make updates?

Comment: We need this, but need to fix first. I am concerned with putting something in the text saying, "miracle happens here". Will draw too many LB comments. Does this mechanism require EAPOL key exchanges discussed with 802.1 yesterday?

Tim: I don't know what affects this will have on the 802.1X state machines.

Nancy: The new key management schemes for 802.1X are modular.

Comment: Against – A great scheme but not fully cooked.

Nancy: My concern in delaying this is that things are never fully cooked.

Comment: Against – There weren't too many LB Comments regarding this. There are other ways to do this. A major change like this at this point is not desirable.

Comment: Against – There are a lot of missing pieces at this point. It will be more difficult to change this later if we put it in now.

Comment: For – There will be a lot more no comments if this is not in the draft.

Chair: For – It will be a good way to get feedback if this is a good direction.

Comment: For – As in implementer, I would like to know if this is the direction we are going. We can fix it later.

Jesse: Call the question

Chair: Any objection

Yes

Vote on calling the question: 48-11-3 Passes

Vote on main motion: 34-23-10 Fails

Recess at 12:02pm

Resume 1:10pm

Chair: We concluded the Fast Roaming presentation with a failed motion, but we did succeed in merging the two different proposals into one.

Straw Poll by Dave Nelson:

How many people would vote for document 03/241 if the issues brought up during the debate were resolved?

Result: 28-3-5

Chair: Any other discussion on Fast Roaming?

Comment: Did the issues brought up address a proposal for a PMK delivery being in or out of scope for IEEE?

Chair: Yes

Chair: Resume Mike Moreton's presentation on Comment Resolution doc 03/169r2

Motion by Mike Moreton

Accept the comment resolution for comment 2032 in document 03/169r2 and authorise the Editor to make the indicated changes.

Chair: We spent a lot of time in Sydney putting this in.

Mike: This will make it mandatory to use PSKs for IBSS.

Chair: So you will not be able to perform any EAP method as PSK will be the only option.

Comment: Against – An AS can be co-located on the STA.

Comment: Against – It is more difficult to implement to the AS in an IBSS, but not impossible. Shouldn't be prevented.

Second: Jesse Walker

Discussion:

Vote: 1-27-6 Fails

Jesse: I'm encouraged by the vote. I call for support to close the gaps in the draft.

Motion by Mike Moreton

Direct the editor to replace all instances of "Authenticated Key Management Suite" with "Authentication and Key Management Suite" .

Second: Greg Chesson

Discussion:

None

No objection

Motion Passes

Motion by Mike Moreton

Accept the comment resolution for comment 676 in document 03/169r2 and authorise the Editor to make the indicated changes.

Second: David Johnston

Discussion:

None

No objection

Motion Passes

Submission: Clint Chaplin – doc 03/242r1 -

Comment: Is it mandatory to support key mapping keys in the base 1999 spec?

Clint: no

Comment: I need to study this more before I can vote on this.

Clint: Fair.

Comment: In the 3rd paragraph, 2nd line, should NIC be STA?

Clint: Yes.

Comment: You may want to change your parenthetical phrases to sentences.

Clint: Fair.

Comment: If this is a boundary condition, do we want to occupy a entire page to describe it? Can we paraphrase?

Clint: Many developers have questions on this.

Comment: For – I never understood this section of the draft.

Clint: I suggest we delay making the motion for four hours to give people a chance to review the document.

Chair: Good suggestion.

Submission: Jesse Walker – doc 02/795r2a Proposed PRF Text Changes

Comment: AES has a block size of ?? bits.

Jesse: We believe one could end up with more entropy than what we have currently.

Comment: Is this the truncated CBC-MAC?

Jesse: No, the full version.

Comment: The author of HMAC said truncating is not a problem.

Jesse: The guidance I received from my previous presentation was to use a CBC-MAC function, and that is what I've done.

Comment: the variables in our doc go from 0 to n-1, rather than 1 to n.

Chair: We need to be consistent with NIST.

Comment: That is how they are in the current PRF.

Comment: By having an AES based key derivation function, we would be addressing two letter ballot comments.

Comment: If there is an AES engine in hardware, this would make things easier.

Comment: Regarding TKIP, it would be nice to have just one.

Comment: We have WPA that is currently implemented and tested. If we change TKIP too much, people won't implement it. They will say WPA is good enough.

Comment: I'm hearing the reasons for doing this are no longer valid. (entropy reduction, NIST, ...)

Jesse: The guidance I received was that we don't like the one NIST is recommending.

Comment: Yes, we are losing some entropy, but so what. We still have 160 bits remaining.

Jesse: What we are trying to do is address LB comments.

Comment: What was the motivation for the two LB comments? We are relying on the crypto experts to tell us the right answer. In the past we were told SHA1 was correct and we adopted it.

Jesse: The reason I wanted it was for highly restrained environments – only a single function required. When NIST asked for review of their draft, they only had SHA algorithms. Seemed like an opportunity to influence them.

Comment: If there is entropy reduction of 256 to 160 it could be an issue as some NIST algorithms require a 256 bit input.

Jesse: If we do not pass this, at the very least we need to decide if we want to stick with HMAC-SHA1 and ask for approval, or drop back to one of there approved algorithms.

Comment: One of the desires is to change to AES for everything, we still have HMAC for the 4-way.

Jesse: True

Comment: I'm not happy drafting a spec that has a know attack.

Chair: TKIP won't be NIST approved.

Comment: All of the options on the table are above the security bar. What it comes down to is if we want to propose an all AES solution. When is NIST expected to make a decision?

Jesse: The comment period ends April 3rd.

Comment: So they will be done before us.

Chair: We weren't going to say that FIPS compliant was a requirement, but we would work towards it.

Motion by Jesse Walker:

Instruct the editor to add the text of Clause 8.2.1.1 with text from doc 02-795r2 modifying it such that it only applies to CCMP.

Second: Dan Harkins

Discussion:

Comment: Against – It is a bad idea to have two different algorithms.

Comment: Against – We are going to be keeping TKIP around for a long time.

Comment: For – We have AES anyway for CCMP.

Comment: How will NIST react?

Jesse: NIST has been responsive/supportive thus far. However, this is a different group within NIST.

Comment: NIST knew they had a very incomplete document, so this will round it out. They should be responsive. If there are a lot of comments, they will have another workshop.

Comment: The number of inputs to the PRF are different vs. the current draft.

Jesse: I wanted to map to the NIST parameters.

Vote: 8-8-18 Fails

Jesse: We have a decision to make:

1. Replace the existing PRF with an approved one
2. Do nothing
3. Ask NIST to add HMAC-SHA1 to the approved list.

Comment: I don't think the TG knows what it wants.

Comment: How about a variant?

Jesse: I would be happy to replace AES-CBC-MAC with HMAC-SHA1

Comment: What was the key size for AES?

Jesse: I intended to use 256

Motion by Jesse Walker:

Request the 802.11 Chair to submit the following comment to NIST comments list kmscomments@nist.gov by April 3:

“IEEE 802.11 would like NIST to allow HMAC-SHA1 and AES-CBC-MAC to be used in approved KDFs (Key Derivation Functions) as alternatives to a one-way hash function in Clause 5.3 of the draft SP 800-56.”

Also, instruct the editor to provide justification to be included in the document to the 802.11 WG Chair.

Second: Larry Green

Discussion:

Comment: What is the difference between this and the one we just voted on?

Chair: This includes both HMAC-SHA1 and AES-CBC-MAC.

Jesse: The intent is to get NIST to rule on all KDFs that this group has found interesting.

No objection

Motion Passes

Jesse will provide additional text in a session later today.

Chair: Any objection to recessing until 3:30pm?

None

Recessed at 2:45

Resume 3:33pm

Motion by Frank Ciotti: (addresses Comment 301 – Clause 2)

In Clause 2, page 1 line 24, replace

FIPS PUB 197, Advanced Encryption Standard (AES), 2001 November 26H. Krawczyk, et al, "HMACComment: Keyed-Hashing for Message Authentication", RFC 2104, February 1997.

with:

FIPS PUB 197, Advanced Encryption Standard (AES), 2001 November 26.

H. Krawczyk, et al, "HMACComment: Keyed-Hashing for Message Authentication", RFC 2104, February 1997.

Second: Nancy Cam-Winget

Discussion:

None

No objection

Motion Passes

Motion by Frank Ciotti

Instruct the editor to incorporate the changes specified in document 03/183r1 into the draft excluding the changes for comments 1367, 1310 and 2024.

Second: Dorothy Stanley

Discussion:

No objection

Motion Passes

Submission: Paul Lambert – doc 03/092r5 - Motions

Jesse: I need more guidance on incorporating the document specified in the second motion.

Paul: I will add more clarification.

Comment: There is a question regarding a MIB variable at the top of page 8. Should that be answered before we make a motion?

Paul: The comment is not part of the proposed text.

Comment: In figure 4, are the reserved and priority fields swapped?

Paul: Yes.

Comment: Are we going to reference the NIST document?

Paul: Russ Housley has submitted a document to NIST and IETF. Within a month we should have an RFC we can reference.

Comment: Can you reference documents not approved?

Paul: Yes. Currently it is an Internet Draft, but should be converted to an RFC within a month.

Motion by Paul Lambert

Instruct the editor to replace Clause 8.3.3 in TGi draft 3.1 with the text in document 03/118r5, with the addition of changing the value of 13 to 6 in Figure 4, and swapping the Reserved and Priority fields in Figure 4.

Second: Dorothy Stanley

Discussion:

Comment: Did we leave in the term AAD in the draft?

Paul: We are referring to the RFC document using that term.

Chair: We did remove it from the definitions, and called out fields from 802.11 MAC header.

Paul: We could add the definition with a later motion.

No objection

Motion Passes

Motion by Paul Lambert

Instruct the editor to replace all TKIP and CCMP test vectors in TGi draft 3.1 with document 03/131r4.

Jesse: I would like to know which test vectors section this replaces.

Paul: Why don't we replace all? This document also has WEP and TKIP vectors. Do we want these also?

Jesse: I thought we already had these.

Paul: I haven't traded my vectors with anyone.

Comment: We did, but they didn't match.

Comment: If they haven't been validated, we shouldn't add them.

Comment: Two implementations are not enough to know who is wrong.

Jesse: I feel it is fine to put them in and try to reproduce them with their implementation.

Paul: It would be nice to have normative test vectors.

Second: Jesse Walker

Comment: There are many sections with text vectors. Is this for all including Michael?

Motion to amend by Paul Lambert

Instruct the editor to replace test vectors for TKIP clause F.9.3 and CCMP clause F.9.4 in TGi draft 3.1 with document 03/131r4.

Second: Dorothy Stanley

Discussion:

Comment: Is clause 6.2 out of motion or draft?

Comment: Motion

Comment: How have these been validated?

Paul: We need more TKIP implementations, but I'm confident in the CCMP vectors.

Comment: Can we remove TKIP from the motion?

Paul: I would prefer to leave it in. It is better to be close than wrong.

Comment: Unless the drafts are available for others to implement, we can't verify.

Any objection?

None

Motion Passes

New Main Motion:

Instruct the editor to replace test vectors for TKIP clause F.9.3 and CCMP clause F.9.4 in TGi draft 3.1 with document 03/131r4.

