
IEEE P802.11
Wireless LANs

Tentative Minutes of the IEEE P802.11 Full Working Group**May 13 - 17, 2002****Wentworth Rydges Hotel, Sydney, NSW, Australia****Joint 802.11 / 802.15 Opening Plenary: Monday, May 13****1.1. Introduction**

- 1.1.1. Meeting called to order by Stuart Kerry and Bob Heile at 08:10. Agenda of 73rd session of 802.11 is in doc.: IEEE 11-02-278r4, including 802.15 and 802.18 RREG TAG.
- 1.1.2. Secretary – Tim Godfrey
- 1.1.3. Approximately 185 people in the room. 26 new people are present.

1.2. Announcements of policies and rules

- 1.2.1. Attendance Recording
 - 1.2.1.1. This meeting is fully electronic attendance recording.
 - 1.2.1.2. The procedures for electronic attendance is in document 02/160r1.
 - 1.2.1.3. Meeting IDs are new for each meeting.
- 1.2.2. Voting Tokens will be distributed by Al Petrick

1.3. General Information

- 1.3.1. Introduction of officers and functions
- 1.3.2. Voting Rights
 - 1.3.2.1. The chair reviews the voting rules detailed in document 00/278
- 1.3.3. 802.11 Voting membership status
 - 1.3.3.1. 346 voting members, 76 nearly voters, potential 422 voting members.
 - 1.3.3.2. We have grown 4X in the past two years.
- 1.3.4. 802.15 Voting membership status
 - 1.3.4.1. 90 members, 15 nearly members
- 1.3.5. The chair requests that members verify their email address.
- 1.3.6. Logistics
 - 1.3.6.1. Coffee Breaks and Lunch breaks each day.
 - 1.3.6.2. Social Evening sponsored by Motorola.
 - 1.3.6.3. There is a message board next to the registration desk
 - 1.3.6.4. Thanks to TourHosts for their efforts in organizing this meeting.
- 1.3.7. Patent Policy
 - 1.3.7.1. IEEE SA Standards Bylaws Clause 5 and 6 apply
 - 1.3.7.2. The chair asks for anyone with knowledge of applicable patents to notify the chair.
 - 1.3.7.3. Clause 6.3 and now also 6.6
 - 1.3.7.4. Review of individual membership.
 - 1.3.7.5. Anti-trust issues, and discussion of cost.

- 1.3.7.6. Cal for IP statements for 802.11 – none. For 802.15? None.
- 1.3.8. Interim Meetings
 - 1.3.8.1. Sept 2002, Monterey California. Hyatt Regency Monterey.
 - 1.3.8.2. January 2003, Ft Lauderdale, FL.
 - 1.3.8.3. Continuing to discuss a meeting with ETSI in Sophia Antipolis, France.
 - 1.3.8.4. Soliciting any other companies that wish to host a meeting.
 - 1.3.8.5. It has been 3 years since we met in Japan. Are there any companies that might be interested in hosting a meeting in Chiba Japan?
 - 1.3.8.5.1. Straw Poll of investigating another meeting in Chiba Japan? 77 For, 11 against, 20 don't care.
- 1.3.9. Financial Reports
 - 1.3.9.1. Report from Dallas Meeting
- 1.3.10. Report from ExCom SEC meeting in March
 - 1.3.10.1. Bob Heile presents 802.15 document 02/226r0
- 1.4. **Sub Group Reports**
 - 1.4.1. TGe – John Fakatselis
 - 1.4.1.1. We will focus on having a letter ballot start after this meeting. We have been pre-authorized by previous motions to issue a letter ballot. We have been resolving comments since the letter ballot of November 2001.
 - 1.4.1.2. We need to incorporate all the comment resolutions. We need help on the editorial effort, and have the draft ready by the end of the week.
 - 1.4.2. TGf – John Rosdahl
 - 1.4.2.1. Update from San Mateo Interim meeting. TGf is not meeting this week. There was an interim meeting in April.
 - 1.4.2.2. The agenda was set by the March Plenary – to complete LB32 comment resolutions. A 10 day Letter ballot, LB37, was conducted to enable issuing a recirculation Letter Ballot.
 - 1.4.2.3. LB32 Passed with 79% approval, but there were still comments to be resolved.
 - 1.4.2.4. This report in document 02/284r0.
 - 1.4.2.5. LB38 is the actual recirculation letter ballot of Draft 3.1
 - 1.4.2.6. Interim meeting Minutes in 2002/293r1
 - 1.4.2.7. The chair has received the IANA vendor IDs and port numbers. One of the three sets have been provided.
 - 1.4.2.8. Plans for July 2002 – review comments and start Sponsor Ballot.
 - 1.4.3. TGg – Matthew Shoemake
 - 1.4.3.1. Continue resolving comments and issue a letter ballot
 - 1.4.4. TGh – Mika Kasslin
 - 1.4.4.1. Report on letter ballot 260 votes, 133 yes.
 - 1.4.4.2. 600 comments have been received
 - 1.4.4.3. This meeting will start addressing comments, and discuss related regulatory issues with 802.18 TAG.
 - 1.4.5. TGi – Dave Halasz
 - 1.4.5.1. LB35 received 257 votes. 90 yes 112 no, 55 abstain. Preliminary results
 - 1.4.5.2. 02/295 contains the first round of comments. Over 1200 comments. We don't expect a new letter ballot at this meeting.
 - 1.4.6. WNG SC – Bruce Kraemer

- 1.4.6.1. We have 4 sessions this week. The posted agenda on the web site is the guide for Tuesday Morning's first session. We will make changes to the agenda for the rest of the week. TK had been in contact with several speakers, but we have not finalized the presentation plans. Presenters should coordinate with Bruce to get an agenda slot.
- 1.4.6.2. We have participation conflicts between TGg and WNG. We will try to adjust the schedule to accommodate. Radio Measurement will be moved to Wednesday afternoon, concurrent with TGg, and move High Data Rate and UWB to the 3:30PM slot when there is no meeting of TGg.
- 1.4.6.3. **802.15 TG1**
- 1.4.6.4. 802.15.1 was approved on April 15th by the IEEE SA Standards Board.
- 1.4.7. **802.15 TG2 – Coex – Steve Shellhammer**
 - 1.4.7.1. Result of 802.15 LB14 and 802.11 LB34. Neither LB passed. The group will assemble a database and process the comments.
- 1.4.8. **802.15 TG3 – John Barr.**
 - 1.4.8.1. LB12 editing and integration. Will address symmetric security suite, to follow TGi. Post-mortem on comment resolution handling.
 - 1.4.8.2. Considering using a ballot review committee.
 - 1.4.8.3. Just finished LB16 for security text which just closed last night.
- 1.4.9. **802.15 TG4**
 - 1.4.9.1. Initiate sponsor ballot
 - 1.4.9.2. LB15 results 76 votes results 64:6:6
 - 1.4.9.3. Timeline has been modified to support more recirculation.
- 1.4.10. **802.15 3A SG High Rate PHY - Rick Roberts**
 - 1.4.10.1. Issued a call for channel model proposals for UWB
 - 1.4.10.2. Call for proposals for alternate PHY to be presented in September meeting this year.
- 1.4.11. **Publicity – Al Petrick**
 - 1.4.11.1. Expecting update on N+I WECA meetings
 - 1.4.11.2. Will generate document on how TGs will report to publicity group.
 - 1.4.11.3. Roger Marks will be 802 contact to analysts.
 - 1.4.11.4.
- 1.4.12. **802.18 RREG TAG – Carl Stephenson**
 - 1.4.12.1. Report in 802.18 document 02/001r2
 - 1.4.12.2. Filed comments on support of WECA petition
 - 1.4.12.3. Participated in discussion with FCC on RF Lighting
 - 1.4.12.4. Collaborating on sharing studies.
 - 1.4.12.5. WARC 03 preparations on agenda 1.5 – 5GHz RLAN.
 - 1.4.12.6. Objectives – continue working on charter and rules changes.
 - 1.4.12.7. FCC NPRM ET02-98 – concern about elevating amateur to primary in 2.4GHz band.
 - 1.4.12.8. Prepare response to RF lighting challenges.
 - 1.4.12.9. Will hold joint meetings with 802.11 task groups. TGh, TGg, WNG.
- 1.4.13. **802 Coexistence – Jim Lansford**
 - 1.4.13.1. Trying to create TAG – refining mission statement
 - 1.4.13.2. Document Coex 02/16r2
 - 1.4.13.3. Goals – solicit broader feedback on forming this TAG.
 - 1.4.13.4. Feedback of definition of coexistence.

1.4.13.5. Prepare for motion at Vancouver Plenary to form the TAG.

1.4.13.6. Main meeting is scheduled on Wednesday 1 to 3

1.5. Overview of 802.16a – unlicensed band coexistence

1.5.1. Mike Kasslin on behalf of Roger Marks

1.5.2. Presentation in Document 02/249r1

1.5.3. Review of status of 802.16a. Standard specifies use in spectrum defined for use in 802.11a. Different MAC and different channelization than 802.11.

1.5.4. Provides DFS / TPC coexistence modes, based on 802.11 TGh.

1.5.5. Other coexistence methods are also provided, based on channel measurements.

1.5.6. 802.16a is developing wireless MAN systems for outdoors.

1.5.7. 802.16 is calling for proposals on how to proceed. There is a letter ballot open. They failed to get into sponsor ballot. They are trying to develop a better draft that would be accepted for sponsor ballot.

1.5.8. The report will be on the technical reflector.

1.5.9. The chair notes that the 802.11 chair was directed on how to vote on this issue.

2. 802.11 Opening Plenary, Monday, May 13

2.1.1. The session is called to order by Stuart Kerry at 10:00

2.1.1.1. 160 people are in the room.

2.2. Approval of the Agenda

2.2.1. Any old business, new business, discussion on the agenda? None

2.2.2. The agenda is approved as shown in r4

2.3. Approval of minutes from Dallas January meeting

2.3.1. 023r02 are approved without objection

2.4. Operating Rules Update

2.4.1. Update presentation in document 02/276r0

2.4.2. Current Rules in 00/331r2.

2.4.3. These changes have been suggested by the WG and the CAC has incorporated them into 00/331r3

2.4.3.1. Added section 4 on Standing Committees, and section 5 on voting rights.

2.4.4. Recommends that members review document 00/331r3. Any questions, see Al Petrick.

2.4.5. Will vote on this on Wednesday

2.4.6. Questions? None

2.5. Liaison Updates

2.5.1. Document 00/406r8

2.5.2. These people will bring reports to the closing plenary session

2.5.3. 11-15 Bruce Kraemer, Peter Murray.

- 2.5.4. Both Bruce and Peter wish to step down as Liaisons.
- 2.5.5. 15 to 11: Jay Bain
- 2.5.6. 11 to 16 – Mike Kasslin – will continue
- 2.5.7. 11 to 18 – Dennis Kuahara
- 2.5.8. 11/15 and ETSI – Jamshid
- 2.5.9. 11 and WECA – open slot
- 2.5.10. 11 and 1394 – Peter Johansson: will continue
- 2.5.11. 11 and JC16 – Benno Ritter (not present)
- 2.5.12. 11 and NIST – Simon Blake Wilson (not present)
- 2.5.13. 11/15 and Bluetooth SIG – Tom Seip.

2.6. Reflector updates

- 2.6.1. Reflectors have been down for a few days. Letter ballots 33 to 37 have been completed.
- 2.6.2. The Web Site is updated daily and will be the final source for information.
- 2.6.3. The reflector is fully closed – only our members can post. Al Petrick has to update members email addresses.
- 2.6.4. Members who post numerous virus alerts will be taken off the list until they resolve the problem.

2.7. Web Site Access

- 2.7.1. Members only section is available to “Nearly Voters”
- 2.7.2. Presentation in 01/462r5 .
- 2.7.3. If you attend meeting, you have free access to all documents on the servers.

2.8. Old Business

- 2.8.1. None

2.9. New Business

- 2.9.1. None

2.10. Recess for subgroups at 10:15

3. 802.11 Mid week Plenary, Wednesday, May 15th

3.1. *Opening*

- 3.1.1. The meeting is called to order at 10:40 by Stuart Kerry.
- 3.1.2. Following agenda in 11-02-278r4. R5 will contain any updates from this session
- 3.1.3. Carl Stephenson will join us at 11:25 with a motion. There is documentation on the server for this motion.

3.2. *Review of the agenda*

- 3.2.1. Any old or new business to be added to the agenda? None
- 3.2.2. Discussion on the agenda
 - 3.2.2.1. Will there be time to continue the work for TGe joint session? That is out of order for this meeting.

3.2.3. The chair moves to approve the agenda
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| 3.2.3.1. Vote on approving the agenda: The motion passes 107:0:2 |
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3.3. *Announcements*

- 3.3.1. The chair calls for any new IP statements
 - 3.3.1.1. No new IP statements
- 3.3.2. TGe joint session – The TGe/TGg joint session will continue at 1:00PM.
 - 3.3.2.1. The TGe and TGg chair ask the WG chair to allow the continuance of the joint session. The WG chair ask for objections, and there are none.

3.4. *Thursday AM CAC meeting*

- 3.4.1. Tomorrow at 7:00AM

3.5. *Attendance Recording*

- 3.5.1. Reminder to sign in with the electronic system.
- 3.5.2. The system seems to be working fine.

3.6. *Documentation*

- 3.6.1. The vice chair request the proper formatting and templates for documents.

3.7. *TGh Straw Poll*

- 3.7.1. Mika Kasslin, on behalf of TGh.
- 3.7.2. There have been long discussions on the PAR. Requesting guidance from the WG on issues.
- 3.7.3. Review of the TGh PAR.
 - 3.7.3.1. Currently covering 5GHz in Europe per CEPT regulations. It is only for Europe, no other regulatory domains.
 - 3.7.3.2. Now there have been suggestions to cover the whole world.
- 3.7.4. Straw Poll results from TGh
 - 3.7.4.1. Option 1 – leave the words “in Europe” in the title and PAR. 14 in favor
 - 3.7.4.2. Option 2 – change the TGh draft and PAR title to delete “in Europe” without changing the scope of the PAR: 2 in favor

- 3.7.4.3. Option 3 – revise the title and scope of TGh draft standard and PAR to address a global solution rather than focused on Europe. 3 in favor.
- 3.7.5. The WG chair reviews the process for changing an existing PAR and Scope. This could take 3 to 6 months.
 - 3.7.5.1. Discussion
 - 3.7.5.1.1. However this time could be concurrent in parallel with normal comment resolution of the Task Group.
 - 3.7.5.1.2. The title has to be changed before going to sponsor ballot. This may not slip the end date, depending on the schedule between now and the first sponsor ballot draft.
 - 3.7.5.1.3. Agrees that it is unfortunate that the words “In Europe” appear. However does the presence of those words change the standard, or the ability to use it elsewhere?
 - 3.7.5.1.4. The chair notes that these issues should be addressed in the Task Group, not here.
 - 3.7.5.1.5. The TG has debated this already. It is true that the words ‘In Europe” do not change the content of the standard.
 - 3.7.5.1.6. Is there a way we can create the supplement so it can allow international use, and still comply with the Europe primary focus. This straw poll seems black or white. Is there a compromise?
 - 3.7.5.1.7. The TG chair notes that this discussion should go on in the Task Group. This straw poll is to gather information to take back to the TG.
 - 3.7.5.1.8. Option 3 could change the scope and affect the work that has been performed
 - 3.7.5.1.9. Another option might be to leave it unchanged, and then later on create a new PAR.
- 3.7.6. Mika withdraws the request for a straw poll and will take the issue back to the Task Group
- 3.7.7. The group requests that the straw poll be taken anyway. It will consist of all people, not just voters.
- 3.7.8. Straw Poll in the working group.
 - 3.7.8.1. Option 1 – leave the words “in Europe” in the title of the TGh draft standard and associated PAR. 84 in favor
 - 3.7.8.2. Option 2 – change the TGh draft and PAR title to delete “in Europe” without changing the scope of the PAR: 9 in favor
 - 3.7.8.3. Option 3 – revise the title and scope of TGh draft standard and PAR to address a global solution rather than focused on Europe. 26 in favor

3.8. 802.11 Operating Rules

- 3.8.1. Review document presentation in document 02/276r0 as presented in St Louis. A summary of proposed changes.
- 3.8.2. It contains suggestions from members, which the CAC reviewed and edited the rules document to R3
- 3.8.3. R3 has been on the server from the last meeting.
- 3.8.4. Rev 2 is on the web site.
- 3.8.5. Sections 1,2,3,6,7,9 have been changed. Section 4 has been added.
- 3.8.6. Changes to voting rights rules were made.