Discussion:

Comment: Against -We have been using the existing test vectors, and we are not sure which is correct, the existing or the new ones.

Paul: We need to publish the vectors in order to receive feedback

Comment: But we have passed WiFi testing with existing vectors. If we change, we may not pass WPA.

Paul: The intent is to match people's implementations.

Vote: 23-1-4 Passes

Discussion on comments regarding Replay Counter.

Paul: Defer to further discussion on whether we want to make Replay Counters the same for TKIP and CCMP, either having them for both, or not having them for both.

Comment: Why was the comment of removing the mandatory EIV bit for CCMP Rejected?

Comment: The purpose is to allow a low level process to determine if the field is there without having to perform a higher layer key lookup function first.

Submission: Dorothy Stanley – doc 03/217r1 – Clause 5 Motions

Motion by Dorothy Stanley

Instruct the editor to replace Clauses 5.9.3 with the text from document 03/217r1, and to remove the current Clause 5.9.3.1, renumbering Figures as needed, omitting the Association Request line in Figure 2, and swapping the arrowheads on the Identity Request and Identity Response messages in Figure 2.

Second: David Johnston

Motion to amend by Dave Nelson

Instruct the editor to replace Clauses 5.9.3 with the text from document 03/217r1, and to remove the current Clause 5.9.3.1, renumbering Figures as needed, omitting the Association Request line in Figure 2, and

swapping the arrowheads on the Identity Request and Identity Response messages in Figure 2, and removing the second sentence in list item one of the Pre-Shared Key description.

Second: David Johnston

Discussion:

None

No objection

Motion Passes

New Main Motion

Instruct the editor to replace Clauses 5.9.3 with the text from document 03/217r1, and to remove the current Clause 5.9.3.1, renumbering Figures as needed, omitting the Association Request line in Figure 2, and swapping the arrowheads on the Identity Request and Identity Response messages in Figure 2, and removing the second sentence in list item one of the Pre-Shared Key description.

Discussion:

None

No objection

Motion Passes

Motion by Dorothy Stanley (LB52 comments: 4, 5, 219, 255, 314, 320, 905, 906, 1093, 1194, 1205, 1236, 1498, 1678, 1679, 1998

Instruct the editor to change the text in TG_i draft

5.4.2.2 Association

Add the following paragraph after the second paragraph of clause “5.4.2.2 Association”:

“Within an RSN this situation is slightly different. In an RSN the IEEE 802.1X port determines when to allow general data traffic across an IEEE 802.11 link. A single IEEE 802.1X port maps to one association, and each association maps to an IEEE 802.1X port. The IEEE 802.1X port blocks general data traffic from passing between the STA and the AP until an IEEE 802.1X authentication procedure completes. Once IEEE 802.1X authentication and key management completes, the IEEE 802.1X controlled port unblocks.”

Second: Dave Nelson

Discussion:

None

No objection

Motion Passes

Chair: Given that we are not going to make it to re-circulation this meeting, we should plan to have a TG_i ad-hoc meeting before the next IEEE meeting. Are there volunteers?

Straw Poll

Location for the TG1 AdHoc meeting before the Singapore meeting

- Santa Clara (nVIDIA) 20
- Paris, France (Gemplus) 7
- Mansfield, MA (Motorola) 15

The ad-hoc will be hosted by nVIDIA in Santa Clara

Chair: We need to give 30 days notice.

Chair: The dates shall be April 22, 23 & 24.

Clint withdraws his submission 03/181 until the Singapore meeting.

Recess until 7:00pm

Resume 7:10pm

Submission: Jesse Walker – doc 03/204r0 – EAP Archie

Comment: the Internet Draft made it out in time.

Jesse: The third message on Slide 6 should not have the counter parameter in it.

Comment: Would you put this in as an EAP default for 802.11?

Jesse: I don't know. It is an IETF document now.

Comment: You're not going to be able to deprecate MD5.

Comment: What IETF working group?

Jesse: EAP

Comment: Could you contrast Archie with Kerberos?

Jesse: This is a two party scheme, Kerberos is a three party. Kerberos would be issuing a ticket.

Comment: Take a look at the EAP Kerberos draft.

Comment: Is there a time synchronization required for this?

Jesse: No, just a nonce exchange.

Comment: What goes into the nonce?

Jesse: 256 random bits, AES encrypted with AES Key Wrap.

Comment: Why the name Archie?

Jesse: A year ago we started work on a new scheme at the St. Louis meeting, under the "Arch". The protocols were called Louie.

Submission: Dorothy Stanley – doc 03/243r0 – Input to IETF EAP Working Group

Dorothy: We've been asked to provide input to the IETF on a couple of topics (EAP methods & credentials, key strength requirements).

Dorothy: There was not much of a response to the request for input in Seattle.

Dorothy: Any additions to the list in the document?

Jesse: Protection against Man-in-the-middle attacks.

Jesse: Fast resume is very important

Dorothy: Whenever using EAP protocols, does that require accessing the EAP server?

Jesse: Yes, but no more costly than going to a new AP. TLS fast resume replaced public operation with symmetric key operation.

Jesse: Another issue is how to get new credentials out to the mobile terminals? A mechanism is needed to automate the process.

Jesse: The only item on the list that I am concerned about is the identity hiding since I don't know how to do that.

Dorothy: Perhaps we could divide the list into desired and required.

Chair: Some of the fast resume solutions we're seeing do not have pre-authentication in them, so a fast resume would be necessary.

Chair: For identity hiding, if we're talking about MAC addresses, that is an issue. But PEAP does provide hiding for the user name.

Dorothy: We had discussion on MAC address hiding, but the group decided that wasn't something we wanted to pursue.

Comment: There are two lists we need – mandatory items we must have to meet our security goals, and other.

Jesse: The appropriate thing to say is the mandatory EAP method doesn't meet our requirements.

Dorothy: Any feedback on asymmetric support?

Jesse: My prejudice is that enrollment methods will all take this form.

Dorothy: So leave this item as a "nice to have"?

Jesse: Yes. I worked on a solution for this. We will see if my company wants to move forward with it.

Dorothy: Any feedback on key strength?

Comment: Move this paragraph to the beginning of the letter.

Dorothy: Agree.

Dorothy: There is now an RFC for a liaison report that I will draft.

Dorothy: I need to get this on the server tonight.

Chair: If we could get this on the server tonight, then it could be presented tomorrow as a task group item instead of an individual submission.

Motion by Frank Ciotti:

Move to empower TGI to hold an interim meeting in May 2003 to conduct business required to making progress with respect to letter ballot or re-circulation process, conduct teleconferences, create new draft and handle other business necessary to progress through the IEEE standards process.

Second: Clint Chaplin

Discussion:

None

Vote: 19-0-0 Passes

Chair: Jesse, do you have the NIST letter text available?

Jesse: Yes.

The text for the letter to NIST will be as follows:

A strong theoretical basis exists for using HMAC-SHA1 and AES-CBC-MAC as pseudo-random functions. Also, HMAC-SHA1 and block ciphers in CBC-MAC mode are used widely as pseudo-random functions. Since the heart of any key derivation function is typically a pseudo-random function, it seems appropriate to consider these for use in NIST-approved key derivation functions. The IEEE 802.11 Task Group i has already adopted HMAC-SHA1 and is considering using AES-CBC-MAC.

Submission: Clint Chaplin – doc 03/242r3

Clint: The standard algorithm for key mapping indicates the key mapping key index will be zero.

Clint: This clarifies the need of the pairwise key subfield flag.

Clint: The only reason we did not get LB comments on this is because the implementers had not implemented it yet.

Clint: The AP controls how the STA handles keys. If the STA cannot support key mapping, the AP needs to know that.

Comment: This is TSN only.

Comment: I think this is too long and confusing. It should be shortened.

Clint: We tried a shorter version, but we still had questions.

Comment: If the STA doesn't support key mapping, then we shouldn't support them.

Clint: The install base is too large to ignore them.

Comment: Is this for CCMP as well?

Comment: No, only for TSN.

Comment: But CCMP STAs can be part of a TSN.

Comment: Yes, but CCMP STAs are required to support key mapping.

Clint: This is not a technical change, it is simply explaining what is already there.

Motion by Jon Edney

Instruct the editor to incorporate the text from document 03/24r3 into the TGi draft.

Second: Clint Chaplin

Discussion:

Comment: Against – The text will raise more letter ballot comments.

Comment: For – Better to have descriptive text and fix later.

Call the question by Mike Moreteon

Any objection to calling the question?

None

Vote: 13-3-3 Passes

Submission: Mike Moreton – doc 03/168r0

Mike: This is a way that management frames could be encrypted.

Comment: Does the existing standard say anything about setting the WEP bit on management frames?

Mike: No.

Chair: Dorothy has new text for the IETF Letter:

From: Stuart Kerry, Chairman IEEE 802.11
To: Harald Alvestrand, Chairman IETF, IESG
Title: Input to IETF EAP Working Group on Methods and Key Strength
Purpose: For Information

Dear Harald,

We thank the IETF and the EAP WG for its ongoing work supporting the specification of EAP methods, EAP keying, and RADIUS keying attributes.

The purpose of this letter is to provide the EAP WG with additional input on (a) the EAP methods and credentials that are important to IEEE 802.11 wireless LAN deployments, and (b) IEEE 802.11i EAP Key Strength requirements.

EAP Methods and Credentials

Deployments of IEEE 802.11 WLANs today use several EAP methods, including EAP-TLS, EAP-TTLS, PEAP and EAP-SIM. These methods support authentication credentials that include digital certificates, usernames and passwords, secure tokens, and SIM secrets.

The IEEE 802.11i draft specification requires that one or more published, reviewed EAP methods are available which

- Support the following credentials: digital certificates, user-names and passwords, existing secure tokens, and mobile network credentials (GSM and UMTS secrets).
- Generate keying material
- Support mutual authentication
- Are resistant to dictionary attacks, and
- Provide protection against man-in-the-middle attacks.

It is desirable that the EAP methods have the following attributes

- Support fast resume
- Support end-user identity hiding
- Support for public/private key (without necessarily requiring certificates)
- Provide asymmetric credential support (password on one side, public/private key on the other), and
- Protect legacy credentials, such as passwords, from direct attack.

The current mandatory-to-implement EAP method is EAP-MD5. EAP-MD5 does not meet IEEE 802.11's requirements. We request that the mandatory to implement EAP methods be augmented to include one of the methods that IEEE 802.11 is able to use.

Key Strength Requirements

IEEE 802.11i RSN networks will use IEEE 802.1X and EAP methods to implement end user authentication, and require that these EAP methods provide keying material. The IEEE 802.11i requirement is that

The EAP method must be capable of generating keying material with 128-bits of effective key strength. Key material must be at least 256 bits in length.

Please contact Stuart Kerry, IEEE 802.11 Working Group Chair and David Halasz, IEEE 802.11i Task Group Chair dhala@cisco.com with any questions, and to discuss IETF follow-up.

Stuart Kerry

Motion by Dorothy Stanley:

Request IEEE 802.11 Working Group Chair to forward the above letter to the IETF Chair.