- 3.8.7. Comments were received earlier this week. They will be considered as R4 at the next meeting.
- 3.8.8. Will make a motion to instate 01/331r3 as the operating rules.
- 3.8.9. Discussion
- 3.8.9.1. What is the time stamp of the official R3 version. The one on the server is not the exact one that is on the screen.
- 3.8.9.2. Time stamps are a difficult problem with servers. We are displaying the one that was presented at the close of the last session.
- 3.8.9.3. Today, the version on the web site is the official rules.
- 3.8.9.4. Are there any changes that are beyond what we have been able to review.
- 3.8.9.5. Wants to insure that the version on the server is exactly the same as the one being displayed and voted on. The vice chair says that the document on the screen is the one from the server.
- 3.8.9.6. There are 16 points, reasons not to forward these rules.
- 3.8.10. The vice chair yields to John Rosdahl, with 16 points regarding the rules in 331r3.
- 3.8.10.1. A presentation in 02-350r0.

Comments refer to submission “802.11 Oper. Rules11-00-331r3-W-11.doc”
New Rules Comments:

1. Page 7, Line 51: Semi-Annually reaffirmation is not necessarily the best period to use. As Plenary meetings should be the point of reaffirmation, and since plenary meetings are 3 times a year, keeping track of liaisons every other meeting is what is possibly implied. Tracking the Liaisons term should be spelled out. Latter on, (#5) it indicates that reaffirmation/confirmation is done at plenary and interim sessions. It may be a good thing to indicate here the semi-annual as well is that is the correct period.
2. Page 11, line 12: Either Remove “e. The roll call of current voters.” Or Mandate that the chair call roll for current Voters (Not roll call of those present, or statement that it is banished).
3. Page 12, line 2-4 remove “ Decisions at the Interim meetings can include Letter Ballot actions. The next plenary meeting can negate any Letter Ballot action taken by the Interim and declare any results as null and void.” (Letter Ballots are WG instruments, and as such, the full WG is voting, and a simple majority of an assembled group is not sufficient to reverse the majority of the WG in total.)
4. Page 12, Line 11: change from “the session may not adjourn, but will finished at the currently scheduled time,” to “the session may not be forced to adjourn, but will finish at the current scheduled time, or at the conclusion of business,”
5. Page 12, Line 15 and 16: remove both 3 and 4. The Letter ballot option is already specified in item 1. 40 day is a nominal time to provide sufficient time for reading and confirming minutes of the interim meetings. And to determine the ramifications of the results.
6. Page 8, section 2.5 the initial clause states that 802.11 docs are disseminated in electronic format, and only accepted if they adhere to the rules spelled out in clause 2.5. This is grand, but the text that was deleted was actually a valuable rule, and some form of it should be re-instated. Members should provide their submissions in the proper format prior to presentation or voting etc. The time specified of one hour is minimal at best, and

- should be an easy thing for us to discipline ourselves to achieve. Given that we now have electronic Doc Numbers etc, we should be requiring that ALL submissions be of the proper format prior to submission.
7. Page 9, Line 39; Section 2.5.3, The section should not be deleted. As there may be times that having the submission time be the discriminator to ensure those that have prepared ahead of time do get their fair share of time. It provides the Chair a deterministic way to provide fairness and helps preclude the appearance of prejudice to an individual's submission.
 8. Page 12, Line 30, Deletion of the requirement that letter ballots be complete with all technical issues closed should not be deleted. Having the Draft's being sent for Sponsor ballot without all the technical issues resolved is not a rational thing to do, and at best if we know that ballot will fail, we run the risk of causing the membership to ignore the full review, and merely find sufficient comments to support their "no" vote, and then wait to provide the remaining comments later. To get the most useful and meaning draft, a "Best effort" should be made to have the draft complete prior to sending out for review or to check for Sponsor Ballot readiness.
 9. Page 12, Section 2.8.2: I believe that Letter Ballots requesting that a draft move to Sponsor Ballot are Technical in nature, and as such require the super majority vote (75%). However, the last sentence of the "new a)" is contradictory, as it says procedural, after a 75% vote. The Draft should be ready and reviewed by the Task group prior to being presented to the WG. I think that is the step that we often miss. Having a TG review prior to having it be brought to the WG should be considered.
 10. Page 13, Line 17: The Vice chair that takes in comments on the rules needs to have a specified forum to be able to discuss the requested changes. Rules should be stable for a period of time, and as such, a time for change could be specified, (i.e. during even years or only after a vote of the membership or some such trigger).
 11. Page 13, Line 31: a statement that rule changes take immediate effect for option a and not for option b makes one wonder when option b changes would take effect? The statement "Any approved changes take immediate effect" is really ineffectual, as the rule change must be voted on at the closing plenary of an 802.11 meeting. The previous paragraph changed the 802.11 Plenary be either at the Interim Meeting or at the Plenary meeting. 802 does make a distinction, but I don't know that 802.11 maintains the real distinction in practice anymore.
 12. Page 15, Line 33: "The NOTE" is a sentence fragment and should be removed.
 13. Page 19, Line 33: as we now have 6 criteria, we should make a change here from 5 to 6. There are some other locations that we have need to update from 5 to 6 also.
 14. Page 22, Line 8: Letter Ballots are sponsored by either the WG or TG, so the statement on who should address comments should be changed from "and" to "or".
 15. Page 25, Line 12: the 6th criteria need to be added/inserted here.
 16. Page 26, Line 33: The line "Act as Parliamentarian using" was deleted, but the book/set of rules to use was left in, without the precursor, the remaining text doesn't make sense.

- 3.8.10.2. Discussion
 - 3.8.10.2.1. There is a lot here – each of these would require an amendment? What is the proposal to adopt these? Vote them one by one, or as a group?
 - 3.8.10.2.2. The chair suggest that a group could be formed to incorporate these changes into R3 and bring them back Friday.
- 3.8.11. The Vice chair notes that this is a living document. The chairs appreciate getting comments back when they are put on the server at a plenary meeting, not when they are up for adoption.
- 3.8.12. A clarification – the information is based on the status as of January, and some of these issues such as CAC review and 6th criteria were put in place in March.
- 3.8.13. Discussion
 - 3.8.13.1. All the bi-monthly meetings will become plenaries according to these rules? Yes. It is a good rules change, but are there problems with ExCom. Would they disagree?
 - 3.8.13.2. This has been discussed with ExCom, and there is 50/50 support. No decision has been made.
 - 3.8.13.3. If we voted on this particular section, we could be in violation of LMSC rules until they change.
 - 3.8.13.4. Also how would the change to all plenaries effect the voting rights process?
 - 3.8.13.5. Again, this is tied to LMSC rules, which would need to change accordingly.
 - 3.8.13.6. There is a concern about not being able to adjourn until the scheduled time. That could make a motion to adjourn out of order. We should reconsider that.
 - 3.8.13.7. It is clear that some have not had enough time to review them. Should rules changes be treated similarly to a technical ballot?
 - 3.8.13.8. That is possible – a 40 day letter ballot could be done with at 2/3 majority vote.
 - 3.8.13.9. We have an option to create an editing group and holding a vote on Friday.
 - 3.8.13.10. A quorum call on Friday might fail.
- 3.8.14. The chair suggests that Al Petrick work with a group of CAC and members and bring back a proposal for vote on Friday. (John Rosdahl, Terry Cole, Jim Zyren, John Kowalski will assist).
- 3.8.15. Any objection to form a working group to come back in the Friday Plenary.
 - 3.8.15.1. No Objections.
- 3.8.16. Those interested in the rules will meet after this meeting at 12:00.

3.9. **New Business**

- 3.9.1. Discussion of Opposition to the petition for reconsideration filed by the ARRL.

3.9.2. Motion: To approve document 18-02-002d1_IEEE_802_Opp_98-156.doc, as posted on the 802.11 meeting server PM Tuesday 05/14/02, as amended by 802.15 (d2 on Venus), for filing with the FCC, authorizing the Chair of 802.18 to add a cover letter and certificate of service, editorial reformat the document as appropriate

(remove IEEE 802 headers and footers), revise the document number to r0, and file electronically with the FCC on behalf of IEEE 802 (subject to SEC approval as per LMSC rules) prior to the filing deadline.

- 3.9.2.1. Moved Carl Stevenson
- 3.9.2.2. Second Peter Murray
- 3.9.2.3. Vote on the motion: Passes 69:0:22

3.9.3. Midweek report in Document 18-02-004

- 3.9.3.1. Discussed RF lighting – inband emissions limits are not good enough.
- 3.9.3.2. Charter and TAG rules
- 3.9.3.3. Will have joint meetings with TGG and WNG
- 3.9.3.4. Vancouver – expect SEC approval of .18

3.10. Recess at 12:00

4. 802.11 Closing Plenary, Friday, May 17, 2002

4.1. Opening

- 4.1.1. The meeting is called to order at 8:00AM by Stuart Kerry.
- 4.1.2. The chair reminds the members to sign the electronic attendance book, and asks chairs to announce it at the start of their sessions
- 4.1.3. The agenda is updated to r5.

4.2. Agenda Review

- 4.2.1. We have added in blue new items:
 - 4.2.1.1. IEEE sponsor ballot reaffirmation
 - 4.2.1.2. Sponsor ballot pool
 - 4.2.1.3. Reflectors
 - 4.2.1.4. Liaisons and nominations
 - 4.2.1.5. Fixed Time Slot items
 - 4.2.1.6. WNG SC motions for new Study Groups
 - 4.2.1.7. Operating rules
 - 4.2.1.8. New business – Assigned Numbers Authority
- 4.2.2. Discussion
- 4.2.3. Approval of the agenda –
 - 4.2.3.1. The agenda is approved without objections

4.3. Announcements

- 4.3.1. CAC Chairs committee – dates and times for teleconferences and due dates.
- 4.3.2. The chair calls for any IP statements – there are none.
- 4.3.3. Reaffirmation of IEEE 802.11
 - 4.3.3.1. We have four amendments to 802.11 that need to be rolled into one standard.
 - 4.3.3.2. The sponsor ballot pool is asked to re-affirm the content.
 - 4.3.3.3. <http://standards.ieee.org/db/balloting/ballotform.html>
 - 4.3.3.4. This page allows members to join the ballot pool.
 - 4.3.3.5. You have to be an IEEE member and SA member.
- 4.3.4. 802.11 reflector closures
 - 4.3.4.1. the WG requested the closure of the reflector due to spam and viruses. 802.11 and 802.11m reflectors are now closed except to members.

4.4. Document List Update

- 4.4.1. There are still a few documents with format problems, but overall, the members have done very well.

4.5. Closing TG Reports

- 4.5.1. TGe – John Fakatselis
 - 4.5.1.1. Report
 - 4.5.1.1.1. Continued with comment resolution from LB#30.
 - 4.5.1.1.2. Introduced new text for draft based on several technical presentations and motions.
 - 4.5.1.1.3. Approved Draft version 3.0 incorporating all approved changes since the November meeting.

- 4.5.1.1.4. Requesting permission to go to LB with draft 3.0.
- 4.5.1.1.5. We will hold ad-hoc teleconferences starting June 4, 2002 at 11:00 EST on the subject of FEC
- 4.5.1.2. Meeting Goals
 - 4.5.1.2.1. Resolve comment on the new Letter Ballot,
 - 4.5.1.2.2. Develop and approve an updated draft
- 4.5.1.3. Discussion
 - 4.5.1.3.1. Members wish to have the report on the server
- 4.5.2. TGf – John Rosdahl on behalf of Dave Bagby
 - 4.5.2.1. TGf didn't meet this week.
 - 4.5.2.2. A recirculation ballot is in process, which will close before July.
 - 4.5.2.3. TGf will resolve comments at the July meeting and submit to sponsor ballot in July.
- 4.5.3. TGg – Matthew Shoemake
 - 4.5.3.1. Have been resolving comments – 890 received,
 - 4.5.3.2. Comments are in document 02/209r10.
 - 4.5.3.3. About 30% of comments remain unresolved.
 - 4.5.3.4. There are about 173 remaining technical comments to resolve.
 - 4.5.3.5. Conference calls will be held on the 4 channel proposal subject.
 - 4.5.3.6. The TG passed a motion to direct the editor to update the draft to incorporate all comment resolutions so far. The number will be Version 2.8.
 - 4.5.3.7. There will be no motion to go to letter ballot.
 - 4.5.3.8. In July, comment resolution will continue, and hopefully issue an new LB.

May 17, 2002

doc.: IEEE 802.11-02/382r0

TGg Report to IEEE 802.11 WG

May 17, 2002

Matthew B. Shoemake
Task Group G Chair
m.b.shoemake@ieee.org

Submission

Matthew B. Shoemake, TGg Chair

May 17, 2002

doc.: IEEE 802.11-02/382r0

Submissions to TGg

- **802.11g Contention Period**, S. Choi, doc. 11-02-181r1
- **Slides to Assist with non-19 Comments**, doc. 11-02-299, Terry Cole
- **Slides to Assist with Joint Meeting**, doc. 11-02-300, Terry Cole
- **A More Efficient RTS/CTS Protection Mechanism**, doc. 11-02-301, Terry Cole
- **Dual precoding with FEC packets**, Doc. 11-02-325r0a, Chris Heegard
- **Spectral Control Issues**, doc. 11-02-347, Steve Halford
- **Adjacent Channel Results for Four Channels**, doc. 11-02-365, Steve Halford
- **Adjacent Cell Interference**, doc. 11-02-367, Mark Webster
- **4-Channel Special Committee Report**, doc. 11-02-368, Anuj Batra

Submission

Matthew B. Shoemake, TGg Chair

May 17, 2002

doc.: IEEE 802.11-02/382r0

Letter Ballot #33 Comment Resolution

- Received approximately 890 comments
 - Approx. 388 were editorial
 - Approx. 502 were technical
- Continued Worked on resolution of motions
 - See document 02/209r10

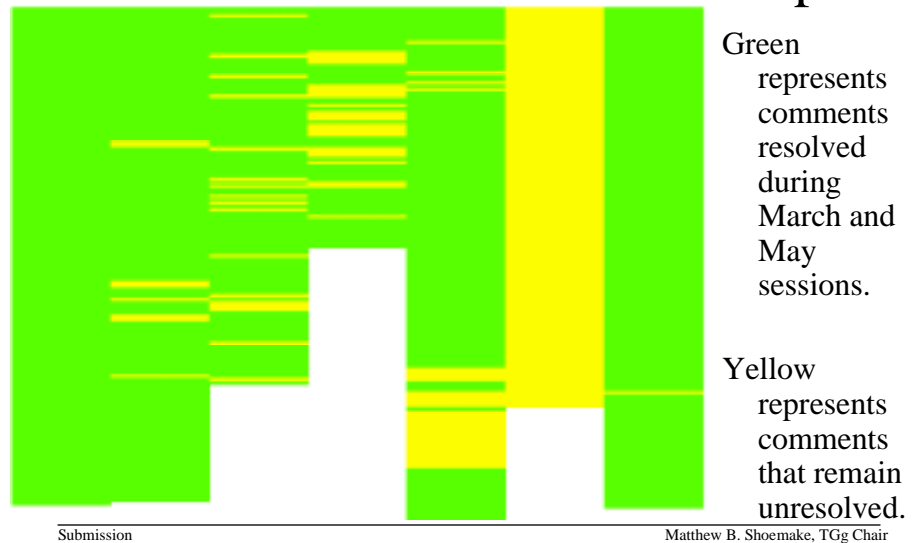
Submission

Matthew B. Shoemake, TGg Chair

May 17, 2002

doc.: IEEE 802.11-02/382r0

Comment Resolution Status Graphic



May 17, 2002

doc.: IEEE 802.11-02/382r0

Comment Resolution

- 173 (mostly technical) comments remain to be resolved
- Known major topics to be resolved:
 - Multirate support and control response frames
 - Scrambling for FEC
 - IBSS support
 - 4 channel support
 - Slot times
 - Spectral mask
 - Adjacent channel rejection
 - Protection mechanisms for OFDM frames
 - Minimum sensitivity specifications

Submission

Matthew B. Shoemake, TGg Chair

May 17, 2002

doc.: IEEE 802.11-02/382r0

Conference Calls

- Empowered a special committee to continue conference calls to address technical issues related to addition of an additional channel in the 2.4 GHz band and report during the July 2002 session.

Submission

Matthew B. Shoemake, TGg Chair

May 17, 2002

doc.: IEEE 802.11-02/382r0

State of the Draft

- Move to direct editor to produce an updated draft of IEEE 802.11g immediately following the May 2002 session with revision marks from Draft 2.1. The editor may insert editors notes to draw attention to items that may change. The draft shall only reflect the motions and resolutions that have been adopted.
- Cole/Smart – Passed in TGg

Submission

Matthew B. Shoemake, TGg Chair

Objectives for July 2002

- Continue resolution of LB #33 comments
- Update TGg Draft to include all resolutions to LB #33 comments
- Issue letter second 802.11g ballot

4.5.4. TGh – Mike Kasslin

- 4.5.4.1. Resolved more than half of the comments on LB36.
- 4.5.4.2. Revised draft has been posted to the server.
- 4.5.4.3. Decided to keep the PAR as it is – not removing “Europe”
- 4.5.4.4. Comment resolution will continue in conference calls.
- 4.5.4.5. At the July meeting, comment resolution will continue.
- 4.5.4.6. Plan to start recirculation ballot with the revised draft.

TGh Report to the Closing Plenary

Mika Kasslin
TGh chair

TGh Agenda (02/306)

- 11 meeting slots reserved, finally used 10 of them
 - A joint meeting with 802.18 TAG
 - LB#36 comment resolution
 - LB#36 results: 140 Yes, 77 No, 53 Abstain
- Meeting minutes in 02/330

Joint Mtg with 802.18 TAG

Update on WRC 2003 preparations under agenda item 1.5

- No changes in the basic DFS framework
 - The whole mechanism still under study
- DFS sharing studies in BRAN and WECA
 - Good contacts through individual TGh delegates participating the ad-hoc calls

Discussion on proposed TGh PAR changes

LB#36 Comment Resolution

- Comments and preliminary comment resolutions in 02/305r6
 - 676 comments in total
 - 426 discussed
 - Most of them resolved (resolution wording still preliminary)
 - Few comments for further consideration (e.g. action frame format)
 - Major decision:
 - No changes to the TGh PAR title and scope

Preparations to the July 2002 Mtg

- Revised draft normative text available in two weeks
- Discussion on unresolved comments will continue in TGh ad-hoc calls
 - Wednesdays, June 5th, 19th and July 3rd at 12:30pm PDT for 1.5 hours
 - Call-in number: 408-902-7870, 866-902-7870 (outside 408 area code)
 - ID: 87654321
 - 15 ports, call name 802.11h

July 2002 Objectives

- Update on progress in related matters (jointly with 802.18 TAG)
 - BRAN plans to finalise the harmonized standard, EN 301 893, in BRAN#29
- Resolve the open comments
- Start re-circulation ballot with the revised draft
 - If we get at least 23 No votes to Yes votes

4.5.5. TGi – David Halasz

- 4.5.5.1. Made a “transient security network”
- 4.5.5.2. Made a first pass on letter ballot comments.
- 4.5.5.3. Conference calls have been set up.
- 4.5.5.4. Coordination of 802.11i with 802.1. Requesting liaison with 802.1
- 4.5.5.5. Next meeting will continue letter ballot resolution
- 4.5.5.6. The WG chair asks for executive summary and next meeting objectives.

TGi Final Report for the May 2002 Session

May 16, 2002

TGi Final Report for the March 2002 Session

- Motions
 - Incorporate 02/298 except section 1.4.2: Passed
 - Create Transient-Security Network (TSN), as an RSN that also supports pre-RSN equipment:
Passed
- Made 1st pass of LB35 comments
- Conf. Call on May 29th & June 26th, 11-1 EDT, dial in number will be provided later on the reflector. Purpose is to discuss letter ballot comments.
- Request for 802.11i TG chair to be liaison to 802.1

Slide 2

David Halasz, Cisco Systems, Inc.

Next meeting objective

- Letter ballot resolution

Slide 3

David Halasz, Cisco Systems, Inc.

4.5.6. WNG – Harry Worstell on behalf of Bruce Kraemer

- 4.5.6.1. Report in document 352
- 4.5.6.2. Completed objectives
- 4.5.6.3. New Study Group HTSG
- 4.5.6.4. Organize HTSG and Radio Measurement SG
- 4.5.6.5. Discussion
 - 4.5.6.5.1. Is the organized formation of two SGs in the jurisdiction of the SG, or the WG? Agree that is an objective of the Working Group.
 - 4.5.6.5.2. Is there an intention to have a letter ballot to form the SG?
 - 4.5.6.5.3. This will be addressed in the new business area.

May, 2002

doc.: IEEE 802.11-02/352r0

WNG SC
IEEE 802.11, Sydney, NSW
May 13-17

Bruce Kraemer
Garth Hillman

Submission

Slide 1 Bruce Kraemer, Intersil Garth Hillman, AMD

Sydney Objectives

- ✓ Status review: St Louis, BRAN #28, MMAC
- ✓ High Throughput Extensions to 802.11
 - ✓ Consider study group formation
- ✓ Radio Resource Measurement
 - ✓ Consider study group formation
- ✓ UWB update
- ✓ Near term/ long term – BRAN & MMAC coordination
- ✓ WWAN/WLAN integration
- ✓ Joint regulatory meeting

Session Summary

- 19 presentations on range of subjects
- 2 Motions passed in committee to request formation of new study groups
 - Radio Resource Measurement
 - High Throughput

May, 2002

doc.: IEEE 802.11-02/352r0

HTSG (High Throughput SG) WNG Motion

Move to form a new IEEE 802.11 Study Group called the High Throughput Study Group (HTSG), to investigate the feasibility of providing throughputs greater than the existing 802.11 standard. Upon confirmation of feasibility and per 802 operating rules, the HTSG shall draft a PAR and 6 criteria to be submitted to the 802.11 WG.

With the first HTSG meeting starting not earlier than September 2002 session

Yes: 44

No: 1

Abstain: 0

Submission

Slide 4 Bruce Kraemer, Intersil Garth Hillman, AMD

May, 2002

doc.: IEEE 802.11-02/352r0

Radio Measurement – WNG Motion

Move to request the WNG Chair to request the 802.11 Working Group to form a Study Group for the purposes of writing a PAR and criteria to address Radio Resource Measurements to amend the published IEEE 802.11 Standard.

Yes: 54

No: 4

Abstain: 6

Submission

Slide 5 Bruce Kraemer, Intersil Garth Hillman, AMD

May, 2002

doc.: IEEE 802.11-02/352r0

Call for Study Group Officers

Candidates for Officer positions in the proposed Study Groups
Radio Measurement
and
High Throughput

Are requested to submit their names to WG Chair, Stuart Kerry
prior to the July meeting.

Confirmations will be completed during the 802.11 opening
plenary meeting Monday July 8 pending approval by ExCom
Monday morning.

Submission

Slide 6 Bruce Kraemer, Intersil Garth Hillman, AMD

May, 2002

doc.: IEEE 802.11-02/352r0

July Session Plans (Vancouver)

- Organize formation of Radio Measurement Study Group
- Organize formation of High Throughput Study Group
- Review results of BRAN #29
- Response to MMAC Liaison letter
- Response to ETSI Interworking request
- Cable Labs Liaison
- Scope of WNG activities
- Long term WLAN requirements
 - MAC revisions
 - Coordination with ETSI/MMAC
 - Radio Regulations

Submission

Slide 7 Bruce Kraemer, Intersil Garth Hillman, AMD

May, 2002

doc.: IEEE 802.11-02/352r0

WNG SC - Executive Summary - Sydney

Summary of the Wireless LAN Next Generation Standing Committee meetings held during the IEEE 802.11/15 Interim meeting in Sydney from May 12 through 16, 2002.

14 Presentations were made on topics ranging from OFDM-HDR, WWLAN-WWAN-WPAN Interworking, UWB, Radio Resource Measurement, Multi-hop, High Data Rate WPANs

Two motions to request the WG to form new study groups were passed:
 to form a new IEEE 802.11 Study Group called Radio Resource Measurement
 to form a new IEEE 802.11 Study Group called the High Throughput Study Group

An invitation from the ETSI BRAN chair to participate in joint Wireless Interworking Group (WIG) meetings starting in September at Monterey was received. WNG, in conjunction with WG11 and WG15 chairs will continue to discuss and consider formal response to ETSI invitation to participate in joint Wireless Interworking Group (WIG) meetings starting in September at Monterey.

Outstanding action item from previous meeting was noted:
 The WNG SC request the 802.11 WG to form a liaison with Cable Labs for the purpose of coordinating the use of 802.11 WLANs in DOCSIS cable modem systems. (64,0,4)

Submission

Slide 8 Bruce Kraemer, Intersil Garth Hillman, AMD

4.5.7. Publicity Ad Hoc – Al Petrick

- 4.5.7.1. Report is document 375r0
- 4.5.7.2. WECA update
- 4.5.7.3. Publicity channels – Roger Marks is point of contact for IEEE publicity activities.
- 4.5.7.4. Other activities – trying to be more proactive. Considering setting up a workshop on 802.11/15.
- 4.5.7.5. Asking for every chair to provide a 100 word summary of activities for publicity, analysts, and the web site.

May 2002

IEEE doc: 11-02-375r0

Publicity Committee 802.11/15

Al Petrick, 802.11/15

For

Brian Mathews, Chairman 802.11

Jim Meyer, Chairman 802.15

Submission

Slide 1

Al Petrick-IceFyre

Meeting Objectives

- Report from the WECA N+I Conference
- Joint 802.11/.15 Publicity committee New Activities
- Continue work on document describing procedure for Task Group Chair Reporting
- Update Conference Calendar
- Media Analyst update
- Summary reporting press releases for media analysts

 - Reviewed and completed

Publicity Committee

- Chartered as a joint ad-hoc group under the chairs of 802.11 and 802.15 to generate a common theme and joint publicity documents, press announcements, recommendations to the WG, IEEE etc...of the technical accomplishments, and issues resulting from the interim and plenary sessions as well as address external issues which are directly related to the development of 802.11 and 802.15 standards.
 - This information is posted on the 802.11/.15 websites
 - Used by the WG chairs and vice-chairs for communication to media, press and media analysts, IEEE staff and affiliated industry bodies
- Everyone can vote and participate in straw polls, motions, debates and discussions
- Don't forget to sign in...Electronic Attendance!

WECA

- Successful tradeshow at N+I, Las Vegas
 - Interviews with 20 media and analysts
 - 12 companies participating in pavilion
 - Areas of primary interest
 - Wi-Fi5
 - Security
 - Wi-Fi in hot spots
- Wi-Fi5 (802.11a) interoperability testing has started
 - Two independent silicon solutions now available
 - Second round of interoperability testing to be completed at end of May
 - Anticipate test bed in place by July and formal certification starting closely thereafter
- Next Member's meeting June 17 – 20, Miami, FL
- Next Trade Show – July 1 – July 5, N+I Tokyo
- Over 320 certified products and growing steadily

IEEE Publicity Channel

- At the March 2002 St Louis IEEE Plenary session
 - Roger Marks 802.16 was appointed as the point of contact between IEEE MarCom staff and ALL IEEE 802 working group publicity activities
 - Funnel Press inquires to respective WG chairs and Publicity Chairs
 - Objectives include consolidating WG interim and plenary closing reports for IEEE staff access as needed for media interviews
 - Weekly, Monthly, specialty trade journals, technical analysts, and Wall Street and industry media analysts
 - Planning to set up regular quarterly analyst briefings on standards developments

Other Activities

- Reviewed conference calendar and media analyst list
 - Group suggested that keep short list of key events
 - Set up website links between 802.11 an appropriate trade publications sites
 - Group suggested that we obtain a exhausted media list from the IEEE staff – NJ and WECA for analyst briefings
- Proactive Publicity
 - Investigate the possibility of coordinating a All day multi-track workshop on the “Developments in 802.11/.15 standards” at future conferences aligned with WECA and other industry bodies
 - Intention is have representation and “experts” from each TG give an overview of the latest development
- Real time activity reporting
 - Group suggested that we have each of the Task Group chairs going forward complete 100 word summary of the accomplishments for the week.
 - This would be used for WG Chairs and WG Vice-Chairs to brief analysts following the close of plenary
 - Concise WG minutes update

Meeting Objectives for July

- Report from the WECA N+I Conference
- Joint 802.11/.15 Publicity committee New Activities...meet with IEEE 802 staff
- Investigate Future IEEE 802.11 Work Shop event
- Media Analyst update
- Summary reporting press releases for media analysts

Summary of Activities May 2002

- IEEE 802.11/.15 Ad-Hoc Publicity Committee
 - May 12-17, 2002 – Sydney Australia
 - Summary of Activities and Future Plans
 - The Publicity Committee (PC) held one meeting for the week of May 12, 2002. chaired by Al Petrick from 802.11 acting for Brian Mathews PC Chair 802.11 and Jim Meyer PC Chair for 802.15. Dennis Eaton WECA chair provided information on the highlights from the WECA event at N+I. Now that 802.11a silicon is available from a 2nd supplier, WECA is starting interoperability testing on 5GHz 802.11a products. WECA expects to start formal certifications beginning in Q3-02. The PC reviewed the calendar of events and media analyst list. It was recommended that the PC align with WECA and IEEE staff to coordinate such activities. The group also discussed in detail the possibility of hosting an all day “IEEE 802.11/.15 Standards Workshop” in conjunction with with future WLAN conferences.
- At the IEEE 802 Plenary session in July the PC plans to continue working joint activities between 802.11 and 802.15 and generate an outline for the standards workshop.

4.6. Reports from Liaisons

4.6.1. 802.11 to 802.1

- 4.6.1.1. David Halasz is prepared to take this position, as it is closely related to 802.11i.
- 4.6.1.2. The WG chair nominates David Halasz for this position.
- 4.6.1.3. Any other nominations? None
- 4.6.1.4. The body accepts David Halasz as the liaison by unanimous consent.
- 4.6.1.5. Report
 - 4.6.1.5.1. There is a meeting in Scotland next week, David will attend.

4.6.2. 802.11 and 802.15

- 4.6.2.1. Michael Seals – document 379
- 4.6.2.2. TG2 status – spend most time in comment resolution. TG2 wants to approach TGe to make necessary MAC changes.
- 4.6.2.3. TG3 status – have resolved 1851 comments from LB12. They adopted an 802.11 document for AES encryption for encryption and integrity. Will complete draft 10 and start a recirculation ballot by June 7th.
- 4.6.2.4. TG4 got results form LB15. Will work on security and coexistence. Will begin recirculation ballot.

May 2002

doc.: IEEE 802.11-02/379r0

Project: IEEE P802.11 Working Group for Wireless Local Area Networks (WLANs)

Submission Title: 802.15 Liaison Report, May 2002

Date Submitted: 17 May 2002

Source: Michael Seals, Intersil
Address 2401 Palm Bay Rd NE, Palm Bay, FL 32905
Voice: 321 724 7172, FAX: 312 724 7094, E-Mail: mseals@intersil.com

Abstract: This document highlights the actions taken by the IEEE 802.15 WG during the May 2002 Interim meeting in Sydney, Australia

Purpose: Liaison report

Notice: This document has been prepared to assist the IEEE P802.11. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.

Release: The contributor acknowledges and accepts that this contribution becomes the property of IEEE and may be made publicly available by P802.11.

Submission

Slide 1

M. Seals, Intersil

May 2002

doc.: IEEE 802.11-02/379r0

TG2 Status

This Week

- 802.15 LB 14 Results
36Y / 21N / 18A 63% Approval
- 802.11 LB 34 Results
130Y / 57N / 78A 70% Approval
- Began comment resolution from the two letter ballots
- A majority of LB 34 comments addressed 802.11 MAC changes to necessary support AWMA (alternating wireless medium access)
 - TG2 is approaching TGe to address this issue

Next Steps

- Continue comment resolution

Submission

Slide 2

M. Seals, Intersil

May 2002

doc.: IEEE 802.11-02/379r0

TG3 Status

This Week

- All 1851 LB 12 comments have finally been addressed
- Adopted 11-02-001r0 "AES Encryption & Authentication Using CTR Mode & CBC-MAC" (AES-CCM) as baseline text for symmetric key encryption and integrity

Next Steps

- Draft 10 to be complete June 6
- 20-day recirculation ballot to begin June 7
- Complete sponsor ballot pool selection
- Prepare a white paper on coexistence based on Annex D of the draft

Submission

Slide 3

M. Seals, Intersil

May 2002

doc.: IEEE 802.11-02/379r0

TG4 Status

This Week

- LB 15 Results (recirculation ballot)
93% Approval 85% Participation
- Comment resolution focused on
 - Security
 - Maintaining coexistence efforts

Next Steps

- Complete edits to draft 15, including adding security
- Begin recirculation ballot on June 10
- Anticipate sponsor ballot after July Meeting

Submission

Slide 4

M. Seals, Intersil

May 2002

doc.: IEEE 802.11-02/379r0

SG3a Status

General

- This SG is exploring alternative PHYs to the 2.4 GHz PHY in the TG3 draft
- Current requirements call for
 - 110 Mbps at 10 m
 - 200 Mbps at 4 m

This Week

- Continued work on
 - PAR and 6 Criteria
 - Technical Requirements
 - Selection Criteria

Next Steps

- Continue refinement of the documents cited above
- UWB channel model proposals due June 24
- Progress is dependent upon the approval of the TG3 MAC

Submission

Slide 5

M. Seals, Intersil

4.6.3. 802.11 to 802.18

4.6.3.1. Dennis Kuahara is not at this meeting.

4.6.3.2. The chair of 802.18 will present

4.6.4. TG3 and TGe

4.6.4.1. Jay Bain

4.6.4.1.1. No Report

4.6.5. TG3 to TGg

4.6.5.1. No report

4.6.6. 802.16 to 802.11

4.6.6.1. Mike Kasslin

4.6.6.1.1. report in document 364r0

4.6.6.1.2. TGa PHY and MAC amendments

4.6.6.1.3. Coexistence group

4.6.6.1.4. New SG to meet on mobile broadband wireless access

4.6.6.1.5. 802.16 interim next week in Calgary.