Second: Jesse Walker

Discussion:

None

No objection

Motion passed

Submission: Mike Moreton – doc 03/152 Michael Countermeasures State Machines

Comment: Is this SDL?

Mike: No.

Motion by Mike Moreton:

Instruct the editor to incorporate document 03/152r0 into the TGi draft

Second: David Johnston

Discussion:

Comment: Is this informative?

Mike: Yes.

No objection

Motion Passes

Chair: Are there any further motions?

Motion by Paul Lambert

Instruct the editor to replace the second sentence of the first bullet of clause 8.3.3.3.3 with following text:

“Construction of the Nonce when QoS traffic class is available as specified in clause 8.3.3.6.1.”

Instruct the editor to add the following text to the first paragraph of clause 8.3.3.6.1:

“When there is a QoS traffic class, the traffic class is encoded in bits 0, 1, 2 and 3 of the Nonce Priority octet. Bits 4, 5, 6 and 7 are reserved, and they are always set to zero.”

Second: Dorothy Stanley

Discussion:

None

No objection

Motion Passed.

Paul will place the document on the server as revision 7.

Chair: There are three items we need to cover in tomorrow’s Closing Plenary; empowerment for May mtg, the IETF liaison letter, and the letter to NIST.

Chair: Are there any objections to adjourning?

None

Adjourned at 9:30pm

**IEEE P802.11
Wireless LANs**

Meeting Minutes for 802.11j March, 2003

Date: March 13, 2003

Author: Christopher J. Hansen
Broadcom Corporation
190 Mathilda Place, Sunnyvale, CA 94086
Phone: +1-408-543-3378
Fax: +1-408-543-3399
e-Mail: chansen@broadcom.com

call to order - 03/11/02 Secretary: Al Garrett

Shueng Li discusses agenda and the fact that we are under general orders.

Shueng Li indicates that no IP notices have been filed.

Current "draft" is not an official working draft until voted on.

Any requests to modify the agenda. None.

Chris Hansen has requested to be added to open issues.
Al Garrett has requested to be added to technical issues.

Motion to approve agenda: Peter Ecclesine
Second: Rolf
Unanimous.

Moving forward with review of MMAC efforts...
Yasuhiko Inoue, NTT 167r1
MMAC Activities

Question from Rolf: When do you expect 10MHz and 5MHz discussions?
Answer: We could start be next summer, but will not if there is no market requirement for definition.

Question from Peter: Would regulations allow for 10MHz BW in 5.15 to 5.25 band?
Answer: Regulations have not changed for 5.15GHz to 5.25GHz band.

Question from Mark Webster: What happens after the draft goes to ARIB?
Answer: ARIB just approves the draft. If approved it is published.

Question from Lior: Regarding the channel numbers that you show on slide 6, is there a requirement for 2.5MHz offsets due to the 5MHz channelization.
Clarification from Peter: The documents indicate that the 5MHz channels are offset from 5MHz spacings by 2.5MHz. How do you number a channel that is at 4912.5MHz since you numbering definition can only do 4910MHz or 4915MHz.
Answer: Does not address this issue for the time being.
Clarification from Shueng Li: Answer is that if 5MHz requirement is dropped the offset is not required.
Lior: So we need to make a decision whether we should drop the 5MHz channels or maintain them within this body.

Moving forward with open issues...

Chris Hansen, Broadcom 163r1

Narrow Bandwidths in TGj

Peter declares reasoning behind ppm requirements in draft. 11a could utilize 30ppm oscillators with current short sync definition. Therefore 10MHz could utilize 15ppm and 5MHz could utilize 7.5MHz.

Rolf: Why are we discussing this?

Peter: Adjacent channel issues. Utilizing 10MHz channels would allow greater user capacity in limited bandwidth domains.

Shueng Li: Do you anticipate presenting technical solutions?

Chris: Not this meeting, maybe Singapore.

Peter: Maybe we choose not to address 5MHz channelizations. iBSS operation must be prohibited on these channels in Japan. CCA sensitivity discussion. Then forward to

Motion to delete 5MHz channelization from draft.

First: Yasuhiko Inoue

Second: Hansen

No discussion.

Unanimous consent.

Speednet has dropped its request for 5MHz channelizations and thus there is no longer a need to define the 5MHz channels.

Peter E. will prepare a 1.1 draft with all references to 5MHz removed.

Moving Forward with 802.11j Draft 1.0...

Shueng Li requests that all parties voice concerns during discussion to speed process and provide discussion on issues.

Peter E. begins discussion of current draft.

Section 9.9 will address the requirement that a device cannot operate in iBSS mode in the Japanese regulatory domain.

Figures for OOB rules should be added as informative in .eps format.

CCA times in table are inconsistent with times in CCA sensitivity paragraph. Chris Hansen indicates that longer CCA time is preferable.

Peter discusses implication of 4ms limitation. Can be solved with dynamic fragmentation in the MAC.

dot11WorldFrequencyBandSupported is present to allow definition of channels from 2GHz to 6GHz operation. Indication that the FCC will open 3.5GHz band for operation and that the 4.9GHz band is open.

Motion: Request to remove all references to 10MHz bandwidth from 11j draft. Rolf

Second: Richard Williams

Peter E. speaks against the motion. There will be 10MHz channel systems in Japan. Prefer to wait for letter ballot to see if 10MHz should be removed. 5MHz had no proponents, but 10MHz has proponents.

Rolf: Only example provided to date is FWA. When PAR was approved, I did not realize that 10MHz bandwidths. This is much broader in scope than I expected.

Shueng Li: Anyone speaking in favor.

Richard Williams: I think we should scale back to gain more general agreement.

Shueng Li: Speaking as an individual, NWA is something most are not familiar with... Hot spot or other applications. Nomadic Wireless access is in many ways WLAN access. Scope of original PAR is to support modes of operation in 4.9GHz in Japan. As long as there are companies interested, if we do not provide a standard an arbitrary non-standard will arise. As far as analysis of suitability, we are limited to the well-defined rules of Japan. For example, a discussion on how this might apply to Korea would be out of order.

Lior: In favor of motion. MMAC has shown that they will not pursue 10MHz definition. Chris indicated there are implementation issues with this. Waiting for letter ballot implies the need for 75% vote to remove.

Richard Williams: Something about compatibility.

Peter E.:

Mark: I would embrace the motion for now because there is clearly a cost impact while it is not clear that there is a potential benefit.

Shueng Li: I agree with you in part. There is clearly a cost impact. However, we are attempting to define a 10MHz solution that is extremely similar to our 20MHz system such that the difference between 10 and 20 is minimized and thus cost is controlled.

CC: Speaks against motion.

Shueng Li: Clarifying, there is precedence for this scaling approach. Another solution utilizes the scheme of 1/2 clocking to provide 10MHz channels. Again speaking as an individual, I speak against the motion.

Rolf: MMAC is going to focus on 20MHz now and wait until later for 10MHz. Can't we do the same.

Peter: We don't need to maintain step with MMAC.

Rolf: Part of the unease is the implication outside of 4.9GHz. If this is restricted to 4.9GHz I would rest easier.

Question has been called...

Motion to remove 10MHz reference...

7 against

5 for

Chair rules that motion requires 75% to pass as a technical motion.

Peter asks "Is the editor to remove 10MHz for the draft or not?"

No clear guidance on this issue. 75% approval will be required for moving to letter ballot.

Straw Poll: Who would vote to approve draft with 10MHz in the draft

5 for

7+ fail.

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8 for

1 fail

We will need to ask the parliamentarian to clarify rules for technical and editorial changes.

Jo Li: Remove references to bands outside of 4.9GHz.

Rolf: Clarify your concern.

Jo Li: My concern is providing for operation in bands that are not currently allowed.

Peter: Could we strike `dott11WorldFrequencySupported` and instruct editor to limit scope to specific Japan bands

For 11

Against 0
Abstain 0

Peter will supply new draft before noon tomorrow.

Call for Orders of the day.
We are adjourned.

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Jo Li: My concern is providing for operation in bands that are not currently allowed.

Peter: Could we strike `dott11WorldFrequencySupported` and instruct editor to limit scope to specific Japan bands

For 11

Against 0

Abstain 0

Peter will supply new draft before noon tomorrow.

Call for Orders of the day.
We are adjourned.

Call to Order 3/13/03

8:00am

Peter Ecclesine reviews potential draft documents. All three documents have 20 MHz channels. One has document has 802.11h features and another document has 10 MHz channels. Later we will vote on which will be the draft.

Discussion on merits of adding TGh features into the draft. Arguments for include the benefit of DFS in this new band. Arguments against include the lack of requirements for DFS/TPC in this band.

Motion:

Move that all elements of TGH from the editor's document be removed. A. Myles / R. De Vegt. 20 for; 4 against; 2 abstain. Motion passes.

Channel number review. Requirements review from 02/533r0.

Currently, we have removed 5 and 10 MHz can removed from our working document. MMAC would like to see a 10 MHz system, with increased range as one benefit. Y. Inoue would like to see a 10 MHz channel plan for TGj.

No additional technical presentations.

Motion:

Move to adopt our text as the 802.11j draft 1.0. M. Audeh/B. Neilson. 28/0/0. Motion Passes

Motion:

Move to request an IEEE 802.11 working group letter ballot on draft 1.0 of the 802.11j draft to be issued within 14 days following the close of the March 2003 session. A. Myles/Y. Inoue 26/0/0. Motion Passes.

Motion:

Move to empower Task Group J to hold teleconferences and interim meetings to discuss and resolve letter ballot comments, and, if necessary and confirmed by the working group at the May 2003 meeting, issue subsequent letter or re-circulation ballots. P. Ecclesine/C. Hansen. 25/0/0. Motion passes.

Meeting adjourned.

**IEEE P802.11
Wireless LANs**

TGk Minutes for the March 2003 Session

Date: March 10-14, 2003

Author: Harry Worstell
AT&T Labs - Research
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Phone: 973-236-6915
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e-Mail: hworstell@research.att.com

1) March 10, 2003 Evening Session

- a) The Chair went over the RRM Services and presentation topic**
 - i) Commanded STA action service
 - (1) autonomous action from last meeting presentation
 - (a) these are point of discussion
- b) Agenda**
 - i) Review RRM Status
 - (1) Status from Chair (Teleconferences 1 & 2)
 - (2) Status from Simon Barber (Teleconferences 3 & 4)
 - ii) RRM Services and Presentation Topics
 - iii) Call for Papers
 - (1) Lee (“Dynamic Coverage Control for Authorized STAs in Home/Apt Environment” – 03/147r0
 - (2) Kaiser
 - (3) Moreton
- c) Agenda approved unanimously**
- d) Chair covered the first 2 teleconferences**
 - i) Both calls were dedicated to finishing the Issues and Requirements document
 - ii) The third call was lead by Harry Worstell
 - (1) Simon Barber was scheduled to lead the call but was not feeling well
 - (2) Harry started the call with some personal observations
 - (a) Issues and Requirements document should be completed ASAP
 - (b) These types of documents in Task Groups form a starting point but have little long-term use in the Task Groups
 - (c) Would like to see the beginning of submissions of presentations containing normative text that can be voted into a draft
 - (3) Simon agreed with the concept and discussion continued until the end of the call
 - iii) The 4th call was lead by Simon barber and minutes were kept by Tamara Shelton
 - (1) The call covered editing issues
 - (a) Need to leverage TGh Measurements
 - (b) There was a debate on the importance of discovering other APs
 - (2) A call for presentations
 - (3) Presentation by Steve Pope (“Signal Quality Measurements” 03/029)
- e) Richard Paine presented “RRM Architecture Considerations”, paper 125r2**

- i) Architectural elements
 - (1) interface to upper layers
 - (2) changes are in the PHY and MAC
 - ii) AP measurements
 - (1) Base Measurements
 - (2) per AP Measurements
 - (3) per STA measurements
 - (4) Requested Measurements
 - (5) Hand-offs to higher layers
 - (6) Measurement policies
 - (7) Measurement Topologies
 - iii) Policies are needed to be defined
 - (1) RSSI Joe Kwak paper 100r3
 - (a) need different measure along with rssi
 - (b) some would like RSSI acronym changed
 - (c) some would like the definition tightened
 - (2) May need topologies per AP
 - (3) STA measurements
 - (a) how do the measurements get passed
 - (b) Lenix has objects as NDIS
 - (c) Neighbour definitions Neighbour list
 - (d) Hand shake and post authentication
 - (4) Comments:
 - (a) Would like to provide a macro
 - (b) Need to put a stake in the ground with our work
 - (c) it is this groups job to write the draft as best they can
 - (i) Use the rollup document to (1999-2003)
 - (d) Chair suggests group should finish the architecture document
 - (i) Frame work is in section 18 (Overview of RRM services)
 - (e) Setup services
 - (i) Beacon
 - 1. Neighbour list (available APs)
 - (ii) Probe Response
 - 1. Association
 - (iii) Special Management frames
 - 1. Updates for better options, change channels...
 - a. Document 174 covers this
- f) **Marty Lefkowitz presented "Site Reporting" 03/174r0**
 - i) BSSID match status added
 - (1) Preferred
 - (2) ESS
 - (3) 3 capability
 - (4) 5 rogue AP don't connect
 - (5) trusted –
 - ii) Daryl Kaiser has similar ideas should collaborate
 - iii) Would like more discussion on who is in control of the wireless network
 - iv) Will Need site reports for fast roaming
 - v) should provide measurements for fast roaming mechanisms
 - vi) need to get text formulated to discuss among our selves and other groups

- vii) How do you get all the info the MIB has?
 - (1) SME contains MIB elements
 - (2) requires the STA to have the MIB definition in the SME
 - (3) Is that good enough for the STA
 - (4) Can't define how it will be used by the client
 - (a) Microsoft 0-cfg
 - (b) Distribution service
 - (c) Some of the H services
 - (d) Provide the MIB information in the client so it can be used by the client if it wants to but provide a mechanism for AP to obtain the client MIB

g) Session recessed at 9:26

2) Tuesday March 11 Morning Session

- a) **Meeting Called to order 8:00AM**
- b) **Chair reviewed the last session and some discussions**
 - i) 3GPP will need loading factor information
 - ii) Hand-offs would be used in 3GPP and the new 802-20 working group
 - iii) 802-20 does not have any spectrum yet and are looking for licensed frequencies
- c) **Tar-Jin Lee presented "Dynamic Coverage Control for Authorized STA in Home/Apt. Environment" 03/147**
 - i) Problems
 - (1) Densely populated WLANs
 - (a) Mutual Interference
 - (i) adjust TX power for optimum coverage
 - (ii) Use Dynamic Coverage Control (DCC)
 - (iii) cell engineering
 - (iv) DCC procedures covered
 - 1. Issues
 - a. AP power dynamic over time
 - b. Client needs Max power for initial coverage
 - c. Rogue APs (Next house) adjust power accordingly
 - i. refer to 03/091 Control flow
 - (2) APs in near proximity
 - (a) Rogue APs
 - (3) Unauthorized Access
 - (a) Hear other APs
 - (4) Unnecessary power consumption of APs
 - (a) Transmits at full power at all times
 - ii) Dynamic Coverage Control (DCC)
 - (1) Effective cell engineering
 - (2) Tackle rogue/near proximity APs
 - (3) provides physical access to authorized STAs only
 - (4) maintains optimal coverage area
 - (5) saves power
 - iii) Covered DCC Procedures and several flow diagrams
- d) **J Kim presented "NDIS 5.2 802.11 Objects" - 03/172**

- i) Is a device driver that interfaces to MSWindows
- ii) Adds dot 11 specific calls to support WIN XP WLAN “auto”Config
 - (1) XP implements some functions
 - (a) Initiate scan and receive results
 - (b) command to associate with SSID
 - (c) basic configurations and statistics
- iii) paper covered some interesting NDIS behaviours and parameters
- iv) Recommendations
 - (1) interact informally for feedback and feed forward
 - (2) jointly (TGk/Microsoft) develop access to optional TGk features
- e) **Rodrigo Garces presented “Dynamic Link Quality Measurements” - 03/200**
 - i) Suggests the use of radio to radio requested measurements
 - (1) lists possible command parameters
 - (2) give suggested display statistics
 - (3) can be useful for deployments, network management, and link measurements for handoffs
 - ii) Comment:
 - (1) good for site survey but not practical for VoIP hand-offs
 - (a) takes too much time
- f) **Meeting time left and accomplishments for week**
 - i) Will meet this week:
 - (1) Wednesday morning
 - (2) Thursday afternoon 2 blocks
- g) **Meeting recessed**

3) WEDNESDAY, March 12, 2003 Morning Session

- a) **Meeting called to order at 8:00 am**
- b) **Agenda**
 - i) approve agenda
 - ii) Technical presentations
 - (1) Kaiser 30 minutes No Normative text
 - (2) Kim 10 Minutes No Normative text
 - (3) Lefkowitz/Zhun 50 minutes No Normative text
 - (4) Kwak 2 presentations 40 minutes
 - (5) Pope 20 minutes
 - (6) Black 15 minutes
 - (7) Hasse 15 minutes
 - iii) Motions for final plenary
 - iv) Review of meeting accomplishments
 - (1) Goal – completion of the vision and architecture document
- c) **Agenda was approved by acclamation**
- d) **Daryl Kaiser presented “Proposed Text for Radio Measurement Requests and Reports” - 03/207r0-03/207r0A**
 - i) Proposed 03/207r0 is proposed text for the draft 0.1
 - (1) Management frames with Action subtypes

- (2) Defines a new Action category
- (3) Defines 5 radio measurements
 - (a) Beacon, Frame, and hidden Node
 - (b) CCA, RPI Histogram format same as TGh
 - (i) (Measures only 802.11 energy)
 - (c) Defines a different type of measurement: non-synchronized
 - (d) Spectrum Managed(TGh) – time synchronized measurements
 - (i) Requests STAs to start measuring at a specific time
 - (ii) Requires AP to suspend downlink traffic to off-link STAs
- (4) Defines non-synchronized measurements
 - (a) Facilitates broadcast measurements without traffic “storms”
 - (b) STAs randomise the first requested start time (4mS min)
 - (c) Does not require AP to suspend down-link traffic
 - (d) STAs issue power-save notification when measuring off-channel
- e) **MOTION:**
 - i) Move to require documents containing text that will be voted into the draft be on the server 4 hours meeting time , 8:00am to 9:30pm, prior to being voted into the draft.
 - ii) Moved Harry Worstell
 - iii) Seconded Simon Barber
 - iv) Yes 24 No 0 Abstain 0
- f) Comments on the presentation
 - i) should we generate a recommended practice for MIB
 - ii) Several suggestions for changes were made to the text of the Word document that should be incorporated prior to taking a vote on the document.
 - iii) Measurement duration – collection of traffic on a channel is it the intention for the measurements be broken up
- g) **J Kim presentation “RRM MIB Enhancements” – 03/171r0**
 - i) Text is current MIB with changes incorporated in it
 - (1) Includes present PHY parameters (RSSI, CCA)
 - (2) actions to MIB variables under other branches
 - (3) conformance table
 - (4) Includes per INF counters
 - (5) included TGh report elements
 - (a) Variable names need to be localized
 - ii) Issues:
 - (1) time information on non counter variables
 - (2) Data aging
 - (3) precise definitions of parameters
 - (4) Split MIB per STA or AP
 - (5) reports by other STA table
- h) **Chair covered motions to be brought to mid week plenary**
 - i) (none)
- i) **Thursday session is from 1:00pm to 5:30**
- j) **Chair would like set the schedule for presentations**
 - i) normative text first
 - ii) presentations if time or on teleconference calls (no voting)
 - iii) see meeting agenda for Wednesday
- k) **Daryl moved to recess**
 - i) seconded by Harry Worstell

- ii) Approved unanimously

4) **Thursday, March 13, 2003 Afternoon Session**

a) **Call to or order 1:00pm**

b) **Agenda**

- i) approve agenda
- ii) Technical presentations
 - (1) Kaiser 30 minutes
 - (2) Kim 20 Minutes
 - (3) Lefkowitz/Zhun 50 minutes No Normative text
 - (4) Kwak 2 presentations 40 minutes
 - (5) Pope 20 minutes
 - (6) Black 15 minutes
 - (7) Hasse 15 minutes
- iii) Motions for final plenary
- iv) Review of meeting accomplishments
- v) Goal – completion of the vision and architecture document

c) **MOTION - Adopt agenda**

- i) **Move to adopt Agenda**
 - (1) **Moved Daryl Kaiser**
 - (2) **Second Radrigo**
- ii) **Unanimously**

d) **Daryl Kaiser revised presentation “Proposed Text for Radio Measurement Requests and Reports” - 03/207r2-03/207r2A**

- i) revised draft text
 - (1) Changed Table 0-2,
 - (2) Section 7.3.2.19.1
 - (a) Added “Channel Band indicates the frequency band, taken from **Error! Reference source not found.**, in which the receiving STA shall conduct its measurement.”
 - (b) Changed Table 03- to 0-4 in Scan mode sentence.
 - (c) Added new Table 0-3 Channel Band definitions for radio measurement requests
 - (d) Renumbered the original Table 0-3 to Table 0-4
 - (3) Section 7.3.2.19.2
 - (a) Added text “Channel Band indicates the frequency band, taken from **Error! Reference source not found.**, in which the receiving STA shall conduct its measurement.
 - (4) Section 7.3.2.19.3
 - (a) Added new section “Channel Loading Request” and renumbered following section numbers to reflect the addition.
 - (5) Section 7.3.2.19.4
 - (a) Changed the title form “RPI Histogram Request” to “Noise Histogram Request”