4.6.6.1.6. TGa amendment to base standard to new PHYs targeted for licensed bands 2 – 11 GHz, including Middle and upper UNII bands.

4.6.6.1.7. They have a call for contributions on coexistence.

4.6.6.1.8. The chair requests a quick synopsis on the reflector to 802.11. Mika will do that and prepare a few slides.

802.16 Liaison Report

Mika Kasslin

802.16 Liaison to 802.11

IEEE 802.16: Overview

- Working group developing interoperable air interface standards for Fixed Broadband Wireless Access Systems (FBWA)
 - Known also as WirelessMAN™ group
- The "base" standard published early this year
 - MAC and PHY for fixed point-to-multipoint BWA systems
 - Tailored for 10-66 GHz licensed bands

IEEE 802.16: Activity

- Four ongoing activities
 - TGa – PHY&MAC amendments
 - Two former task groups (TG3 and TG4) merged together
 - Addresses both licensed and unlicensed bands between 2-11 GHz
 - Original TG4 PAR for unlicensed bands excluded deliberately the 2.4 GHz ISM band
 - TG2 – Co-existence group
 - Recommended practice for coexistence of BWA systems
 - RP for 10-66 GHz published 2001
 - Currently addressing 2-11 GHz (primarily licensed bands)
 - TGc – Profile task group for 10-66 GHz
 - Study Group on MBWA
- Interim meeting next week 20-24 May in Calgary, Canada

IEEE 802.16a: Overview

- Amendment to the "base" 802.16 standard
 - Medium Access Control Modifications and Additional Physical Layer Specifications for 2-11 GHz
 - The latest draft D3 available since late March 2002
- The resulting standard specifies the air interface of fixed (stationary) broadband wireless access systems and applies to systems operating between 2 and 11 GHz, where such systems are permitted
- Targeted unlicensed frequency bands include 5.25-5.35 GHz and 5.725-5.825 GHz

IEEE 802.16a: Activity

- The plan:
 - May 02 interim: Revise the draft and start new WG letter ballot
 - July 02: Resolve comments and start Sponsor Ballot with the revised draft
- How to implement that?
 - Pending call for contributions to fix the holes in the TGa draft D3.0
 - Submission deadline today, May 17
 - So far some contributions addressing co-existence in LE bands (e.g. MAC frame structure)

Friendly Reminder

Download the revised TGa draft after the Calgary interim, review it, and feel free to provide comments

4.6.7. 802.11 and 802.15 to ETSI

4.6.7.1. Jamshid

4.6.7.1.1. No Report

4.6.8. 802.11 and WECA

4.6.8.1. Bill Carney

4.6.8.2. have submitted name as liaison, and participates in WECA. Looks for opportunity to coordinate message.

4.6.8.3. Any objection to nominate Bill Carney and Sheung Li as the WECA liaisons – none.

4.6.9. 802.11 and 1394

4.6.9.1. Peter Johansson Chair, IEEE P1394.1
Congruent Software, Inc.
98 Colorado Avenue
Berkeley, CA 94707
(510) 527-3926
(510) 527-3856 FAX
PJohansson@ACM.org

IEEE P1394.1 Status

* P1394.1 Draft 1.0 passed sponsor ballot

Approved, but significant technical comments

* P1394.1 Ballot Resolution Committee has met three times since ballot

Provisionally resolved 364 comments out of original 517

153 unresolved comments remain

* Next BRC meeting June 13 - 14

* Recirculation Sponsor Ballot this year

IEEE P1394.1 INFORMATION

* Working group reflector
STDS-1394-1@IEEE.org

Go to IEEE-SA web pages to sign up

* Working group web page

<http://grouper.ieee.org/groups/1394/1/index.html>

* Working draft

http://grouper.ieee.org/groups/1394/1/Drafts/D01_02.pdf

Username "P1394" / Password "High-Perf"

- 4.6.10. 802.11 to JEDEC JC61
 - 4.6.10.1. Benno Ritter
 - 4.6.10.1.1. Document 377
 - 4.6.10.1.2. Last meeting in Newport Beach CA, 22 companies discussed MRD and TRD.
 - 4.6.10.1.3. Discussed MAC PHY interface
 - 4.6.10.1.4. Achieved status of MRD and TRD into ballot.
 - 4.6.10.1.5. Next meeting in Boulder CO June 4-6 to discuss outcome of ballots.
 - 4.6.10.1.6. Tutorials from module manufacturers and connectors companies.
 - 4.6.10.1.7. Will address comments on MRD at next meeting.
 - 4.6.10.1.8. Interface ballots passed, but comments will still be resolved.
 - 4.6.10.1.9. There was concern about an article in SBN about the relationship between IEEE and JEDEC. This issue was resolved quickly. The two bodies see their efforts as complementary, not competitive.
 - 4.6.10.2. Discussion
 - 4.6.10.2.1. What were the exact counts of the votes?
 - 4.6.10.2.2. There were 16 companies on the ballot. 2 to 3 companies have voted no. Membership in JEDEC is by company, with one vote per company.
 - 4.6.10.2.3. Is there a list of voting member companies.
 - 4.6.10.2.4. There will be a revision to the report document with this information.
 - 4.6.10.2.5. There are 32 member companies of JC61

Liaison Report JEDEC JC-61

Benno Ritter
Philips
May 17th 2002

Status

- Last meeting in Newport Beach, CA in April
 - 22 participating companies
- Next meeting in June 4th – 6th in Boulder, CO
 - www.jedec.org, benno.ritter@philips.com
- MRD and TRD ballots closed for both RF-BB and MAC-PHY interface
- Procedure ballot JC-61-02-134 underway, closing date 05/29/02

MRD Ballot Results

- RF-BB Interface, passes
 - JC-61 TRD ballot 99: passed by 92%
 - JC-61 TRD ballot 100: passed by 85%
 - JC-61 TRD ballot 101: passed by 92%
- MAC-PHY Interface, passes
 - JC-61 TRD ballot 95: passed by 86%
 - JC-61 TRD ballot 96: passed by 86%
 - JC-61 TRD ballot 97: passed by 85%
- Between now and next meeting start with comment resolution

TRD Ballot Results

- RF-BB Interface, passes
 - JC-61 TRD ballot 106: passed by 81%
 - JC-61 TRD ballot 107: passed by 87%
 - JC-61 TRD ballot 108: passed by 85%
- MAC-PHY Interface, passes
 - JC-61 TRD ballot 103: passed by 73%
 - JC-61 TRD ballot 104: passed by 80%
 - JC-61 TRD ballot 105: passed by 85%
- Between now and next meeting start with comment resolution

PR Issues

- Article in SBN in March has raised concerns about the relation between IEEE and JEDEC
- Relation was clarified by the 502.11/15WG and JC-61 committee chairs together to the press
- JC-61 sees it's activity as a complement and support effort to IEEE

JC-61 Committee

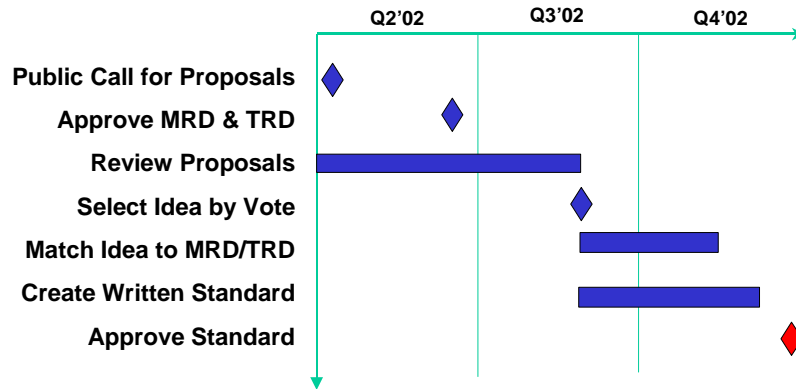
Founding Members: ALi, AMD, Conexant, HP, Mitsubishi, Philips

Officers:	Benno Ritter (Philips)	Chairman
	Larry Arnett (Mitsubishi)	Vice Chairman
	Patrick Yu (ALi)	Mrkt. Task Group Chairman
	Tim Wakeley (HP)	Tech. Task Group Chairman

Member Companies (May, 2002, total 32)

Acer Labs	HP	NewLogic
Agere	IBM	Nvidia
Apple	InProComm	Philips
AMD	Infineon	RF Magic
Analog Devices	Intel	RF Micro Devices
Broadcom	Intersil	Ralink
Cirrus Logic	Lucent	SOISIC
Compaq	Mitsubishi	Spirea AB
Conexant	Molex	Tality UK
Global Communications	Motorola	Texas Instruments
Helic	National	

Proposed Timeline



How to join JC-61

- Yearly Membership fee : \$4000 per year
- Membership is by company
- Call:

Arlene Colier
Sr. Coordinator, JEDEC
Arlenec@eia.org
703-907-7534
703-907-7583 (fax)

Benno Ritter
JC-61 Chairman
Benno.ritter@philips.com
408-474-5116

- 4.6.11. 802.11 / NIST
 - 4.6.11.1. Shawn Blake Wilson
 - 4.6.11.1.1. Not present
- 4.6.12. 802.11/15 to Bluetooth SIG
 - 4.6.12.1. Tom Seip
 - 4.6.12.1.1. Not present
- 4.6.13. 802.11 to CableLabs
 - 4.6.13.1. Nominations- currently only Lior Ophir
 - 4.6.13.2. Accepted by acclamation
- 4.6.14. 802.18 report
 - 4.6.14.1. Carl Stephenson
 - 4.6.14.2. Document 18-02-007
 - 4.6.14.3. Got approval to oppose ARRL petition
 - 4.6.14.4. ET document 02-98 comments
 - 4.6.14.5. The WG chair notes that he and the 802.15 chair have reviewed the documents generated by 802.18

May 2002

doc.: IEEE 802.18-02/007r0

Closing report 802.18 RR-TAG to Radio Working Groups May 2002 meeting

Carl R. Stevenson

Interim Chair, 802.18 RR-TAG

<http://ieee802.org/Regulatory/>

\\Neptune\RadioReg\2002_May

Progress to date at this meeting (1)

- Drafted Opposition to the Petition for Reconsideration by the ARRL in ET Docket No. 98-156 (18-02-002d1_IEEE_802_Opp_98-156.doc)
- Posted draft to 802.11 and 802.15 servers, PM Tuesday, May 14, for review
- Prepared Mid-week report and WG motions seeking approval to file the Opposition with the FCC, subject to SEC approval

Progress to date at this meeting (2)

- Discussed strategy for drafting comments on anticipated Report and Order from FCC on RF Lighting at 2.4 GHz (major interference potential to 802.11b, 802.15.1, 802.15.3, 802.15.4)
 - R&O has not been released, so we have no definitive knowledge of its provisions
 - Indications from FCC OET are that there will be some in-band emissions limits on RF Lighting, but that Part 15 interests may not be completely happy with the permitted levels
 - Also, there seems to be strong push-back from RF Lighting interests against confining their emissions to the upper part of the band
- Only recourse if we don't like the results is to file a Petition for Reconsideration ... however this must be done within 30 days of the publication of the R&O in the Federal Register
 - Since the R&O is expected "soon" interested parties may well have to file as individual companies or groups of companies (IEEE 802 probably won't be able to meet the filing deadline if it falls between now and the close of the July meeting)

Progress to date at this meeting (3)

- Secured approval from both 802.11 and 802.15 of Opposition to the Petition for Reconsideration by the ARRL in ET Docket No. 98-156 (18-02-002d1_IEEE_802_Opp_98-156.doc)
- Held joint meetings with TGh, TGg, and WNG SC
- Prepared Closing report and WG motions seeking approval to file the Comments with the FCC, subject to SEC approval

Progress to date at this meeting (4)

- Drafted comments on ET Docket No. 02-98 (NPRM text became available Thursday PM)
 - Proposes to elevate the Amateur Radio Service to PRIMARY at 2400-2402, and, perhaps more significantly, to add a PRIMARY allocation to the Amateur Satellite Service in the same band.
 - This could give the ARRL more “traction” in making assertions of (“real” or “potential) interference from 802.11b systems
 - 802.18 believes comments are warranted, your support would be greatly appreciated
- Posted draft to 802.11 and 802.15 servers, PM Thursday, May 16, for review

Output documents produced

- Opposition to ARRL Petition for Reconsideration in ET Docket 98-156
- Comments in response to NPRM in ET Docket 02-98

Objectives for Vancouver

- Gain SEC approval of 802.18 TAG Charter
- Present SEC with TAG rules change proposals and pursue the rules change process within SEC
- Seek TAG affirmation of Chair for 2 year term
- Report on regulatory issues of interest
- Draft and seek approval of any necessary filings with regulatory agencies

- 4.6.15. 802 Coexistence
 - 4.6.15.1. Jim Lansford
 - 4.6.15.2. coex-017 presentation: Document are on MARS, Coex Folder

May 2002

doc.: IEEE COEX 02/020r0

IEEE 802 Wireless Coexistence Study Group

Jim Lansford
Jim.Lansford@mobilian.com
Tim Blaney
tim@commcepts.net

Sydney Closing Summary

Docs on: \\mars\Documents\Sydney Documents\802coex-Sydney

Meeting minutes from this week are in doc: COEX 02/017r0

Submission

Slide 1

Jim Lansford, Mobilian Corporation

May 2002

doc.: IEEE COEX 02/020r0

Goals for Sydney meeting

- Review SEC conference calls
 - Broader feedback
 - Further refinement of mission statement and goals
 - Finalize mission statement
 - Proposed definition of coexistence
 - Prep for Vancouver plenary

Submission

Slide 2

Jim Lansford, Mobilian Corporation

Proposed Mission Statement

- The IEEE 802 Coexistence Technical Advisory Group (TAG) has the following missions:
 - The COEX TAG develops and maintains the IEEE 802 policy for establishing coexistence between Standards.
 - The COEX TAG evaluates the coexistence issues between IEEE 802 PARs and Draft Standards, and makes recommendations to the IEEE 802 Executive Committee.

Coexistence Definition

- **Coexistence:** The ability of one system to perform a task in a given shared environment where other systems have an ability to perform their tasks and may or may not be using the same set of rules.
 - Coexistence is quantified by degradation (simulated or measured) under a set of usage model assumptions, which must be defined for coexisting systems

Q&A #1

- Will this group try to “quantify” coexistence?
 - Not likely – coexistence depends on so many variables (geometry, power, etc.) that defining a number that says whether you have achieved it or not isn’t practical. **Suggestion for WLAN/WPAN was made that no more than 10% degradation at 0.5 meters is a possible goal.**
- What will this group do then?
 - We (IEEE 802) currently don’t have a policy for addressing coexistence; that’s first. This policy will address the ground rules for analyzing the degradation two systems cause to each other (or pairs of systems for multiple standards).

Q&A #2

- How would this work?
 - The TAG first defines policy. For example, the policy might be to say a WG needs to pick some usage models and determine the degradation due to a set of other approved standards, pairwise. We want to examine most likely scenarios, not corner cases, which may give pathological results.
- So how would you know if two systems “coexist”?
 - The TAG is an advisory group to SEC; analysis using the usage models would be used by WGs and SEC to make informed decisions. This is a similar concept to the FCC’s OET. So the answer is that the TAG procedures will either convince voters that a Recommended Practice is needed, or that a draft has no coexistence issues and can proceed to further balloting. **SEC needs to make sure coexistence is taken seriously or inter-WG squabbling may increase.**

Q&A #3

- Does the TAG play a role other than formulating policy?
 - Possibly. The current thinking is that the COEX TAG develops a definition of coexistence and a policy to guide WG's analysis of coexistence. Beyond that, the TAG may be called upon to help resolve coexistence conflicts by writing an independent report when a draft is submitted to SEC, but this has not been agreed upon. **The TAG should be comprised of representatives from all the wireless WGs for balance.**
- What about participation and voting?
 - A TAG is governed by the same attendance and voting rules as WG's, but the specifics are not finalized.

Q&A #4

- Doesn't this need to have involvement with R-REG?
 - R-Reg deals with governmental bodies; Coex works inside IEEE 802. Several standards in the unlicensed bands are perfectly legal, but do not coexist well.
- What about drafts in process today?
 - There are three cases: Approved standards, TG drafts at various points in the approval process, and future PARs. This TAG can address future PARs, but we need a short term solution for drafts in process. Approved standards are another issue.