- (b) Added text “Channel Band indicates the frequency band, taken from **Error! Reference source not found.**, in which the receiving STA shall conduct its measurement”
- (6) Section 7.3.2.19.5
 - (a) Changed Table 0-7 and added text
- (7) Added 2.4GHz Channel Band
- (8) Renamed CCA Report to Channel Load Report CLR
- (9) Renamed RI
- (10) Didn't change Page 5
- (11) Discussion:
 - (a) Was quiet element included in this text as in TGh...No
 - (b) Unsolicited CTS may be better or CFP
 - (c) CTS was insufficient in time 32mS for this
 - (d) Is table 20.3 compatible with the TGj work now ongoing?
 - (i) will need to track that.
- e) Move to adopt 03/207r2**
 - i) Mover Daryl Kaiser
 - ii) Second Tim Olson
 - iii) Discussion
 - (1) Friendly amendment
 - (a) Move to instruct the editor to incorporate the text from 03/207r2 into the specified sections of the TGk draft D0.1
 - (i) mover: Malik Audeh
 - (ii) Second: Pactrick Worfolk
 - (iii)yes 13 no 5 abs 5 Fails 72.2%
 - iv) Motion to table the original motion
 - (1) Mover Joe Kwak
 - (2) Second Rodger Duran
 - (3) yes 15 No 9 abs 4 Passed...62.5%
- f) J Kim presented “RRM MIB Enhancements” – 03/171r2A**
 - i) Discussion:
 - (1) Local measurements are on someone else page 7
 - (2) Proposing many MID acronyms here and may not need them all
 - (a) agreed...it is points of discussion
 - (3) STAs may not keep this table all the time – aging is intended
 - (4) Don't know why we need to place this I the draft now
 - (5) Don't want to see measurements that aren't every going to get used
 - (6) Suggested to not vote on it and keep working on the text.
- g) Marty Lefkowitz presented Document 03/174**
 - i) Discussion:
 - (1) Questions on security of rogue bit –
 - (a) a rogue could transmit a fake indication.
 - (2) Question on 5Ghz channel map –
 - (a) does this cover countries outside USA?
 - (3) Question on cross PHY roaming –
 - (a) how would 11b -> 11g roaming work as specified by the PHY type?
 - (4) Question - site report request, site report response both use measurement request, report frame formats - these include activation delay fields. this could use a different request/report frame format

- (5) Concerned about backward compatibility especially with respect to beacons
 - (a) do we have the ability to modify beacons and suggest we don't
- (6) Is the "disassociate eminent" in the scope of group....command?
 - (a) was intended for quick roaming gives STA some time to look for another AP
 - (b) Against having in beacon...
 - (i) list you get back may be of less information from other STA
 - (ii) Hidden nodes can exist and not factual for every STA
- h) Joe Kwak presented "PSNI New PHY Measurement" - 03/218 (normative text)**
 - i) Perceived Signal to Noise Indication
 - (1) Post processing comparative measurement
 - (2) Perceived signal to noise indicator
 - (3) Joe will merge Daryl's presentations for next meeting
 - (4) How do you see this being used
 - (a) Presently limited use that is undefined this would give a better quantification for the signal
- i) Joe Kwak presented "RCPI: Improved RSSI Measurement" - 03/224 (normative text)**
 - i) RCPI (Receive Channel Power Indicator)
 - (1) Signal+noise+interference
 - (2) Suggest that the receive power be wider due to receivers being better than the specification
 - (3) The lower end is more important (-82dBm) -95 dBm is more practical
 - (4) The specification should be tighter than +/- 5dB (+/-2 dB more practical)
- j) Motion:**
 - i) Move to take from the table the motion of Daryl Kaiser.
 - (1) Moved by Tim Olson
 - (2) Second Simon Barber
 - (3) Question Called – no objection
 - (4) yes 18 no 0 abs 1 Passed 100%
- k) Motion:**
 - i) Move to adopt 03/207r2
 - (1) Mover Daryl Kaiser
 - (2) Second Tim Olson
 - (3) Discussion
 - (a) Friendly amendment
 - (i) Change motion to "Move to instruct the editor to incorporate the text from 03/207r2 into the specified sections of the TGk draft D0.1"
 - (ii) Mover: Malik Audeh
 - (iii) Second: Patrick Worfolk
 - (iv) Unanimous
 - (4) Question called – no objection
 - (5) yes 13 no 5 abs 5 Fails 72.2%
- l) Motion:**
 - i) Move to recess
 - (1) Moved Harry Worstell
 - (2) Second Simon Barber
 - (3) unanimous
- m) Meeting recessed at 5:26PM**

5) Thursday, March 13, 2003 Evening Session**a) Call back to order 7:05pm****b) Steve Pope presented “Signal Quality Measurements - 03/158r1**

- i) Paper defines parameters that can be measured/reported and describes signal quality
- ii) Gives examples of modulation to sensitivity to FER
- iii) Issues

- (1) Present radios exceed specifications by varying amounts for different rates
- (2) Shape of FER vs. SNR curve will also vary
- (3) Channel impairments will affect various radios differently

iv) Proposed approach

- (1) define two broad classes of parameters for reporting and measuring
 - (a) Static Radio Signal Measurements
 - (i) Infrequent measurements/characteristics
 - (b) Radio Signal Information
 - (i) Frequently reported measurements – on-air signals

c) Simon Black presented “STA MIB Statistics” –03/232r0

- i) STA measurements that might be of interest
- ii) STA MIB access
 - (1) define measurement request
 - (a) stats and duration
 - (b) 446 octets of data for counter (14*32)for counter in dot 11 base standard today

d) Hasse Sinivaara presented “RRM Measurement Classification” 03/234r0

- i) Autonomous Measurements
 - (1) Threshold triggered scanning
 - (2) Performance triggered scanning
- ii) Is the RSSI window configurable by the AP?
 - (1) Is in the client it self - would be better from the AP
- iii) Wants to define static window with respect to area position then define the time when that window(how often) it is measured

e) Joe Kwak presented “WLAN Handoff Scenarios” - 03/225r0

- i) Scenario Functional Analysis
 - (1) Initial association
 - (2) initial neighbour scanning
 - (3) schedule continuous scan cycles.
 - (4) Use power save mode or NAV based non contention periods to measure on other channels and on other PHYs.
 - (5) Active PHY/Channels – network may update neighbour list
 - (a) Inactive PHY/Channels – longer cycle time (5 min?)
 - (6) Auto: schedule continuous handoff decision evaluation
 - (7) broadcast the loading factor

ii) Discussion

- (1) Daryl Kaiser explained the changes that he and Joe Kwak made to Daryl’s recommended specification.

f) Motion

- i) Move to empower TGk for the May 2003 session to continue its work, make decisions and develop the TGk Draft D0.1
 - (1) Mover Harry Worstell
 - (2) Second Simon Barber
 - (3) Unanimous
- g) **Motion:**
 - i) Move to instruct the TGk Editor to incorporate the normative text from document 03/218r2 into the specified sections of Draft D0.1 of TGk
 - (1) mover: Joe Kwak
 - (2) Second: Bob Meier
 - (3) yes 4 no 14 abs 4 Failed 22.2%
- h) **Motion:**
 - i) Move to instruct the TGk Editor to incorporate the normative text from document 224r2 into the specified sections of Draft D0.1 of TGk
 - (1) Mover: Joe Kwak
 - (2) Second: Walt Johnson
 - (3) yes 15 no 6 abs 2 failed 71.4%
- i) **Motion:**
 - i) Move to instruct the TGk Editor to incorporate the normative text from document 207r3 into the specified sections of Draft D0.1 of TGk
 - (1) Mover: Daryl
 - (2) Second: Steve Pope
 - (3) yes 17 no 0 abs 2 Passes 100%
- j) **Call for the orders of the day**
- k) **Time has expired, the meeting is adjourned.**

802.11m
Meeting Report & Minutes
March 2003

Goals for March 2003

- Review comments on PAR received from other WGs
 - Update PAR and respond to comments
- Solicit items for work of the TG
- Outline procedure for requesting an interpretation of the standard
- Develop a work plan

Proposed Agenda

- Review IEEE Patent Policy
- New business
 - Review comments received on PAR and respond
 - Update PAR, if needed
 - Solicit work items
 - Develop work plan
- Adjourn

Agenda adoption

- Moved: To adopt agenda as proposed
 - Moved: Andrew Myles
 - Second: Mike Moreton
 - Vote: unanimous

PAR Comments Received

- None received

Update PAR

- Moved: Adopt the revised PAR (in the format supplied by the IEEE) as the PAR for TGm.
- Moved: Terry Cole
- Second: Bob Miller
- Vote: Unan

Work Items

- Documents from Jon Rosdahl
 - 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
 - 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
- Andrew's accumulated list
- Recommendation of phase-in for compliance

Interpretation Procedure

- <http://standards.ieee.org/reading/ieee/interp/>
- Send email to Linda Gargiulo
(l.gargiulo@ieee.org)
- IEEE forwards requests to the WG
- WG responds

Work Plan

- Review documents at hand and comments received during sponsor ballot of 2003 edition
- Review other requests
- Prioritize items
- Inline revisions vs. separate annex with individual interpretations
- Work from the prioritized list

Motion to Adjourn

- End of agenda reached – mtg adjourned at 8:35pm CST.
- Members attending:
 - Bob Miller
 - Andrew Myles
 - Sheung Li
 - Terry Cole
 - Mike Moreton

**IEEE P802.11
Wireless LANs**

Minutes of High Throughput Study Group Meetings

Date: March 11,12,13 2003

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Abstract

Minutes of the High Throughput Study Group meetings held during the IEEE 802.11/15 Plenary meeting in Dallas from March 10 through 14, 2003.

Executive Summary:

1. **LB 55 failed (196,93,5) at 68%; 75% was required to pass; 294 out of a pool of 329 voted**
2. **All 227 unique comments were addressed**
3. **The comments were grouped as follows:**
 - a. **28 – editorial**
 - b. **77 – backward compatibility**
 - c. **21 – scope**
 - d. **16 – how to describe the rate objective**
 - e. **13 – channelization**
 - f. **12 – time frame**
 - g. **7 – spectral density**
 - h. **3 – coexistence**
 - i. **50 - miscellaneous**
4. **A revised PAR (doc 11-03/798r7) and 5 Criteria (doc 11-03/799r6) were crafted and approved by the SG**
5. **The Working Group voted to submit these documents to SEC and NesCom for approval to form a Task Group**

6. Jon Rosdahl submitted a suggested time line for the Task Group as document - 11-03-275r0-HTSG-Strawman Timeline for HTSG.
7. Note that in these minutes are numerous comments that were recorded which could play a significant role in guiding interpretation of the intent of the PAR as the Task Group undertakes its mission to develop a High Throughput supplement to the IEEE802.11-1999 (2003 amendment) standard.