Notes from Monday

- Minutes: “COEX-02017r0_Coexistence-Meeting-Minutes-Sydney” on Mars
- Key points:
 - Desirable to coordinate with ETSI/BRAN
 - Discussion of “acceptable” degradation
 - Several ingredients needed in policy:
 - PHY model (easiest)
 - MAC model (harder)
 - Upper layers (hardest)
 - **Usage models are critical, and must be agreed upon between affected WG’s**

Notes from Wednesday

- Several observations that COEX TAG needs strong SEC support to be effective
- Need to address WG’s already underway: “horses have left the barn”
- Goals should be to:
 - Address coexistence sooner rather than later in the process
 - Help drafts become standards faster by providing a framework to resolve coexistence disputes
 - Make specific recommendations to WGs on how to improve coexistence of drafts before Sponsor Ballot, including possible Maintenance PARs.
- Presentation by Art Astrin of Apple on coexistence measurements

Summary

- Great participation – feedback greatly appreciated
- Growing realization that coexistence must be addressed sooner or later in the standards process.
- Coexistence policy/framework will help defuse disputes
- Balance and buy-in are important
- Moving forward to create TAG in Vancouver

- 4.6.15.3. 20r0 minutes in 17r0
- 4.6.15.4. Objectives
 - 4.6.15.4.1. Study group working to become TAG in Vancouver.
 - 4.6.15.4.2. Mission statement – creating a framework and policy for addressing coexistence across all wireless working groups.
 - 4.6.15.4.3. Want to approach coexistence from a policy viewpoint, understand usage models,
- 4.6.15.5. Discussion
 - 4.6.15.5.1. The objective to prevent getting derailed between WGs that is admirable. There is one concern – the generation of a policy. We already have FCC policies, but a coexistence policy only applicable to 802 devices could put 802 at a disadvantage in the marketplace.
 - 4.6.15.5.2. Within IEEE we can clean up our own work, but we have no control for non-IEEE standards. It is up to manufacturers to figure out how to deal with interference.

4.7. **Announcements**

- 4.7.1. The TGg chair has been asked to hold more ad-hoc calls. Specifically, there should be calls on MAC-related topics. TGg will hold conference calls, which will be announced on the 802.11 reflector.

4.8. **Special Orders – Motions**

4.8.1. TGe

- 4.8.1.1. The Task group has unanimously passed the following motion.

4.8.1.2. Motion: Request the WG to issue a 40 day letter ballot, which may be conducted by electronic means, asking the WG whether to forward 802.11e draft 3.0 to sponsor ballot, asking the sponsor group ask the IEEE-SA to adopt 802.11e draft 3.0 as standard supplement 802.11e.

4.8.1.2.1. Moved John Fakatselis on behalf of TGe

4.8.1.2.2. Motion ID 342

4.8.1.3. Discussion

4.8.1.3.1. How many comments from the last draft have been addressed?

4.8.1.3.2. We have been working for three sessions to develop this draft, plus ad-hoc teleconferences. As of LB30, we had 1500 to 1600 technical comments, and over 2000 comments with editorials. We have addressed 1200 comments, and there were about 100 comments that have not been resolved, or were indirectly resolved. The TG chair believes the draft is complete.

4.8.1.3.3. The editor states that there are notes in the draft that may not have been removed. All the remaining notes are editorial need to be removed.

4.8.1.3.4. There are informative notes as well.

4.8.1.3.5. Should the Working Group review the draft before the letter ballot.

4.8.1.3.6. The motion to go to letter ballot was unanimous. We did allocate time to review the draft before voting to send to letter ballot. The TG chair trusts the members are satisfied.

4.8.1.4. Vote on the motion: Passes 74 : 1 : 14

- 4.8.1.5. The letter ballot will be #39

4.8.2. WNG motions

4.8.2.1. Move to request 802.11 Working Group to form a Study Group for the purposes of writing a PAR and criteria to address Radio Resource Measurements to amend the published IEEE 802.11 Standard.

4.8.2.1.1.1. Moved Harry Worstell on behalf of WNG

4.8.2.1.1.2. Motion ID 343

4.8.2.1.2. Discussion

4.8.2.1.2.1. Assuming this group would require agenda time, how much time would be needed at 802.11 meetings?

4.8.2.1.2.2. The SC thinks that one session per meeting week would be required.

4.8.2.1.2.3. Against the motion – we have too much going on already.

4.8.2.1.2.4. The WG chair points out that we will not have more than 4 parallel sessions. It is unreasonable to have four parallel sessions.

4.8.2.1.2.5. It is very important for 802.11 to address these issues. It is needed for service providers.

4.8.2.1.2.6. We should have a letter ballot on this subject – too many member are not here.

4.8.2.1.2.7. Request for comments on the overlap with what is being done in TGh.

4.8.2.1.2.8. In support of a 10 day letter ballot, rather than a vote here.

4.8.2.1.2.9. In favor – as a user, Boeing and Microsoft have issues with having the information needed to manage the network.

4.8.2.1.2.10. Why does this have to be done in 802.11 – why not another body like WECA?

4.8.2.1.2.11. This is a PHY and MAC issue – it requires changes to the basics of the standard.

4.8.2.1.2.12. For the motion – it is sensible to make these measurements. 11h techniques should be applied in other bands.

4.8.2.1.2.13. We already have four concurrent sessions. There is too much going on.

4.8.2.1.2.14. This is a valuable topic. It may go slow due to limited time, but it should start now.

4.8.2.1.2.15. This is important enough to have adequate time. Against giving it only one timeslot per plenary.

4.8.2.1.2.16. In favor – the chair has stated there are over 300 members in the body – we could create a fifth parallel track with this number of people. We don't have any rule that says everyone has to participate in every task group.

4.8.2.1.2.17. There is significant history and expertise in TGh. Suggest that this new SG not overlap with TGh. As long as we can prevent that overlap, would support the new SG.

4.8.2.1.2.18. This is not a zero sum game. Starting a new activity doesn't need to take away from others. Has the ability to be the editor of this new SG. For the motion.

4.8.2.1.2.19. Is there any way to form a sub group of TGh to look at this?

4.8.2.1.2.20. TGh would like to limit their scope to the work at hand.

- 4.8.2.1.2.21. In favor of the work, but concerned about the time issue. Could we understand how much time is needed, and which task groups would lose time to this new group?
- 4.8.2.1.2.22. The WG chair cannot answer – he will work with the CAC and chairs to allocate the time, with input from the SG.
- 4.8.2.1.2.23. If it was four hours taken from TGf it would be different than taken equally from all.
- 4.8.2.1.2.24. The WG chair would try to make it equitable. But the Group is looking for 2 hours out of 53 hours available.
- 4.8.2.1.2.25. Concern is with logistics. Would support if we limited this to a couple of hours and not expand.
- 4.8.2.1.2.26. The WNG chair indicates that we can start out with a limited time allocation. Eventually it would need more time.
- 4.8.2.1.2.27. Suggest amending the motion to limit the time.
- 4.8.2.1.2.28. The WG chair says that this will be brought up on a CAC call. The CAC is trying to run the group efficiently. Agrees that there should be a 2 hour limit for the first meeting. The WG chair asks the members to trust the CAC to make a good decision on this matter.
- 4.8.2.1.2.29. Call the question

- 4.8.2.1.2.29.1. Peter Johansen
- 4.8.2.1.2.29.2. Colin
- 4.8.2.1.2.29.3. Question called without objection

4.8.2.1.3. Vote on the motion: Passes 72 : 12 : 17

4.8.2.2. Move to form a new IEEE 802.11 Study Group called the High Throughput Study Group (HTSG), to investigate the feasibility of providing throughputs greater than the existing 802.11 standard. Upon confirmation of feasibility and per 802 operating rules, the HTSG shall draft a PAR and 6 criteria to be submitted to the 802.11 WG. With the first HTSG meeting starting not earlier than September 2002 session.

4.8.2.2.1.1. Moved Harry Worstell on behalf of WNG
 4.8.2.2.1.2. Motion ID 344

4.8.2.2.2. Discussion

4.8.2.2.2.1. For the motion – if this passes, the first meeting would be September. How would that effect the time window for meeting the PAR
 4.8.2.2.2.2. Against the motion – the group doesn't have the meeting time to support this.
 4.8.2.2.2.3. The WNG feels that due to the amount of work on the table, the timetable was put in the motion. The time for this would come out of the WNG time as the WNG is taking on less activity. For the motion.
 4.8.2.2.2.4. Against the motion: The issue is still where to find agenda time. We already have many letter ballots going on.

4.8.2.2.3. Motion to amend –Change “September 2002” to “January 2003”.

4.8.2.2.3.1. Moved Duncan Kitchin
 4.8.2.2.3.2. Second Richkas
 4.8.2.2.3.3. Discussion

4.8.2.2.3.3.1. How does this effect the 6 month limit? The 6 months are from the first meeting, not the approval.
 4.8.2.2.3.3.2. Against the amendment – The compromise of September was with a large group that wanted to start immediately. This is already a significant delay. It has been held in Standing committee already.
 4.8.2.2.3.3.3. For the motion – this is just a 2 hour slot. WNG has had 6 hours, and this would come out of that.
 4.8.2.2.3.3.4. Concerned about the meeting time, it will affect the other task groups.
 4.8.2.2.3.3.5. Against the amendment – why make statements about something we want to do in January. It's too far away.
 4.8.2.2.3.3.6. Against the amendment – The amount of time needed for this group is not a burden on the other TG activities.
 4.8.2.2.3.3.7. Against – to the WG chair? How many hours were turned back this week? There were several – there is time becoming available

4.8.2.2.3.4. Call the question

4.8.2.2.3.4.1. John R
 4.8.2.2.3.4.2. Kelly
 4.8.2.2.3.4.3. Question called without objection;

4.8.2.2.3.5. Vote on the motion to amend: Fails 3 : 69 : 17

4.8.2.2.4. Discussion on the main motion

4.8.2.2.4.1. Call the question

4.8.2.2.4.1.1. John R

4.8.2.2.4.1.2.	Second John F
4.8.2.2.4.1.3.	Question called without objection

4.8.2.2.5.	Vote on the main motion: passes 80:1 : 16
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4.9. **802.11 operating rules rev 3.1**

4.9.1. Closing report in document 378r0

- 4.9.1.1. Earlier in the week we saw presentation 276r0 on problems with the rules
- 4.9.1.2. An Ad hoc group worked on resolving these issue.
- 4.9.1.3. Generated document 00/331r3.1 with changes
- 4.9.1.4. Grammatical and editorial updates.
- 4.9.1.5. Plan to conduct a WG letter ballot on these rules.

4.9.2. Motion: to conduct a 40 day WG letter ballot on the revised 802.11 WG operating rules document doc: 11-00-331r3.1
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- | | |
|----------|-----------------------|
| 4.9.2.1. | Moved John Fakatselis |
| 4.9.2.2. | Second John Rosdahl |
| 4.9.2.3. | Discussion |

4.9.2.3.1.	There are lots of revision marks – are they visible? Some machines cannot display if they have low RAM.
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- | | |
|----------|-----------------------------------|
| 4.9.2.4. | Question called without objection |
| 4.9.2.5. | Vote on the motion: Passes 87:0:1 |

4.10. **Discussion**

- 4.10.1. What is the date for the TGe Letter Ballot? Before May 28th. It will be LB39.
- 4.10.2. The motion on the rules will be Letter ballot 40. It will start 6PM on Friday next week.

4.11. **New business**

- 4.11.1. None

4.12. **WG Motions**

- 4.12.1. Presentation in Document 02/380r1
- 4.12.2. Dealing with collisions of element IDs, action codes, etc.
- 4.12.3. Propose to create an assigned numbers authority to make sure these numbers are properly managed by a single point of contact.

4.12.4. Motion: Instruct the chair to nominate an assigned numbers authority and adopt the procedures outlined in document 11-02/380r1.

- | | |
|-----------|------------------------|
| 4.12.4.1. | Moved Duncan Kitchin |
| 4.12.4.2. | Second John Fakatselis |
| 4.12.4.3. | Discussion |

4.12.4.3.1.	This is already handled, but ultimately the drafts assign the numbers. It is the responsibility of the Task Groups to track these values. Why is having a person be the ANA is necessary?
4.12.4.3.2.	The concern is that there are many drafts, that are internally consistent, but not with each other.
4.12.4.3.3.	The ANA is not the whole WG, but a single individual. This is a simple mechanism.

- 4.12.4.3.4. The assignment of numbers should have come through the WG, but didn't, since there is no procedure. This is such a procedure.
- 4.12.4.3.5. In favor – there is a problem, and this is the right thing to do. Who are the possible owners? Task groups and the WG? When a standard is published, the owners pass from TG to WG.
- 4.12.4.3.6. POI – have you considered a provisional assignment to recover numbers if the draft doesn't become a standard? Yes there is a revocation procedure.
- 4.12.4.3.7. Would this be private, like a draft? Doesn't matter. Probably public.
- 4.12.4.3.8. This could be put in the rules – should be made in comments to LB40 on operating rules.
- 4.12.4.3.9. Would IANA numbers be included as well? Yes, we could include numbers issued by other authorities.
- 4.12.4.3.10. Is the owner the TG or WG? Yes, there is no individual membership.
- 4.12.4.3.11. Who is considered to do this? Could be Harry , or Duncan volunteers.
- 4.12.4.3.12. There is a bigger problem – numbers are just one part. The protocol itself can conflict – EG action frames, etc.
- 4.12.4.3.13. Stability of numbers is important – if we make changes late in the process, it can cause conflicts.
- 4.12.4.3.14. The bigger question of protocol issues is not easily solved, the joint meetings are the best way to approach it.
- 4.12.4.3.15. This problem has been documented before, it is significant – for the motion. Questions having management action codes in there. Agrees that the order of elements is needed.
- 4.12.4.3.16. We need a provision that elements are always in increasing order.
- 4.12.4.3.17. The numbers can privilege certain applications. Questions putting it in the realm of one person. In the short term we have conflicts that need to be fixed right now.
- 4.12.4.3.18. What is an example of a number that favors an application? An application is disadvantaged if it has to use an escape mechanism.
- 4.12.4.3.19. The use of the escape mechanism is based on first come first served.
- 4.12.4.3.20. How do we get started? The document contains all of those already in approved documents. All others need to be assigned by request.
- 4.12.4.3.21. Then any draft we have today might have to be changed? We can't vote if they are consistent, or if they will work.
- 4.12.4.3.22. This motion does not alter that fact – we have known conflicts now.

4.12.4.4. Motion to amend – append the text “and approve starting the assigned numbers list with inclusion of the numbers assigned in approved standards together with those used in 802.1e draft 3.0”

- 4.12.4.4.1. Moved John Kowalski
- 4.12.4.4.2. Seconded Srini Kandalas
- 4.12.4.4.3. Discussion

- 4.12.4.4.3.1. Against - Would prefer Terry Cole's resolution.
- 4.12.4.4.3.2. Against this amendment – there are conflicts with 802.11h.

- 4.12.4.4.3.3. Suggests that those that are against this make additional amendments. We need an initial condition.
 4.12.4.4.3.4. Against the amendment – proposing an amendment to the amendment –

4.12.4.4.4. Motion to amend the amendment: Append the text “and approve starting the assigned numbers list with inclusion of the numbers assigned in approved standards together with those used in the current drafts of 802.11e, 802.11g, 802.11h, and 802.11i for instances that are not conflicting.”

- 4.12.4.4.4.1.1. Moved Duncan
 4.12.4.4.4.1.2. Second Dave Halasz

4.12.4.4.4.2. Discussion

- 4.12.4.4.4.2.1. Against this mess , it should be worked out with an ad-hoc group.
 4.12.4.4.4.2.2. For the amendment to amendment – this is a trivial problem. This allows the existing work that doesn't conflict to be maintained, and prevents problems.
 4.12.4.4.4.2.3. Call the question)Donald / Duncan) no objections.
 4.12.4.4.4.2.4. Point of order – you can't call all the questions and skip the votes

4.12.4.4.4.3. Vote to amend the amendment: Passes 38 : 9 : 29

4.12.4.4.5. Vote on the motion to amend : passes 47 : 9 : 21

4.12.5. Motion on the floor: Instruct the chair to nominate an assigned numbers authority and adopt the procedures outlined in document 11-02/380r1 and approve starting the assigned numbers list with inclusion of the numbers assigned in approved standards together with those used in the current drafts of 802.11e, 802.11g, 802.11h, and 802.11i for instances that are non-conflicting.

4.12.5.1. Vote on the motion: Passes 64 : 6 : 8

4.13. Discussion

- 4.13.1. The WG chair will bring this issue to the CAC and discuss it.
 4.13.2. What will be the procedure for resolving conflicting fields? The WG chair will bring it to the CAC.
 4.13.3. Document 300 identifies conflicts in existing standards. So those will not be pre-assigned. The WG chair directs the CAC to include document 300 in the discussion of these numbers. The TGg chair will bring document 300 as an input.

4.14. 802.18 RREG Motions

4.14.1. Motion: To approve document 18-02-005r0 IEEE 802 Cmts 02_98.doc as posted on the 802.11 meeting server PM Thursday 05/16/02, for filing with the FCC, authorizing the Chair of 802.18 to add a cover letter and certificate of service, editorial reformat the document as appropriate (remove IEEE 802 headers and footers), and file electronically with the FCC on behalf of IEEE 802 (subject to SEC approval as per LMSC rule) prior to the filing deadline.

- | | |
|-----------|---|
| 4.14.1.1. | Moved Carl Stephenson on behalf of 802.18 |
| 4.14.1.2. | Call the question without objection |
| 4.14.1.3. | Motion ID 347 |
| 4.14.1.4. | Vote: Passes 55 : 0 : 6 |

4.15. Any other business?

- 4.15.1. None

4.16. Announcements

- 4.16.1. Make sure the attendance/contact information is correct
4.16.2. Motion to adjourn (Carl / Anjab) No objection

4.17. The meeting is adjourned at 11:47AM

Attendance list for the meeting held at **The Wentworth, Wenworth Sydney NSW**

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Thursday, June 27, 2002

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IEEE P802.11
Wireless LANs

Minutes of 802.11 Task Group E
MAC Enhancements - QoS

Wentworth Rydges Hotel, Sydney, NSW, Australia

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1. Monday Morning TGe, May 13, 2002

1.1. Opening

- 1.1.1. Meeting called to order at 10:30AM by John Fakatselis
- 1.1.2. Secretary Tim Godfrey

1.2. Agenda

- 1.2.1. TGe agenda as in document 02-278
 - 1.2.1.1. Standard opening formalities
 - 1.2.1.2. Comment Resolution
 - 1.2.1.3. Preparing a new draft
 - 1.2.1.3.1. We have not updated the draft since November. We have approved new normative text while resolving comments. We need to consolidate all comments into a new draft, and issue it as a new letter ballot.
 - 1.2.1.3.2. We want to continue the ad-hoc groups continue to address specific outstanding topics.
 - 1.2.1.3.3. Two Ad Hoc groups , one editorial, and one addressing technical issues, both in the same room.
 - 1.2.1.3.4. The agenda indicates "TG Discussion" for times for full TG sessions. At these times we discuss and vote on motions.
 - 1.2.1.3.5. TG Discussion have been placed in every day, starting tomorrow.
 - 1.2.1.4. We have a joint session with TGg to discuss MAC issues. Wednesday AM.

1.2.1.5. *On Thursday, we have fixed time agenda items starting at 7:30PM for the presentation of the new draft and vote on sending it to Letter Ballot.*

1.2.2. **Discussion on Agenda**

1.2.2.1. *With respect to TGi and TGh letter ballots, there are items that were inconsistent with TGe – frame formats for example. How are we going to resolve this?*

1.2.2.2. *The chairs meeting on Thursday AM will address this. It is not addressed on this agenda, though.*

1.2.2.3. *How do we get something on the agenda? We have a proposal that has been discussed in the 1394 WG. We want time on the agenda to have it considered to be included in the draft. It should be brought up in “call for papers”. The technical ad-hoc can address them and generate the normative text.*

1.2.3. **Vote on the agenda**

1.2.3.1. *The agenda is adopted with unanimous consent.*

1.3. **Roll call**

1.3.1. **How many new people are here?**

1.3.1.1. *About 15 people are new at this meeting, about 25%.*

1.4. **Objectives for this session**

1.4.1. **The goal is to complete the draft and forward for Letter Ballot.**

1.4.1.1. *Assign editorial team, with a managing editor. The managing editor will be the owner of the document and coordinate updates as they are approved.*

1.4.1.2. *Srini will assemble all the motions that are yet to be included into the draft.*

1.4.1.3. *Editorial team should include the authors themselves, and some technical experts to serve as real-time reviewers.*

1.4.1.4. *There are motions from the past three sessions that need to be incorporated.*

1.4.2. **Discussion on the objectives**

1.4.2.1. *How will we manage conflicts between ad-hoc groups and editing tasks? Hopefully, the ad-hoc groups will address things that have not been addressed yet, and the editorial groups will handle work that has already been approved.*

1.4.2.1.1. *There will be regular opportunities for the editorial and ad-hoc teams to join together.*

1.4.2.2. *Are we going for recirculation or letter ballot? We don't think recirculation will provide any benefit at this point? But it could be helpful after the next LB.*

1.4.2.3. *The editorial team is not requesting a long-term commitment of time.*

1.4.3. Review of Schedule for the week

1.4.3.1. *Three times are scheduled for TGe sessions with voting*

1.4.3.1.1. *Tuesday 10:30AM to 12:00*

1.4.3.1.2. *Wednesday 3:30PM to 5:30*

1.4.3.1.2.1. *Final Ad Hoc motions. Editorial changes to be incorporated before the draft time limit – 4 hours before vote on Thursday.*

1.4.3.1.3. *Thursday 7:30PM to 9:30*

1.4.3.1.3.1. *Final draft to be available at 4:30PM. Motions will be made to forward draft to LB.*

1.4.4. Discussion on the schedule

1.4.4.1. *Could we consider the alternate process of using a 10 day Letter Ballot to ask the question if we should go to a letter ballot?*

1.4.4.1.1. *The chair reserves this as an option. It would be less complicated if we have the draft completed this week.*

1.4.4.1.2. *Is this a hard deadline? No, we should not compromise on quality to meet the deadline. We will review progress during the week and see what the best approach is.*

1.4.4.2. *The time from the end of this meeting from this meeting to the next is 50 days. It is impossible to have both a 10 day and a 40 day LB before the next meeting. There is a significant benefit to having the draft ready at the end of this meeting.*

1.4.4.3. *We should concentrate on getting a Letter Ballot quality draft out, not meeting the schedule.*

1.4.4.4. *Is the 10 day ballot a fixed rule? Why not 5 days? 802 rules do not allow anything shorter than a 10 day LB.*

1.4.4.5. *There is a lot of competitive industry pressure to deliver this work. There is a lot at stake for 802.11 and the industry.*

1.5. Goals and Tasks**1.5.1. Selection of Managing Editor**

1.5.1.1. *Srini Kandalas is nominated.*

1.5.1.1.1. *Moved John Fakatselis, Second Harry Worstell.*

1.5.1.2. *Any other nominations? None*

1.5.1.3. *Srini is the Managing Editor, approved by acclamation.*

1.5.2. Selection of Editorial Team

1.5.2.1. *Authors*

1.5.2.1.1. *Sunghyun Choi*

1.5.2.1.2. *John Kowalski*

1.5.2.1.3. *Keith Amman*

- 1.5.2.1.4. *Adrian Stephens*
- 1.5.2.1.5. *Sid Schrum*
- 1.5.2.1.6. *Harry Worstell*
- 1.5.2.2. **Reviewers**
 - 1.5.2.2.1. *Atul Garg*
 - 1.5.2.2.2. *Menzo*
 - 1.5.2.2.3. *Peter Johansson*
 - 1.5.2.2.4. *Dave*
 - 1.5.2.2.5. *Shugong*
 - 1.5.2.2.6. *Ohtani*
 - 1.5.2.2.7. *Ho-In Jeon*
 - 1.5.2.2.8. *Isaac*

1.6. Review of Policies and Rules

1.6.1. Voting and Motions

- 1.6.1.1. *Non-members can ask a voting member to forward a motion on their behalf.*
- 1.6.1.2. *Please refrain from abusing motions such as point of order, parliamentary enquiry, etc.*

1.6.2. Any questions on process or participation?

1.7. March minutes

1.7.1. Any matters arising from the minutes of March 2002?

- 1.7.1.1. *None*

1.7.2. Approval of minutes from March –

- 1.7.2.1. *Approved without objection.*

1.8. Status of comments

1.8.1. Document 02/084r11, as of April 29th

- 1.8.1.1. *930 comments resolved*
- 1.8.1.2. *1084 unresolved, 669 are editorial*
- 1.8.1.3. *There are 138 unassigned comments*
- 1.8.1.4. *The HCF has the largest block*
- 1.8.1.5. *At this point there are roughly 1000 comments to be dealt with, but 670 are editorial.*

1.9. Call for papers

1.9.1. Comments

- 1.9.1.1. *Papers are out of order if they are not accompanied with normative text.*
- 1.9.1.2. *The only appropriate papers contain text that improve our existing draft.*
 - 1.9.1.2.1. *Discussion*

- 1.9.1.2.1.1. Does it have to be explicit? Yes – you can't just say "instruct the editor".

1.9.2. Submissions:

1.9.2.1. Sid Schrum

- 1.9.2.1.1. *Dual Scrambling for FEC – Chris Heegard (in Joint E/G session).*
- 1.9.2.1.2. *Schrum, et al. Submission to the FEC group – example FEC frame. No presentation needed. Informative Text to FEC group.*
- 1.9.2.1.3. *Schrum Et Al. HCF CF Access Limits. Addresses LB comments on HCF.*
- 1.9.2.1.4. *Jay Meng: CC/RR Performance Evaluation*

1.9.2.2. Sunghyun Choi

- 1.9.2.2.1. *1394 clock synchronization over 802.11.*
- 1.9.2.2.2. *Definitions of ACK and CTS Time out (02/313r0)*

1.9.2.3. Matt Sherman

- 1.9.2.3.1. *(02/330r0) commentary on 02/223r1 in support of CC/RR*
- 1.9.2.3.2. *(02/304r0) In Defense of CC/RR*
- 1.9.2.3.3. *(02/305) Evaluations of RR over EDCF*

1.9.2.4. Lior Ophir

- 1.9.2.4.1. *Dynamic Update of the QoS Parameter Set (HCF group)*

1.9.2.5. Duncan Kitchin

- 1.9.2.5.1. *Not to be presented: Clock Distribution for 1394. No Normative Text.*

1.9.3. Summary:

- 1.9.3.1. *Total of 11 papers, 7 have normative text*
- 1.9.3.2. *Scheduling*
- 1.9.3.2.1. *15 minutes presentation for each.*

1.9.4. Discussion

- 1.9.4.1. *Any other topics that need to be discussed during technical Ad Hoc meetings?*
- 1.9.4.1.1. *None*
- 1.9.4.2. *Lior has a motion of the form "instruct the editor". He will try to improve it before he presents.*

1.10. Review of editorial team members

1.11. Recess for Ad Hoc groups

2. Tuesday Morning TGe, May 14, 2002

2.1. Opening

- 2.1.1. Meeting called to order by John Fakatselis at 10:30AM
- 2.1.2. This session will accept motions from the Ad Hoc groups

2.2. Update from Editorial Ad Hoc

- 2.2.1. Srinu – We have incorporated the inputs from previous draft.
- 2.2.2. Discussion
 - 2.2.2.1. *There has been a lot of discussion on frame formats.*
 - 2.2.2.2. *If we feel we need more time to work on the draft, we will need to have 10 day letter ballot. We will still have to provide some text to go along with that letter ballot.*
 - 2.2.2.3. *The latest version of the draft is on the server.*
 - 2.2.2.4. *Reviewers should give input on the draft as it develops.*

2.3. Motions from Technical Ad Hoc

- 2.3.1. Motion that TGe adopt the text contained in 11-02/324r0, with any appropriate changes arising from other motions, to be included as an informative annex in the draft.
 - 2.3.1.1.
 - 2.3.1.2. *Passes unanimous consent*
- 2.3.2. Motion to modify the draft to specify the management and all types of burst ack control frames be sent at the highest priority.
 - 2.3.2.1. *Moved Kowalski, Second Adrian*
 - 2.3.2.2. *Passed by unanimous consent*
- 2.3.3. Motion that TGe incorporate the normative text from document 02/341r0a into the draft with the amendment proposed on slide 6 replacing “TBD ms” with “2 ms”
 - 2.3.3.1. *Moved Srinu K, Sid Schrum*
 - 2.3.3.2. Discussion
 - 2.3.3.2.1. *This is regarding how much time a station is allowed to update a new set of QoS parameters received in a beacon.*
 - 2.3.3.2.2. *Concern about specifying internal implementation response times. We typically chose to not*

- specify times like this, and this is inconsistent. Against the motion. Suggests a longer time such as a beacon interval.*
- 2.3.3.2.3. *In favor of the motion – we need some constraint for QoS. Without it, a station could never use parameters.*
- 2.3.3.2.4. *Why were 2mS chosen? It seems like a nice number... It seems long enough for most implementations.*
- 2.3.3.2.5. *In favor of the motion – we have a mechanism to update the QoS Parameters, but no way to mandate they are used. A grace period is OK, but a limit is needed.*
- 2.3.3.2.6. *These parameters are not updated frequently. 2mS seems too short, though. We do need a number, though. We do have the beacon interval time already defined. 100mS may be too long, but probably OK.*
- 2.3.3.3. *Motion to amend : change “2mS” to “beacon interval”.*
- 2.3.3.3.1. *Moved Sunghyun Choi*
- 2.3.3.3.2. *Second Ho-In*
- 2.3.3.3.3. *Discussion*
- 2.3.3.3.3.1. *What is the maximum beacon interval allowed? Is it too long?*
- 2.3.3.3.3.2. *In a QoS, the beacon interval will be more rapid. So in practice, it is not an issue.*
- 2.3.3.3.3.3. *Against the motion – 2mS is very acceptable. But the issue is moot – we accepted a set of default parameter values which are useable in most cases. So there is no reason to have an update mechanism. But since it is there, it is OK, but why wait a beacon interval.*
- 2.3.3.3.3.4. *Against the amendment – what if someone used the prioritized facility to transmit AV data – tight control is required, and fast update is needed. You could experience a glitch due to the delayed updating. Prefers 2mS.*
- 2.3.3.3.4. *Vote on the motion to amend:*
- 2.3.3.3.4.1. *Passes 29: 7 : 4*
- 2.3.3.4. *Main Motion: that TGe incorporate the normative text from document 02/341r0a into the draft with the amendment proposed on slide 6 replacing “TBD ms” with “one beacon interval”*
- 2.3.3.4.1. *Discussion*
- 2.3.3.4.1.1. *Against the motion – EDCF is a mechanism that works with stable parameters. There isn't simulations that justify fast update of parameters. There is no need.*
- 2.3.3.4.1.2. *Against the motion because 2mS is better.*
- 2.3.3.4.1.3. *In favor – there is already a mechanism there, but this doesn't say they have to be used. This mechanism allows the HC the ability to adjust the parameters.*

- 2.3.3.4.1.4. In favor – as long as we have the parameters, we need a value.
- 2.3.3.5. *Vote on the motion: passes 27: 8: 9*
- 2.3.4. Motion that TGe adopt the normative text contained in slide 5 of document 02/326r0, with a default dot11MaxCAPLimit value equal to 90% of dot11BeaconPeriod, and default dot11MaxCAPWindow value equal to dot11BeaconPeriod.**
- 2.3.4.1. *Discussion*
- 2.3.4.1.1. *This text provides an externally controllable mechanism to limit the amount of time that an HC provides contention free access to the channel, giving time for EDCF access on the channel. These are MIB parameters.*
- 2.3.4.1.2. *There are actually two values. Default percentage is easy to agree, but times would not. The values should be specified as time and ratio, not times.*
- 2.3.4.1.3.
- 2.3.4.2. *Moved Sid Schrum*
- 2.3.4.3. *Second Ho-In Jeon*
- 2.3.4.4. *Discussion*
- 2.3.4.4.1. *What happens after the CAP of the limit? Is the AP not allowed to access the medium? Only CCIs or CAPs would be prohibited for the next 10%. A sliding window.*
- 2.3.4.4.2. *This makes the HC backoff independent of OBSS issues.*
- 2.3.4.4.3. *Against the motion- what if this limit has been reached?*
- 2.3.4.4.4. *For the motion – It is very adequately described how to use it, but something more sophisticated can still be used.*
- 2.3.4.4.5. *Call the question (Adrian/ Srin) no objection*
- 2.3.4.5. *Vote on the motion: Fails 23: 16 : 6*
- 2.3.5. Move to remove the TClas element and all references thereto from the draft.**
- 2.3.5.1. *Moved Kowalski*
- 2.3.5.2. *Second Adrian Stephens*
- 2.3.5.3. *Discussion*
- 2.3.5.3.1. *The TClass needs more work, but until we work on it, it premature to remove it.*
- 2.3.5.3.2. *There is really no need for this to be in the MAC to generate a TSPEC. We can provide informative text on how to generate the TSPEC.*
- 2.3.5.3.3. *Against the motion: A Tclas from the station is important to provide to the AP. This allows a station to set up a downlink portion of a tspec.*
- 2.3.5.3.4. *It can be set up by a negotiation at a higher layer.*
- 2.3.5.3.5. *But what higher layer protocol is used? It is unknown, and not standardized. That is a problem.*

2.3.5.3.6. *For the motion: Tclas is an instruction to the MAC to look at the MSDUs. That's a bad thing to do. Or it's a communication mechanism between MACs – there are other ways to do this.*

2.3.5.4. *Vote on the motion: passes 26 : 7 : 10*

2.3.6. Move to instruct the editor to include an informative annex to describe how a TSpec could be generated from information passed to the MAC. John Kowalski is volunteering to write this.