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Total – 154 inclusive of all meetings

Tuesday March 11, 8:00-10:00 AM

:

1. Meeting was called to order by chairman Jon Rosdahl at 8:01 AM
2. Jon Rosdahl strawman (doc. 11-03/179r0) program for the week was:
 - Meeting Call to Order
 - Approve/Modify Agenda
 - Review IEEE/802 & 802.11 POLICIES and RULES
 - Approve minutes of last meeting
 - Primary topic - Discuss/Revise PAR and 5 Criteria
 - Joint meeting on Coexistence Thursday evening
 - Recess at 9:30 Thursday evening
3. Motion to approve Agenda by Adrian Stephens, seconded by Colin Lanzl passed w/o comment unanimously (60,0,0)
4. Policies and Procedures
 - a. Everyone gets to vote
 - b. 802.11 policies apply
 - c. Format documents correctly
 - d. 75% rule for ALL votes
 - e. IEEE-SA Standards Board By-Laws on patents and standards was read - RAND
 - f. Inappropriate topics for IEEE WG Meetings was reviewed
 - g. Motion to approve minutes of last meeting by Bruce Kraemer , seconded by Adrian Stephens passed unanimously w/o comment
5. Meeting Objectives
 - a. finalize wording of PAR
 - b. develop response to 5 Criteria
 - c. Send PAR and 5 Criteria to WG 30 days before the May. meeting to perhaps allow the group to function as a TG on Monday of the May meeting
 - d. SG does expire at the end of this meeting
6. LB55 did not pass – 294/=89% return; (196,93,5) => 68% acceptance; need to reverse approximately 40 votes to reach the 75% level; 281 comments, 227 comments were unique (03/180r0 [sorted by name], r1 [sorted by type])

7. Comment Summary
 - a. 28 Editorial
 - b. 77 Backward compatibility
 - c. 21 scope
 - d. 16 rate description
 - e. 13 channel description
 - f. 12 time period
 - g. 7 spectral density
 - h. 3 Coexistence
8. Edited Current PAR is doc. 02/798r3 and 5 Criteria is doc. 02/799r3
9. Straw poll on parenthetical spectral efficiency, should parenthetical detail be removed => No (16,0,lots)
10. After discussion it was decided to address the comments in groups per John's r1 spread sheet starting with the groups having the lowest number of entries.
11. **Motion** by Bruce Kraemer and seconded by Colin Lanzl to remove parenthetical comment on spectral efficiency passed unanimously.
12. Discussion of **best case** project plan for HTSG that John had prepared in advance; it showed that ratification through Revcom would take until June 16, 2006; see doc. 11-03/275r0.
13. Comment from the floor – scope will determine time frame.
14. Motion by Colin Lanzl seconded by Matthew Shoemake to set target completion date in clause 11 according to the project plan Jon proposed passed unanimously.
15. Move to retain Nov. 25, 2005 as sponsor ballot submission date by Bruce Kraemer and seconded by Adrian Stephens passed unanimously.
16. Action for Jon – check this afternoon on what Revcom submittal date really means
17. Action for Jon – check if comment # xx to remove entire para as editorial was in the minutes (secretary note – it was not)
18. Comments 170 and 251 already addressed?
 - a. Two blocks (7 and 12) done
 - b. Started to discuss rate related block of comments
 - c. Colin, does a sentence need to be added to the scope to emphasize that we are considering data throughput and not over the air data rate?
 - d. Is Mbps the correct metric versus Giga or Bytes?
 - e. Should we not specify both data rate and air interface rate? Both Engineering and Marketing perspectives need to be quantified.
 - f. Broadband (BB) to home is much less than home network so why the urgency?
 - g. Actually BB pipe to home will shortly be approaching 20 Mbps?
 - h. How are the comments on data rate group wrt actual rates?

- i. The PAR needed to be more consistent (this is an amendment; i.e., we don't want to form a new WG by creating an entirely new standard).
 - j. Straw poll – should payload size be included in the rate statement? (small agree, large opposed, largest abstained)
 - k. Adrian Stephens– add a phy rate in Mbps and change the units to Bytes in throughput
 - l. Straw poll by Adrian Stephens to include phy rate (35 agree, 25 opposed, 26 abstained)
 - m. Straw poll by Adrian Stephens to use MBps for data throughput at the SAP (7 agree, 56 opposed, 10)
 - n. Straw poll to add an explanatory paragraph in clause 18 to clarify the rate issue (~20, ~2, ~ many)
19. Colin Lanzl will lead an ad hoc group to discuss backward compatibility
 20. Sean Coffey will lead an ad hoc group to discuss scope
 21. No one volunteered to lead an ad hoc group to discuss the miscellaneous comments
 22. Bruce will work on the introductory paragraph
 23. Comment – defer word smithing until Thursday.
 24. Christopher Jones will lead an ad hoc group to discuss rate
 25. It is possible to start a new standard by forming a new WG, e.g. 802.15.
 26. Recessed at 10:04 AM until 7:00 PM this evening

Tuesday Evening 7-9:30

1. Meeting was reconvened at 7:04 PM
2. Discuss comments in doc. 11-03/180r3 which contains editorial changes
3. Motion to accept editorial comments incorporated into r3 moved by Bruce Kraemer and seconded by Sринi.Kandala
4. No discussion.
5. Motion passed (45,0,3)
6. Motion to accept comment # 118 by Colin Lanzl and seconded by Shrinі Kandala passed unanimously
7. Miscellaneous comments (#193, #162) were rejected unanimously
8. Bruce suggested comment #249 be moved to the 'rate' block was adopted unanimously
9. Comment #117 was declined here and referred to 802 SEC as moved by Colin Lanzl and seconded by Tim Wakeley was passed unanimously.
10. Comments #251 and #170 - italics should be on Personal instead of wireless i.e., ('wireless *personal*') in 5 Criteria para 6.3a' adopted unanimously
11. Doc 11-03/180 r3 is simply 11-03/180 r2 with comments of ad hoc group added.
12. Doc 11-03/222r0 reflected the suggested changes to the scope by the ad hoc group as follows:

The scope of this project is to define an amendment that shall define standardized modifications to both the 802.11 physical layers (PHY) and the 802.11 Medium Access Control Layer (MAC) so that modes of operation can be enabled that are capable of much higher throughputs, with a maximum throughput of at least 100Mbps, as measured at the MAC data service access point (SAP).

13. Moved by Adrian Stephens and seconded by Bruce Kraemer to accept wording change to Scope passed (58,0,5)
14. Doc 11-03/222r0 reflected the suggested additions to section 18 of the ad hoc group looking at backward compatibility as follows:

The scope of the MAC and PHY enhancements assume a baseline of 802.11, 802.11a, 802.11b, 802.11d, 802.11e, 802.11g, 802.11h, 802.11i, and 802.11j. The enhancements shall be to support higher throughput. Existing 802.11 standards are typically designated by their peak physical data rates. For example, 802.11a has a peak data rate of 54Mbps but throughput is typically found to be less than 25Mbps, measured at the MAC data SAP. This amendment seeks to improve the throughput to at least 100Mbps, measured at the MAC data SAP, which represents an improvement of at least 4 times the current throughput. Additionally, high throughput devices compliant to this amendment shall respect legacy 802.11, 802.11a, 802.11b and 802.11g spectral mask and channel boundaries to prevent adjacent channel interference in excess of the currently specified levels. Also, high throughput devices compliant to this amendment shall fairly share the available bandwidth in a co-channel usage scenario.

15. Comment – what does “respect” mean?
16. Answer – ‘no worse or invasive/interfering’; constrained to 20 MHz channels and mask?
17. Note, multiple contiguous channel use is NOT being excluded
18. Comment – intent was to reuse existing amendments
19. Comment – is bonding going to be allowed? If yes be specific
20. Comment – HT devices are envisaged to be able to operate in channels around existing legacy channels
21. Comment – spectral mask is an issue
22. Comment – channel widths should be specific
23. Comment – add a header between former text and additional text.
24. No comments were returned from the other 802 Working Groups
25. Presentation by John Terry (doc. 11-03/213r0)
 - a. Title - Why 20 MHz Channelization in HT-SG?
 - b. Thesis - Channel bonding does not increase aggregate throughput in cellular environments;
 - c. Presentation structured around 5 Criteria
 - d. Reuse factor in cell configuration => no improvement in aggregate throughput
26. Question – are 10 MHz channels prohibited in Europe? A – don’t think so.
27. Question – reuse environment in the likely scenarios (i.e., single cells in a home) to be considered do not apply like they do in a multi-cell network
28. Note - Single cell case does have an advantage especially if MIMO is used
29. Suggested changes to the third paragraph by Rolf de Vegt as follows:

Additionally, high throughput devices compliant to this amendment shall **ADOPT LEGACY 802.11A AND 802.11G 20 MHZ CHANNEL SPACING AND NOT DISADVANTAGE LEGACY ADJACENT CHANNEL DEVICES**. Also, high throughput devices compliant to this amendment shall fairly share the available **CHANNEL ACCESS TIME** in a co-channel usage scenario.

32. The scope of the MAC and PHY enhancements assume a baseline of 802.11, 802.11a, 802.11b, 802.11d, 802.11e, 802.11g, 802.11h, 802.11i, and 802.11j*. **THIS MEANS THAT DEVICES BUILT TO THIS SPECIFICATION SHALL INCLUDE THESE OTHER 802.11 AMENDMENTS AS APPLICABLE TO THE FREQUENCY BANDS WHERE THESE DEVICES ARE DESIGNED TO OPERATE.** The enhancements shall be to support higher throughput.

***NOTE – THE FOLLOWING 802.11 AMENDMENTS ARE CURRENT UNDER DEVELOPMENT: .11E, 11G, 11B, .11I, AND .11J. IT IS EXPECTED THAT THESE AMENDMENTS WILL BE COMPLETED LONG BEFORE THE COMPLETION OF THIS PROPOSED TASK GROUP. IN THE EVENT THAT THESE NEEDED AMENDMENTS ARE NOT COMPLETED PRIOR TO THE COMPLETION OF THE WORK OF THIS PROPOSED TASK GROUP THE REQUIREMENT THAT THEY BE INCLUDED IN THE DEVICES BUILT TO THIS NEW AMENDED STANDARD IS REMOVED.**

40. Comment – existing text does not address majority of LB comments on this topic
- 41.
42. Question called.
43. Motion fails (33,16,26) => 67%<75%
44. Move that we adopt only paragraph one made by Sean Coffey and seconded by Brett Douglas.
45. Comment – what does baseline really mean??
46. Motion to table by John Kowalski and seconded by Sean Coffey passed (62, 2,4)
47. Comment #171 was reformatted without objection
48. Comments addressed in morning SG session – #146 to remove ‘affective’ in clause 4 (which is the title) as it is ambiguous;
49. Motion to accept the comment by Majid Malek and seconded by Brett Douglas passed unanimously
50. Discussion on Comment #139
51. Motion to decline comment because it is already included in paragraph one of section 18 passed unanimously
52. Recessed until 3:30 PM Thursday.