2.3.6.1. *Moved John Kowalski*

2.3.6.2. *Second Shugong Xu*

2.3.6.3. *Vote on the motion – passes with unanimous consent.*

2.4. Review of technical Ad Hoc

2.4.1. The HCF channel access discussion resulted in a recommendation is to proceed with what is in the draft. There is no motion resulting.

2.4.1.1. *The current draft – not 2.0a – does actually include mandatory backoff. We may want to change it back from “shall” to “may”.*

2.4.1.2. *We will review comment ID 1535. The change was adopted in March. This needs to be revisited*

2.4.2. HC Error Recovery

2.4.2.1. *Two ways the HC regains control of the medium. Once the TXOP is confirmed after detecting CCA, the HC only regains control at the end of the TXOP or when explicitly handed back.*

2.4.2.2. *The recommendation again is to take no action.*

2.4.3. Specific Comments

2.4.3.1. *Comment 1376. Were accepted in 597r1 regarding Qstate element. Not yet reflected in the draft 2.0. This comment was accepted Draft 2.13 contains this..*

2.4.3.2. *This comment is accepted without objection.*

2.4.3.3. *Comment 1377 accepted without objection*

2.4.3.4. *Comment 1379 – reclassify as editorial – no objection.*

2.4.3.5. *Comment 1384 – Adopt text in D2.0a – accepted without objection.*

2.4.3.6. *Comment 1390 – make explicit statements, was considered editorial: – accepted without objection.*

2.4.3.7. *Comment 1392 – 7.4.1 should have been updated 01/557r0 from Austin. The r1 document was in conflict. The comment was rejected since the requested action is inconsistent with the rules of order. – resolution accepted without objection.*

2.4.3.8. *Comment 1432 – Question about efficacy of MAC FEC. Resolution – simulations have been provided
Comment rejected. - resolution accepted without objection.*

2.5. Recess at 12:00

3. Minutes from Joint TGe and TGg session May 15, 2002

Secretary for this session – Kevin Smart

The meeting was called to order by John Fakatselis at 08:15

There were four papers to be presented for joint review, but we don't have a precise plan for running the meeting. We have made the decision to be able to take motions during this meeting.

Matthew Shoemake: We have about 1:45 together. We have four papers that will be presented. I will do another call later. Terry Cole took a set of comments that are related to MAC issues that we want to present.

No further documents were identified.

The documents were in no particular order, but no one volunteered to go first, so the order listed was the order we were going to present.

The first paper to be presented is Terry Cole's "Slides to Assist with Joint Meeting of TgE and TgG."

Presenting Document 11-02-300r0

"Boring" stuff:

1. Capability Bit Overloading

Bits b8 and b9 are overloaded in the current draft. The good news is that we still have enough bits to solve the problem. The idea is to try to solve the problem here in the joint TGg and TGe meeting. Terry's proposal: TGg use b9, b10 and TGe use b12, b13, b14, and b15. That way we can solve the problem without involving the other groups.

2. Information Element Overloading

3. Management Frame Orders

The chairs recommend that the editors should get together and come back with a joint recommendation. They may also need to get together with the other groups.

There was no discussion, so Carl and Srinu were directed to get together and come back to the groups with the editors' recommendation by tomorrow 2002-05-16. This was done with no other discussion. The scope includes: capability bits, information element, and management frame orders.

TGe Chair is making a statement regarding SDL. TGe has decided to not follow the precedent regarding SDL and is not planning to supply the SDL. They don't see a way of coordinating the SDL. Therefore, they are NOT making a requirement of SDL. The individual pieces will do SDL as they feel appropriate. They will continue upon this approach until they hear otherwise.

TGg Chair: TGg is heading in a similar direction regarding SDL.

Marty: I believe this is the right direction, but I am concerned that the state diagrams in 802.11 as a whole follow some sort of methodology.

Terry: I have a practical question. Annex C is a portion of the standard. Once the standard is all combined, how can we drop this?

Answer: The documents say that Annex C text should be removed

TGg Chair: Marty, your question is another question of coordination.

Jim Z.: How do these questions get answered?

TGg Chair: When we talk about motions they will go to the joint plenary.

Jim Zyren: Instead of draft modifications, we are talking with these overloaded functions.

TGg Chair: We are just ...

TGe Chair: TGg has any right to ask the MAC groups to make any appropriate changes. If there a conflict with the PAR, we need to change the PAR. We want to leave it up to the editors to solve these overloading problems.

Terry: That was the end of trying to resolve MAC comments. From this point forward, these are my comments. I want to make sure that the TGg PHY can work with the existing MAC as well as future MACs. What should happen to a .11b network once .11g devices are added? We believe the .11b devices perform about the same, but the .11g devices work better and more efficiently. In trying to design this we recommended some MAC changes.

Next presentation 11-02-181r1 by S. Choi.

S. Choi: RTS/CTS comments. There are some issues with RTS/CTS. We should try to minimize the usage of RTS/CTS in .11g networks. We should use the CFP to create a .11g CP that .11b devices will think is the CFP. This essentially makes a period the protects .11g devices from .11b devices. This allows .11g devices to avoid using RTS/CTS.

Motion: Move to adopt the .11g CP mechanism specified in document 11-02-181r1 into the IEEE 802.11g draft by making the change specified on slide 22.

Moved: S. Choi

Seconded: Albert Young

Choi: This will allow us to have higher performance with .11g networks. Strongly support.

Menzo: Did you compare the efficiency in throughput with .11e MAC?

Choi: If you combine the .11g PHY with the .11e MAC, most of the problems go away. This is a temporary solution. This is a complimentary mechanism.

Adrian: What we have here is a scheduling mechanism. I have a concern because we don't have adequate signalling to control the size of the .11 CP. Speaks against.

Choi: I agree partially, but I would try to minimize the size of the .11 CP so only a few .11g CP can be done.

Terry Cole: I speak against the motion. I don't believe this is flawed, but I would like to contest the this causes no harm to .11b stations. This seems like it will reduce throughput to the .11b network. This limits the CP to an OFDM CP and a common .11b/g CP. I have simulated this in 11-02-301. I have examined other mechanisms and have decided that we should do nothing. The RTS/CTS is robust enough.

Choi: Gave a rebuttal to Cole's position.

Marty: Why do we need to use the legacy bit with the system at all? The AP should understand.

Choi: I am not really touching the legacy bits at all.

Menzo: Concerned about time-sensitive transmissions. I believe that the two periods will cause inefficiencies. I am going to vote against it.

Choi: If you use .11e in the future, this will not be necessary. If you are concerned with it, you can try to minimize the usage of this.

Lior: My understanding is that this proposal is based on CF awareness of legacy devices, but there are many devices that are not CF aware.

Choi: True, there are several devices that are not CF aware, but the AP can manage this.

Chris: I am confused about the timing of this. TGg and TGe are well along. What is the need of having an interim solution.

Sean Coffey: I am not clear on a couple of things. Where does the ER-PBCC fit in? Is it only in the .11g CP?

Choi: In .11g only pure OFDM has the problem. We don't need RTS/CTS with ER-PBCC.
Debate was limited by unanimous consent.

Vote (technical): 10/37/32 vote fails

Document 11-02-325 by Chris Heegard. Dual precoding with FEC packets

Motion (for TGe): Move to incorporate the normative text in section 2 of 11-02-325r0 into the IEEE 802.11e draft.

Moved: Chris Heegard

Seconded: Richard Williams

John Kowalski: Is it possible for a non-FEC capable to interpret the packet.

Chris: No. The first portion is in the clear, but the second through the end are not.

Adrian: Does the use of this extend the frame?

Chris: No. This introduces no length extension. All pre-coding is initialized to zero.

Mark Webster: Would this be used only on the RS packets?

Chris: Yes.

Question: Is this only for .11a?

Chris: This applies for .11a and .11g. It will work for .11b, but it is not necessary.

Jim Zyren: Directed to the chair. What is the policy on patents? Is a question regarding patents on this mechanism in order?

Jim Zyren: Chris are you aware of any patents or applications that may be relevant to this presentation?

Chris Heegard: I know of no patents and TI has submitted to the IEEE a letter regarding intellectual property.

Jim: Can you comment to any patent applications that may apply?

Chris: I have no comment.

This discussion will continue at the TGe session at 1:00 PM.

Steve Halford: We are putting this off until a time that we can't do this as a joint session.

TGg Chair: We could reconvene as a joint TGg/TGe session at 1:00 PM.

Question: There was a special order for TGe at 1:00 PM.

Is there any objection to continuing this at

Motion: Move to resume the joint TGg/TGe at 1:00 PM.

Moved: Richard Williams

Seconded: Sean Coffey

Question called.

Chris Heegard/Sean Coffey

Vote: 40/5/16 The question is called

Vote for original motion (procedural): 40/22/13 motion passes

The meeting is recessed until 1:00 PM.

Called the meeting to order at 1:10 PM.

The chair is asking to limit the discussion to 15 minutes. This was done by unanimous consent.

Chris Heegard: I would like to say I learned that there was a problem with the FEC about six months. I have worked on that and have gone through several iterations. At the last meeting, there were some objections because it scrambled the header. We fixed that flaw. I believe that people should support this.

Steve Halford: Point of Order. We haven't had a chance to ask questions.

Mark Webster: This scrambler-descrambler is essentially identical to what is in .11b?

Chris: Yes

Question: Any information on performance benefits such as PER?

Chris: Historically there were some simulations. There were some problems due to this scrambler. If you fix this problem, you get back to the original curves.

TGg Chair: S. Choi didn't you present a paper on this?

Yes: Document 11-02-050r0.

Sean Coffey: Document 11-02-239 was a document that we

Asked for unanimous consent for adopting the motion. There were two objections.

Chris asked a question: Is someone trying to propose a different solution? I believe that this is a solution to this problem.

No one else is presenting a solution.

Lior: We are not voting whether FEC should be there or not. It is there. We are just trying to fix the flaw. I speak in favour this.

The question is called:

Vote on the motion (technical): 20/12/20 motion fails.

Chris Heegard moves:

Motion: I move that we remove the FEC from the 802.11e draft.

Moved: Chris Heegard

Seconded: Thomas

Motion: Move to table.

Moved: John Kowalski

Seconded: Peter Johansson

Not debatable.

Vote: 26/19/5 (motion passes, the motion is tabled to TGe's table)

There are no further topics for the joint TGg/TGe session.

2002-05-15 1:27 PM

The joint meeting is adjourned.

4. Wednesday afternoon TGe, May 15, 2002

4.1. Opening

- 4.1.1. The meeting is called to order at 3:30PM by John Fakatselis.
- 4.1.2. We will entertain motions from the ad-hoc sessions and the editorial groups.

4.2. Objective

- 4.2.1. Tentative draft available – D2.18, is on the server
- 4.2.2. Any motions from Ad-Hoc activities.

4.3. Old Business

- 4.3.1. Straw poll from the previous session regarding the FEC scrambler / descrambler.
 - 4.3.1.1. Option 1 – We support FEC in TGe, and don't feel that the OFDM scrambler is a problem that needs to be fixed. 5 votes
 - 4.3.1.2. Option 2 - We support FEC in TGe, and do feel that the OFDM scrambler is a problem that needs to be fixed. 11 votes
 - 4.3.1.3. Option 3 – We don't support FEC. 8 votes
- 4.3.2. Second straw poll (given that FEC is in the standard);
 - 4.3.2.1. Option1 – the OFDM scrambler is a problem and should be solved. 20 votes
 - 4.3.2.2. Option 2 – the OFDM scrambler is not a problem. 7 votes
- 4.3.3. Discussion
 - 4.3.3.1. The mover would like to have someone in the body move to reconsider the previous motion that failed regarding the FEC scrambler.
 - 4.3.3.2. Will announce to TGg, and put on agenda for TGe in Thursday AM session. Someone will have to move to reconsider at that time.

4.4. Motions from the floor

- 4.4.1. Move to reconsider the deletion of the TCLAS element.
 - 4.4.1.1. John K
 - 4.4.1.2. Sunghyun
 - 4.4.1.3. Vote on the motion to reconsider: Fails 15:9:5

4.5. Update on the draft

- 4.5.1. Draft 2.19 has now been uploaded.

4.6. Straw Poll

- 4.6.1. How many people have voted no on the most recent letter ballot and voted no?
 - 4.6.1.1. *There are 12 no-voters.*

4.7. Motions from the Ad Hoc committee

- 4.7.1. Motion that TGe adopt the text contained in 11-02/297r2 to be included in the draft as modified by the deletion of the delay and delay tolerance parameters
 - 4.7.1.1. *Moved Duncan K*
 - 4.7.1.2. *Second Peter J*
 - 4.7.1.3. *Vote: Motion passes by unanimous consent.*

4.8. Comment Resolutions (from 02/084r13)

- 4.8.1. **Comment 1544**
 - 4.8.1.1. *Disposition – accepted*
 - 4.8.1.2. *Resolution accepted without objection*
- 4.8.2. **Comment 1546**
 - 4.8.2.1. *Accepted*
 - 4.8.2.2. *Resolution accepted without objection*
- 4.8.3. **Comment 1548**
 - 4.8.3.1. *Accepted*
 - 4.8.3.2. *Resolution accepted without objection*
- 4.8.4. **Comment 1552**
 - 4.8.4.1. *Declined*
 - 4.8.4.2. *Resolution accepted without objection*
- 4.8.5. **Comment 1584**
 - 4.8.5.1. *editorial – accepted*
 - 4.8.5.2. *Resolution accepted without objection*
- 4.8.6. **Comment 1598**
 - 4.8.6.1. *Declined – alternative implementation*
 - 4.8.6.2. *Resolution accepted without objection*

4.9. The next Letter Ballot

- 4.9.1. The chair asks the no-voters to study the resolutions in 02/084r13, and see if there is any other motions needed to reverse the vote from No to Yes.
 - 4.9.1.1. *When is the last point to make changes to the draft?
Tomorrow at 4:30PM.*

- 4.9.1.2. *We need to start the process of reversing No votes.*
- 4.9.1.3. *What if the motion needed to reverse a vote has been addressed and the motion failed.*
- 4.9.1.4. *The chair rules that we deviate from the rules: outstanding No-vote issues should be allowed to be reconsidered, regardless of previous motions or votes.*
 - 4.9.1.4.1. *There is an objection.*

4.9.2. Discussion

- 4.9.2.1. *It is inappropriate to attempt to ask a voter to indicate their intentions at this point without lengthy review of the draft.*
- 4.9.2.2. *The chair is not asking to indicate a voting intent, but rather if any outstanding issues from the previous letter ballots have been addressed in the known changes to the draft. Are there any known issues that are responsible for No votes that have not been addressed?*
- 4.9.2.3. *Regarding the TCLAS element – there are a number of ways to bring it back.*

4.9.3. Motion – to suspend the rules related to reconsideration and grant automatic reconsideration if a “No voter” from Letter ballot 30 would like to bring a motion on their comments for reconsideration.