Wednesday 1-5:30 Pm

1. HTSG was granted at this mornings
2. Colin Lanzl moved to modify the agenda to include the Wednesday session and continue with comment resolution on the PAR and 5 Criteria leading to a new PAR and 5 Criteria. was seconded by Bruce Kraemer passed unanimously.
3. Comment response 11-03/180 r3 will not be an official document and we will create r4 during our meeting which will be official
4. Backward compatibility response to comments (34,96,103,1,20,26,102,119,132,141,142,179,212,186,213,214,228,275,281,11,253,106,185,85,86,89,113,128,138,157,183,226,229,260,270,277,155,200,233,56,77,83,27,201,23,78,31,69,216,224,182,210,219,130,99,111,174,177,279,115,97,92,40,41,107,187,116,255,135,184,124,181,164,54) was suggested by Jon as follows: “A large amount of time and effort was spent on

- the issue of backward compatibility. Your comment was included in the discussion and the SG has prepared a new PAR and 5 Criteria” moved by Tim Wakeley and seconded by Bruce Kraemer was approved unanimously
5. Comment #276 response suggested by Jon - Comment declined using “The SG was created to provide an amendment that provides higher throughput, and believes that the extensions that will be made have not identified whether it is in the MAC, PHY or some combination of both”
 6. Comment #259 response suggested by Jon - Comment declined
 7. Comment #271 response suggested by Jon - Comment declined
 8. Comment #261 response suggested by Jon - Comment declined
 9. Comment #114 and #105 accepted as editorial moved by Bruce Kraemer and seconded by Colin Lanzl
 10. Comment # 211 accepted by being passed on to NesCom
 11. Comment #252 accepted as editorial
 12. Comment #122 and #152 and 131 accepted by yesterday’s edits moved by Tim Wakeley and seconded by Colin Lanzl passed unanimously
 13. Comment #100 was accepted as editorial moved by Bruce Kraemer and seconded by Colin Lanzl passed unanimously
 14. Comment #131 was accepted as editorial
 15. Bottom line - resolved 42 comments
 16. Straw Poll to accept in total (no acceptance)
 17. Straw Poll to go threw in blocks (few)
 18. Straw poll – majority suggested we defer comments on 276,259,271,261 until further discussion on scope.
 19. There were 19 new members attending this HTSG meeting
 20. Response to 21,67,44,194,94 was suggested by Jon as “A large amount of time and effort was spent on the issue of scope and backward compatibility. Your comment was included in the discussion and the SG has prepared a new PAR and 5 Criteria” was moved by Bruce Kraemer and seconded by Boyd Bangerter passed unanimously.
 21. Response to comments 49,109,29,81,84,125,158,50 was suggested by Jon as “A large amount of time and effort was spent on the issue of Scope. Your comment was included in the discussion and the SG has prepared a new PAR and 5 Criteria” and moved by Bruce and seconded by Tim Wakeley passed unanimously.
 22. Motion from Tim Wakeley and seconded by Ken Clements to accept “The SG was created to provide an amendment that provides higher throughput, and believes that the extensions that will be made have not identified whether it is in the MAC, PHY or some combination of both” as a response to 276,259,271,261
 23. Table motion proposed by Rolf de Vegt and seconded by Frank Howley (11,4,9) fails since not 75% achieved.
 24. Motion to call the question by Tim Wakeley did not receive objection and the question was called
 25. Motion passed (13,2,5) to accept the response above to comments 276,259, 271,261.
 26. Comment – Frank Howley did not feel the last motion was handled appropriately
 27. Comment - Rolf de Vegt felt he did not get an opportunity to register his negative vote on the previous motion
 28. Ken Clements felt Jon made no error in facilitating the last vote.
 29. At this time the Power was interrupted, and a 15 minute recess was taken.

30. Sean Coffey presented the new text resulting from the ad hoc group meeting this morning (doc. 11-03/222r1) as

Section 18 - Additional Explanatory Details

“Existing” and proposed new text on scope

Previous version (r0) of proposed first paragraph in Section 18:

Item 12. The scope of the MAC and PHY enhancements assume a baseline of 802.11, 802.11a, 802.11b, 802.11d, 802.11e, 802.11g, 802.11h, 802.11i, and 802.11j. The enhancements shall be to support higher throughput.

New version of ad-hoc group proposed first paragraph in Section 18:

Item 12.

The scope of the MAC and PHY enhancements assume a baseline of 802.11 and its amendments and anticipated amendments ‘a, b, d, e, g, h, i, and j’. The enhancements shall be to support higher throughput. The amendment shall not redefine mechanisms in the baseline that do not pertain to higher throughput.

The following sentence was added to the text on Slide 5 as r2

Some of the modes of operation defined in the HT amendment shall be backwards compatible with 802.11a and/or 802.11g.

31. Comment – add ‘and interoperable’ after ‘backwards compatible’
32. Sean explained – ‘Some’ was carefully chosen to allow new modes as we have done in .11g.
33. Comment – baseline is actually the document we are adding the amendment to
34. Comment – specify ‘some or all of the modes’ instead of simply ‘some’
35. Comment – the word ‘shall’ actually means ‘mandatory’
36. Comment – agree but the issue is really to add ‘and interoperable’
37. Frank Howley proposed an amendment as below:

The scope of the MAC and PHY enhancements assume a baseline***defined by the specification** of 802.11 and its amendments and anticipated amendments a, b, d, e, g, h, j, and i. The enhancements shall be to support higher throughput. The amendment shall not redefine mechanisms in the baseline that do not pertain to higher throughput.

The following sentence was added to the text on Slide 5 as r2

Some of the modes of operation defined in the HT amendment shall be backwards compatible **and interoperable** with 802.11a and/or 802.11g.

***’Baseline’ means that the amendment builds on and is backwards compatible with the original 802.11 MAC**

38. Comment – agree with interoperability and suggest adding the comment in green above.

39. Comment – don't get too specific in the PAR since it will stifle creativity in the Task Group

40. Comment – object to adding interoperable

41. Motion by Sean Coffey and seconded by Frank Howley to add the following text to the start of section 18 as follows:

The scope of the MAC and PHY enhancements assume a baseline specification defined by 802.11 and its amendments and anticipated amendments a, b, d, e, g, h, i, and j. The enhancements shall be to support higher throughput. The amendment shall not redefine mechanisms in the baseline that do not pertain to higher throughput.

Some of the modes of operation defined in the HT amendment shall be backwards compatible and interoperable with 802.11a and/or 802.11g.

42. Motion to amend to add 'k' to the text above made by Malek and seconded by Boyd Bangerter

43. Discussion – opposed because 'k' may not finish before we do.

44. Motion to amend fails (13,25,23)

45. Motion to amend by removing 'and interoperable' by Tim Wakeley and seconded by Weishi Feng

46. Discussion – wanted to keep it in because it clarified backwards compatible

47. Motion fails (4,27,30)

48. Returning to main motion

49. Comment – can an amendment to a standard make a mandatory feature optional.

50. Response – yes but what is compliant can't be made non compliant

51. Call the question

52. Main motion passes (59,2,3) and will be 11-03/222r3

53. Bruce Kraemer asked for discussion of the following paragraph

Existing 802.11 standards are typically designated by their peak physical data rates. For example, 802.11a has a peak data rate of 54Mbps but throughput is typically found to be less than 25Mbps, measured at the MAC data SAP. This amendment seeks to improve the throughput to at least 100Mbps, measured at the MAC data SAP, which represents an improvement of at least 4 times the current throughput. Comment – make the 25 Mbps reference more precise

55. Comment – again, at the PAR level, the more nebulous the better.

56. Comment – in this case more nebulous may be better

57. Comment – would it be better to provide a relevant reference (??X) instead of being specific wrt the 100 Mbps and 25 Mbps numbers

58. Bruce Kraemer ended discussion by volunteering to rework the paragraph based on the comments

59. Consider comments on Channelization comments

a. Comments 25,101,149,87,104,126,129,278,28, reference clause 18

b. Comments 112,254,134,137 address 5 Criteria

c. Discussion – suggested response to comment 137 “The group believes that flexibility on frequency allocation to support new bands is necessary and is the reason it was explicitly left off.” Was moved by Colin Lanzl and seconded by Kevin Negus was adopted unanimously

- d. Response to comment 101, namely “comment declined: The group believes that flexibility on frequency allocation to support new bands is necessary and is the reason it was explicitly left off” was proposed by Colin and seconded by Kevin was adopted (30,5,5)
 - e. Discuss response to comments 25
 - f. Clarification – 20 MHz is a mode of operation
 - g. Comment – don’t know what this means
 - h. Comment – Need worldwide applicability and 20 MHz is legal even though bonding 20 MHz channels is not legal in Japan and Europe
 - i. Comment – need at least a single mode which can be operated globally
 - j. Comment – regulations do indeed change
 - k. Comment – must meet at least three constraints 1) meet regulations, 2) adjacent channel and 3) co-channel interference ; it may be better to specify in this way rather than as a 20 MHz channel
 - l. Straw Poll – Do you support a maximum 20 MHz channelization for HT devices for at least one mandatory mode supporting 100 Mbps throughput?
 - m. Discussion – only 20 MHz or multiples of 20 MHz? Answer- neither
 - n. Straw Poll result – (26,17,15)
 - o. Comment – Channelization is, in fact, not necessary to craft a PAR and 5 Criteria
 - p. New Straw Poll – Do you support at least one High Throughput mandatory mode that meets the current regulations of worldwide geographies? (47yes,5 no,6 abstain)
60. Meeting was recessed until Thursday at 3:30 PM.

Thursday 3-

1. Meeting called to order at 3:35 PM
2. Comment file is 180r6 and it is on the server.
3. 152 comments have been resolved; 76 remain; proposed text for 56 of the 76 has been prepared in the ad hoc meeting.
4. In rev. 5 of 799 (5 criteria) contains suggested changes in blue! Draft 4 has been approved
5. Rev. 5 of PAR has already been approved
6. Comment 12 resolved as “Comment Considered: A large amount of effort and time was spent on the PAR and five criteria. Your comment was included in the discussion, and the SG has prepared a new PAR and 5 Criteria response.”
7. Straw Poll – approved unanimously the following procedure – agree on new PAR and 5 Criteria and then address the comments.
8. Bruce Kraemer presented doc. 222r4 as the output of the ad hoc study group.
9. Motion to accept the following new paragraph (para #3) in clause 18 by Brett Douglas and seconded by Boyd Bangerter.

Existing 802.11 standards are typically designated by their peak physical data rates. For example, 802.11a has a peak data rate of 54Mbps. This amendment has chosen to use a performance metric of throughput measured at the MAC data SAP. This amendment

seeks to improve the **peak** throughput to at least 100Mbps, measured at the MAC data SAP. Depending on the scenario, this represents an improvement of at least 4 times the throughput obtainable using existing 802.11 systems. Discussion

11. Comments – should be ‘peak rate of 100 Mbps’?
12. Response – yes it probably should be 100 Mbps but this is covered in the scope statement
13. Comments – reference “Fast Ethernet explicitly”
14. Amendment by unanimous consent was to add the word “peak”.
15. Comments - peak answers in part the question of referring to ‘fast Ethernet’
16. Comments – clarify if the real objective is 100MHz or 4x current implementations

Comments – remove the last sentence “. Depending on the scenario, this represents an improvement of at least 4 times the throughput obtainable using existing 802.11 systems.” Jon urged members to open draft 5 to ensure total context is understood and clear.

18. Comment – change ‘at least 4’ to ‘approximately 3’
19. Straw Poll to change 4 to 3 failed by a large majority.
20. Comment – add ‘512 bit packet’
21. Straw poll to add 512 bit packet failed by a large majority
22. Straw poll to add a specific packet size to the paragraph fails (18,60)
23. Colin Lanzl called the question **with the word ‘peak’** added and was seconded by Brett Douglas passed (78,4,7)
24. Motion to accept the following new paragraph (last para) in clause 18 by Brett Douglas and seconded by Boyd Bangerter

The impact of an HT device on the operation of a legacy network shall be comparable to that of any other legacy device .Comment – FH should be explicitly prohibited

26. Response – covered elsewhere
27. Comment – concept good but sentence needs structuring
28. Comment – which words would be changed to exclude FH devices
29. Response – append – “in the baseline defined above”
30. Comment – show baseline definition

That text was shown as

The scope of the MAC and PHY enhancements assume a baseline specification defined by 802.11 and its amendments and anticipated amendments a, b, d, e, g, h, i, and j. The enhancements shall be to support higher throughput. The amendment shall not redefine mechanisms in the baseline that do not pertain to higher throughput. Comment – this does not exclude FH!

Colin moved and seconded by Brett Douglas to add as the last paragraph in section 18: **“The impact of an HT device on the operation of a legacy network shall be comparable to that of any other legacy device identified in the baseline defined above”**. Passed (61,3,24)

32. Bruce Kraemer proposed adding the following text to first note of Table 1

In order to make efficient use of scarce spectral resources in unlicensed bands, the highest throughput mode defined by the HT amendment shall achieve a spectral efficiency of at least 3 bits per second per Hertz for the PSDU.

33. Discussion
 - a. Comment – this eliminates UWB
 - b. Response – you are correct and also we did not want bonded channels to be included

- c. Comment – too exclusive
 - d. Comment – current phy is 54 Mbps and therefore slightly less than 3 bits per second per Hertz and therefore this is not aggressive enough.
 - e. Response – the primary goal is still 100 Mbps targeted at Unlicensed bands; we did not want to achieve this at the cost of spectral efficiency
 - f. Comment – too limiting especially for a PAR, should be spec'd at the requirements doc level
 - g. Comment – Agree, PAR is not the design of the standard but a project description to develop a standard
 - h. Straw Poll – was split on issue of including this kind of detail in the footnote
 - i. Comment – amend to “refer to spectrum in the unibands”
 - j. Response – unibands references US in 5 GHz region
 - k. Comments – this is really a clarifying statement
 - l. Comment – extension on 802.11 spec
 - m. Comment – yes this was intended to be mandatory
 - n. Response – this paragraph will now be suggested as para. #4, i.e., the new last paragraph
34. Visual Straw poll – should 3 be changed to 2.7 was not favoured
35. Motion made by Sean Coffey and seconded by Frank Howley to adopt this paragraph
36. Discussion:
- a. Visual Straw poll – should 3 be changed to 4 was not favoured by visual count
 - b. Straw Poll – “should 3 bits/sec/hertz be a selection criteria or a low bar criteria” was split
 - c. Comment – opposed since too restrictive
 - d. Comment – favour since it provides a reasonable bound
 - e. Question called by Frank Howley and seconded by Kevin Negus without objection
37. Motion – to add “**In order to make efficient use of scarce spectral resources in unlicensed bands, the highest throughput mode defined by the HT amendment shall achieve a spectral efficiency of at least 3 bits per second per Hertz for the PSDU**” as paragraph 4 of section 18 failed (64,22,12) at 74%
38. Weishi Feng made a motion to reconsider and was seconded by Peter Ecclestine. Both Weishi and Peter had voted on the prevailing side (i.e., a no voter)
39. Discussion
- a. Again, the purpose is to develop new more efficient modes
40. Motion to reconsider – passes (75,12,7)
41. Returning to the main motion
42. MOVE THE PREVIOUS QUESTION by Ken Clements and seconded by Colin Lanzl passed without objection
43. Main Motion passed (73,23,7) at 76%
44. PAR must be approved by NESCOM and NESCOM tends to want to remove the “alphabet soup”.
45. Meeting recessed at 5:26 PM

Thursday 7PM

1. Meeting called to order at 7:01 PM by Jon Rosdahl
2. Motion to accept blue text in doc. 11-02/799r5 as text for the 5 Criteria was made by Colin Lanzl and seconded by Kevin Negus
3. No discussion
4. Motion passed by (43,0,4)
5. Motion by Frank Howley to remove the following text from section 18 was seconded by Boyd Bangerter
It is a comparison metric but is explicitly not mandated. The question of what possible trade-offs exist between high effective throughput modes and backward compatibility mechanisms requires detailed technical information that is not now available to the HT study group
6. No discussion
7. Motion passed (36,2,8)
8. Discussion returned to addressing outstanding comments
9. Jon noted that if we do each of the outstanding 76 comments individually we will not finish tonight
10. Jon noted responses to 57 of the comments had been crafted by the ad hoc committee and are available in doc 180r6
11. Motion by Tim Wakeley to accept the comment resolution to the 57 comments developed by the ad hoc committee in rev 6 of doc 180, comment resolution, was seconded by Rolf de Vegt.
12. No discussion
13. Motion passed (51,0,11)
14. Returning to the remaining 19 comments
15. Comment #8
16. Proposed response – this is an example of one of several evaluation items and the group recommends declining the comment
17. Motion by Sean Coffey and seconded by Colin Lanzl passed unanimously
18. Comment #8
19. Proposed response – comment accepted and included in the revised PAR
20. Moved by Bruce Kraemer and seconded by Majid Malek passed unanimously
21. Comment #14
22. Proposed response – comment declined; this is an indication that we intend to follow a rigorous process involving definition of requirements and evaluation criteria before calling for technical proposals
23. Motion to accept response by Adrian Stephens was seconded by Bruce Kraemer passed unanimously
24. Comment #25
25. Proposed response – comment accepted; see revised PAR
26. Motion to accept response by Colin Lanzl seconded by Bruce Kraemer passed unanimously
27. Comment #28
28. Proposed response – comment accepted; see revised PAR

29. Motion to accept by Colin Lanzl and seconded by Bruce Kraemer passed unanimously
30. Comment #87
31. Proposed response – comment accepted; see revised PAR
32. Moved by Kevin Negus and seconded by Majid passed unanimously
33. Comment #104 - comment accepted; see revised PAR
34. Motion to accept response by Colin Lanzl and seconded by Bruce Kraemer
35. Discussion – was there any reference to the 20 MHz BW in the response?
36. Response – modes using > 20 MHz mask are not disallowed in this PAR
37. Motion passed unanimously
38. Comment #126
39. Proposed response- comment accepted; see revised PAR
40. Moved by Kevin Negus and seconded by Ken Clements passed unanimously
41. Comment #123
42. Proposed response - comment accepted; see revised PAR
43. Motion by Boyd and Brett Douglas
44. Motion to amend by Colin seconded by Jan to strike “of the standard”
45. Motion to amend passed without objection
46. Main Motion as amended was passed unanimously
47. Orders of the day were set aside infavour of continuing comment resolution
48. Comment #129 accepted unanimously
49. Comment #134 accepted unanimously
50. Comment #149 accepted unanimously
51. Comments #150
52. Proposed response – comment declined ; PAR and 5 C as amended provides sufficient applicability for global acceptance
53. Moved by Colin Lanzl and seconded by Kevin Negus
54. Call the question by Colin Lanzl and seconded by Malek Audeh
55. No objection to calling the question
56. Main Motion passed
57. Comment #151
58. Proposed response - comment declined ; PAR and 5 Criteria as amended provides sufficient applicability for global acceptance
59. Motion to accept response by Brett Douglas and seconded by Colin Lanzl passed unanimously
60. Comment #189
61. passed on for now as not likely to cause the wording of the PAR and 5 Criteria to change
62. Comment #196
63. passed on for now as not likely to cause the wording of the PAR and 5 Criteria to change
64. Comment #218

65. passed on for now as not likely to cause the wording of the PAR and 5 Criteria to change
66. Comment #227
67. Proposed response - comment declined; the task group will deal with this issue
68. Motion to accept this response by Colin Lanzl and Bruce Kraemer passed unanimously
69. Comment #248
70. passed on for now as not likely to cause the wording of the PAR and 5 Criteria to change
71. Comment #254
72. passed on for now as not likely to cause the wording of the PAR and 5 Criteria to change
73. Comment #258
74. Proposed response - comment declined; the task group will deal with this issue
75. Motion to accept this response by Bruce Kraemer and seconded by Jim Lansford passed unanimously
76. Comment #278
77. passed on for now as not likely to cause the wording of the PAR and 5 Criteria to change
- 78. Motion: send 02/798r7 and 02/799r6 which are the PAR and 5 Criteria response to the WG for their consideration for creation of a NEW Task Group and recommend that the WG submit these documents to the SEC and to NesCom moved by Ken Negus and seconded by Kevin Clements passed (75,0,0)**
79. At 8:17 the PAR and 5 Criteria were uploaded to the server
80. Presentation by Jim Lansford (doc 11-03/267) on Coexistence Review Procedure
 - a. Inwardly focused whereas .18, regulatory, is externally focussed
 - b. Suggested to refer to Coexistence in PAR and 5 Criteria but don't be quantitative
 - c. Conclusion – two way street – victim and interferer; .19 will prepare coexistence position after down selection
81. Discussion for Jim
 - a. What happened in .15?
 - b. How will it be dealt with in 802.20?
 - c. Greatest challenge for coexistence – optimise power, spectrum, space, code and time?
 - d. Time constant of feedback loop for .19; Answer - about 50% of TG time constants
 - e. Cordless Phone issue with TR41 resolution?; Answer – company by company basis
82. Jon reported that - Emails were sent to Chair of 802.11, 802.19 and the 802 chair directly, and to the closed reflector that Bob O'Hara is monitoring, and will forward to the rest of the SEC
83. Returning to #189 and #218
84. Comment #189
85. Proposed resolution – comment consider; see revised PAR
86. Motion to accept this response by Colin Lanzl and Bruce Kraemer passed unanimously
87. Comment #218
88. Proposed resolution – comment consider; see revised PAR
89. Motion to accept this response by Colin Lanzl and Bruce Kraemer passed unanimously

90. Comment #149
91. Proposed resolution -comment accepted; see revised PAR
92. Motion to accept this response by Colin Lanzl and Bruce Kraemer passed unanimously
93. Comment #129
94. Proposed resolution – comment considered; see revised PAR
95. Motion to accept this response by Kevin Negus and Colin Lanzl passed unanimously
96. Comment 196
97. Proposed resolution – comment considered; see revised PAR
98. Motion to accept this response by Bruce Kraemer and seconded by Peter Eccelstine passed unanimously
99. Comment#248
100. Proposed resolution – comment considered; see revised PAR
101. Motion to accept this response by Colin Lanzl and Bruce Kraemer passed unanimously
102. Comment #254
103. Proposed response – comment considered; see revised PAR
104. Motion to accept this response by Colin Lanzl and Brett Douglas passed unanimously
105. Comment #278
106. Proposed response – comment considered; see revised PAR
107. Motion to accept by Kevin Negus and seconded by Ken Clements passed unanimously
108. Since our charter will expire tomorrow at noon we should take contingency action to extend the Study Group therefore
- 109. Move: Request that the 802.11 WG continue the charter of the HT-SG through the July 2003 Plenary as a contingency to respond to any outstanding comments from the WG or SEC or NesCom as the PAR and 5 Criteria are processed should the PAR not be approved. By Jim Lansford and seconded by Bruce Kraemer passed (35,0,0)**
110. Jon Rosdahl was thanked by the group for his able leadership of the Study Group. Jon will not be standing for election as chairman of the Task Group should it be formed.
111. Jon noted that a plan for next meeting would hopefully not be needed.
112. Meeting adjourned at 9:02PM!!!!

Minutes Not Yet Available