- 4.9.3.1. *Moved John Kowalski*
- 4.9.3.2. *Discussion*
 - 4.9.3.2.1. *The only way a person can bring a motion is if it is based on a No vote? But there is no comment related, since the issue has come up since then.*
 - 4.9.3.2.2. *The chair says it has to be based on a comment on a previous letter ballot that has not been resolved.*
 - 4.9.3.2.3. *Against this – the purpose of the motion to reconsider is to find someone who has changed their mind. There is a 2/3 margin to keep from addressing the same thing over and over.*
 - 4.9.3.2.4. *The reason this comes up is because a number of people have changed their minds. There is an escape procedure – we can vote to rescind this motion.*
- 4.9.3.3. *Seconded – Ho-In Jeon*
- 4.9.3.4. *Discussion*
 - 4.9.3.4.1. *Isn't a motion requiring a 2/3 majority protecting the minority, and thus not able to be suspended?*
 - 4.9.3.4.2. *5 minute recess*

4.9.4. Motion to suspend the rules to reconsider without further vote motion 2.3.5 “Move to remove the TClas element and all references thereto from the draft”

- 4.9.4.1. *Moved John Kowalski*
- 4.9.4.2. *Second Ho-In Jeon*

4.9.4.3. *Discussion*

4.9.4.3.1. *This does not change reconsideration of any other motions. The chair asks other no-voters to review the addresses comments and prepare any desired motions.*

4.9.4.4. *Vote on the motion: Passes 21 : 9 : 3*

4.9.5. Motion being reconsidered, now on the floor:

4.9.6. Move to remove the TClas element and all references thereto from the draft.

4.9.6.1. *Moved Kowalski*

4.9.6.2. *Second Stephens*

4.9.6.3. *Discussion*

4.9.6.3.1. *Presentation of Document 02/349r0*

4.9.6.3.2. *TClas uniquely identifies datagrams and separates prioritized and parameterized datagrams.*

4.9.6.3.3. *Still for the motion – if the classification is above the MAC, the TCLAS mechanism is a special purpose transport to carry control information. Why not use one of the existing mechanism – ethertype or port type? If the classifier is below the MAC SAP, then the MAC is looking into the MSDUs, assuming it knows how to interpret the content. It may be IP, but it may be something else.*

4.9.6.3.4. *Why rule out making the information at the MLME, without getting into specifics. Why do you think a specific ethertype is needed.*

4.9.6.3.5. *Agree that traffic classification is needed – but its not within the MAC.*

4.9.6.3.6. *This does not have to be signaled in the MAC, but since there is no standard method above the MAC, it is needed for interoperability.*

4.9.6.3.7. *This TClas is a kind of insurance to allow us to use parameterized QoS. If we don't have it, we are dependent on some other organization to create the standards to make the higher layer signaling possible and interoperable.*

4.9.6.3.8. *TClas is a signaling protocol for the wireless link. Future protocols could still operate at higher layers.*

4.9.6.3.9. *Is there a solution where the information could be made available to the upper layers (SME) Something above the MAC needs to get the information and act on it.*

4.9.6.3.10. *yes, if you use an existing mechanism such as ethertype, the multiplexing already exists. There is no software existing to use the TClas at the MAC mgmt level.*

4.9.6.3.11. *802.11 does not strictly layer anyway – 802.11i has to look into packets.*

4.9.6.4. *Question called without objection*

4.9.6.5. *Vote on the motion: Fails 19 : 13 : 6*

4.10. Recess for ad-hocs at 5:00PM

5. Thursday Morning TGe, May 16, 2002

5.1. Opening

- 5.1.1. Meeting called to order at 8:10am by John Fakatselis

5.2. Status

- 5.2.1. The agenda of technical items has been completed

5.2.2. Remaining items

5.2.2.1. *We have deferred the motion on the FEC scrambler from yesterday.*

5.2.2.2. *That is the only outstanding item.*

5.2.3. Announcements

5.2.3.1. *There have been complaints that some chairpersons are using instant messages to communicate with members. That gives suspicion to the motives of the chairs. The CAC has decided that chairs will not use instant messages while on the podium.*

5.2.3.2. *The chair apologizes for the intent to allow reconsiderations of motions yesterday. It might be the case that we lost ground rather than gained it. It was perhaps not handled in the best manner. It will not be used as a precedent, and will be more cautious in the future.*

5.2.3.3. *The chair will discuss the issue of new motions on Tclas and Tspecs off-line.*

5.2.3.4. *If this new presentation and motion can be made, it will address the objections resulting from yesterdays motions on TClas.*

5.2.3.5. *The chair asks for any other new topics for discussion at this session.*

5.2.3.5.1. *None*

5.3. Discussion of FEC Scrambler

5.3.1. Update

5.3.1.1. *The presenter wishes to have someone from the winning side ask to reconsider the motion*

5.3.2. Motion to reconsider: "Move to incorporate the normative text in section 2 of 11-02-325r0 into the IEEE 802.11e draft."

5.3.2.1. *Moved Toro Ueda*

5.3.2.2. *Discussion*

5.3.2.2.1. *It is proper to reconsider this motion. Many people did not receive a description of this proposal. This is the classic reason to reconsider – the members have new information.*

- 5.3.2.2.2. *Against the motion to reconsider. This is a sound idea being proposed. The question is whether it is the optimal approach, or the only way. There hasn't been time to consider alternate approaches.*
- 5.3.2.2.3. *The original proposal was presented at the last meeting. Although it has been enhanced, there has been enough time to consider. We need to close out the draft. Doubts there is a better solution.*
- 5.3.2.2.4. *Against the motion to reconsider. Recognize that there is a problem with FEC, and needs to be fixed. This is a new idea. The St Louis document has been reviewed, but it had a problem with the MAC header was scrambled. This new idea that fixes the problem was first seen yesterday. There hasn't been adequate time to consider and evaluate and look for alternatives. Did not know that this was coming up again today. Doesn't want to hold up the letter ballot on this issue.*
- 5.3.2.2.5. *The straw polls indicate that people didn't know how this would work. It is appropriate to reconsider if people had a lack of understanding, and then learn more about it.*
- 5.3.2.2.6. *In favor of the motion – those that are against the motion said they didn't have enough time to find an alternative. You don't need more than one hour to understand the solution.*
- 5.3.2.2.7. *What are the implications if we don't address this?*
- 5.3.2.2.7.1. *The chair states that if we reconsider this and reject it, members have the right to make this issue into comments on letter ballots. This will not stop the letter ballot.*
- 5.3.2.2.8. *In favor of reconsideration – it is a good idea to solve the error.*
- 5.3.2.2.9. *Call the question (Harry / Peter)*
- 5.3.2.2.9.1. *Vote on calling the question: Passes
35: 4: 1*
- 5.3.2.3. *Vote on the motion to reconsider: Fails 21: 20: 11*

5.4. Presentation of Papers

5.4.1. “Consolidated TS Normative Text”, Adrian Stephens

- 5.4.1.1. *Document presentation 02-348r1a*
- 5.4.1.2. *Normative text in 02-348r0*
- 5.4.1.3. *Changes from D2*
- 5.4.1.3.1. *Tspec requested by WSTA, not HC*
- 5.4.1.3.2. *TSPEC is a single link, not WSTA-HC-WSTA.*
- 5.4.1.3.3. *Adds a new section on management of Tspecs.*
- 5.4.1.4. *When can a motion to adopt this text be brought forward? At the 10:30 session*
- 5.4.1.5. *Changes to TSPEC elements*

- 5.4.1.5.1. Deleted source and destination addresses. TSPEC is always a request from WSTA to HC.
- 5.4.1.5.2. Added a direction field. Direction field indicates uplink, downlink, or sidelink.
- 5.4.1.5.3. Add TS and Delete TS action frame formats have a new alternative result code. WSTA asks HC to create traffic stream. The HC can respond with a proposed alternative.
- 5.4.1.5.4. The Tclas element has been denoted as optional. Willing to discuss whether it can be optional or mandatory.
- 5.4.1.5.5. Tidying up of service primitives.
- 5.4.1.6. New section on traffic stream operation
 - 5.4.1.6.1. life cycle of Tspec in MSC syntax.
 - 5.4.1.6.2. Definition of TS timeout – when there is no traffic on the TS.

5.4.2. Discussion

- 5.4.2.1. The HC would be required to receive the element, but the station would optionally implement.
- 5.4.2.2. In general this is the right track. In the Tspec element, the delay bound and jitter were deleted – how does this work?
 - 5.4.2.2.1. Is there an accepted comment resolution that deletes delay bound and jitter? No. Then that is a mistake in this document.
- 5.4.2.3. Could this motion be deferred until 3:30? Then changes have to be on the server by 11:30am. The chair prefers to have this done by noon. The editorial team needs to have time to implement.
- 5.4.2.4. This is complicated enough that we should put it off until the next meeting. The complexity is too high to review in real time.
- 5.4.2.5. Tspec is the core of TGe draft. We need to be careful about what we change. Suggest we defer until the next meeting.
- 5.4.2.6. Agree that we should delay. There are very good things in this document, and support it. But we have concerns that might not be able to be addressed in the next couple of hours.
- 5.4.2.7. If we don't put this in the draft, will have to address the same set of comments. Thinks it should be in the draft.
- 5.4.2.8. There are some questions and comments – if we would like to go to letter ballot, we should adopt this. We need to incorporate this, but we haven't had enough chance to review.

5.4.3. Straw Poll

- 5.4.3.1. Should we try to include this in the draft this week for the Letter Ballot. 14 votes

5.4.3.2. *How many wish to postpone till later? 8 votes*

5.4.3.3. *How many have no opinion 7 votes*

5.4.4. Discussion

5.4.4.1. *If we get the right people together, we can work this out and have a draft with the issues resolved.*

5.4.4.2. *The people need to get together right now.*

5.4.4.3. *Suggest forming an ad-hoc committee on this subject to run until the next meeting.*

5.4.4.4. *We want to make the draft complete, and also get it out this week. However, once we vote it in, it also takes 75% to take out or fix it.*

5.4.4.5. *Are there any subsets of the paper that could be taken as separate motions?*

5.4.4.6. *Adrian is trying to accomplish a number of things. Tidying up, describing things that need description. But there is also a change in what the TSPEC negotiates. That would be the only technical item that could be debated.*

5.4.4.7. *The draft already says negotiation is for one link, not multiple. Look in 2.0a – there was bi-directional, but it was removed.*

5.4.4.8. *How do you set up STA-HC-STA? It takes two TSPEC negotiations. Trying to negotiate both at once is a problem.*

5.4.4.9. *Adrian is allowed to make a motion after 10:30.*

5.4.4.10. *The chair would like to discuss the technical merits of the paper.*

5.4.5. Discussion of technical issues

5.4.5.1. *Consider the case that the link quality goes from good to bad.*

5.4.5.2. *For a side link, returning a QoS Nul is also considered inactivity.*

5.4.5.3. *How does the HC know the difference between a station not having enough time to send, or not having any data? Add text including the queue size field.*

5.4.5.4. *Questions whether we can make it mandatory to have all stations include a classifier capable of using the Tclas element.*

5.4.5.4.1. *Is it reasonable for a device to not support classification?*

5.4.5.4.2. *We are force to require all stations and HC to support Tclas elements. We need a specific statement to mandate it.*

5.4.5.4.3. *But we are a MAC, and trying to require that classifiers exist above us on the stack.*

5.4.5.4.4. *We could make the ability to receive Tclas and indicate to higher layers mandatory.*

5.4.5.5. *The receiving station will receive frames containing a TSID in a side link. It doesn't have to do anything special with them.*

5.4.5.6. *The issues with the side link are knowing the station is there and its capabilities – the WARP protocol provides this.*

5.4.5.7. *How do you do TSID assignment? The WSTA chooses.*

5.4.5.8. *This proposal supports up to 8 outbound and 8 inbound streams.*

5.4.6. Closing

5.4.6.1. *There appears to be no strong objection to the general concept.*

5.4.6.2. *The update to the document will be on the server by 10:30, and available to vote this afternoon.*

5.4.6.3. *The motion will be addressed at 10:30, then we will recess for members to review the draft. We will reconvene at 3:30 to approve the draft.*

5.5. Recess at 10:00am

5.6. Call to order at 10:30AM

5.7. Presentation of Papers

5.7.1. **“TXOP Request: in time vs. in queue size” Sunghyun Choi**

5.7.2. **Document 02/314r1**

5.7.3. **Overview**

5.7.3.1. *QoS control field has two mechanisms to set up stream.*

5.7.3.2. *The group concluded that requesting TXOP in time is not a good idea- a scheduling algorithm based on time requests cannot be optimal*

5.7.3.3. *Wants to remove the option to request TXOP by time.*

5.7.4. **Discussion**

5.7.4.1. *Why can't the HC just trust the station to request what it wants. This makes assumptions for particular applications. Some applications have time as a natural expression.*

5.7.4.2. *There has to be a way to translate from octets to time anyway. This does not add complexity.*

5.7.4.3. *There are cases where it is appropriate to have a more deterministic use of the resource, and even over-allocation.*

5.7.4.4. *The applications may have a better idea of their requirements than the HC.*

5.7.5. Straw Poll

5.7.5.1. Do you favor two methods (bytes & time) for TXOP request? 8 votes

5.7.5.2. Do you favor TXOP only in bytes (queue size)? 19 votes

5.7.5.3. Do you favor TXOP only in time? 0 votes

5.7.6. Move to remove “TXOP duration request” in the QoS Control field and all the references from the 802.11e draft

5.7.6.1. Moved Sunghyun

5.7.6.2. Moved John Kowalski

5.7.6.3. Discussion

5.7.6.3.1. None

5.7.6.4. Vote on the motion: Fails 20: 7 : 2

5.7.6.5. Recount: Fails 20: 9 : 2

5.8. Express Data**5.8.1. Discussion**

5.8.1.1. Thinking more about the express data class – worried about it. The HC needs strong control over the medium. Express Data may hijack the medium without knowledge of the HC. It is an attempt to get around what the scheduler should be doing.

5.8.1.2. The other view is not that it hijacks the medium, but that it allows applications that know more about their requirements than the HC could ever know. It is a tool to enable applications that the HC could not do as good of a job.

5.8.1.3. We still need normative requirements on the scheduler.

5.8.2. Straw Poll

5.8.2.1. I want the Express Data Class to remain in the draft. 3 votes

5.8.2.2. I want the Express Data Class removed from the draft 18 votes

5.8.2.3. Don't know / don't care. 3 votes

5.8.3. Motion – to remove the express data class from the draft.

5.8.3.1. John Kowalski

5.8.3.2. Point of order – the motion was to incorporate normative text (including express data) into a draft A draft has not been published. This is out of order.

5.8.3.3. Previous motion withdrawn before seconding.

5.8.4. Motion – to rescind the motion 9.1.2.5 from November 2001: “instruct the editor to incorporate the normative text in document 01/597r1 into the draft”

5.8.4.1. Moved John Kowalski

- 5.8.4.2. *Second Peter E*
 - 5.8.4.3. *Move to table the motion*
 - 5.8.4.3.1. *Moved Peter J*
 - 5.8.4.4. *5 minute recess*
 - 5.8.4.4.1. *Seconded Adrian Stephens*
 - 5.8.4.4.2. *Vote on motion to table: Fails 8 : 17 : 3*
 - 5.8.4.5. *Discussion on motion to rescind*
 - 5.8.4.5.1. *Against the motion – this is a complex matter that has not been reviewed. Things don't get reviewed until they are in the draft. There are important features in this document.*
 - 5.8.4.5.2. *Would like to present a document on the queue state element – it asks questions on the queue state element, and overview.*
 - 5.8.4.5.2.1. *How does it relate to the motion on the floor?*
 - 5.8.4.5.2.2. *This paper shows why the motion should be rescinded.*
 - 5.8.4.5.2.3. *Document 02/130r0*
- 5.8.5. **Recess at 12:00 noon**

6. Thursday Afternoon TGe, May 16, 2002

6.1. Opening

- 6.1.1. **The meeting is called to order at 3:30 by John Fakatselis**

6.2. Continuing from previous session

- 6.2.1.1. *Discussion on motion to rescind*
- 6.2.1.2. *Continued discussion of presentation in document 02/130r0.*
 - 6.2.1.2.1. *For wireless 1394 – all data is in express traffic.*
 - 6.2.1.2.2. *Queue size in time not bytes is a virtue, not a problem.*
 - 6.2.1.2.3. *The MAC does not do admission control – admissions are already going through the MAC, but are expected to go in L3 datagrams. There is no fundamental difference between Tspec and Qstate.*
 - 6.2.1.2.4. *A response is not needed to the Report Qstate, since it is already arranged.*
 - 6.2.1.2.5. *Although the MAC doesn't handle admission control, there is still a need of a standard admission control entity. That entity talks to the MAC and reserves time. There is always the need for a central admission controller, so you don't oversubscribe time or bandwidth.*
 - 6.2.1.2.6. *One reason there is no response frame is because there is very little to do with the response. The qstate indicates the current state of the queues. Reporting that the desired operation can't be done is unnecessary.*

- 6.2.1.2.7. *Would like to have admissions control in the MAC.*
- 6.2.1.3. *Move to limit discussion to 15 minutes.*
 - 6.2.1.3.1. *Keith*
 - 6.2.1.3.2. *No objections*
- 6.2.1.4. *Discussion*
 - 6.2.1.4.1. *There is a misunderstanding of the use of QSE at high priority – they are like any other message*
 - 6.2.1.4.2. *What is the resolution of queue length to time?*
 - 6.2.1.4.3. *The problem with the express data class is that you can't insure that there won't be something else that uses the same mechanism and conflicts with it. It must integrate with other applications*
 - 6.2.1.4.4. *Agrees that we need to sort out admission control and put it in the MAC. Thought that this group didn't want to deal with admission control, but it is not an argument to remove qstate from the MAC.*
 - 6.2.1.4.5. *Will this prevent the use of wireless 1394 if it passes? This document was from the 1394 association. It would seriously impede the support of 1394 in 802.11e.*
- 6.2.1.5. *Call the question – no objections.*
- 6.2.1.6. *Vote on the motion to rescind: Passes 29 : 8 : 7*
- 6.2.2. Motion: to instruct the editor to include normative text defined by 02/348r1 into the TGe draft.**
 - 6.2.2.1. *Moved Adrian Stephens*
 - 6.2.2.2. *Discussion*
 - 6.2.2.2.1. *This is a modification to the document presented earlier today*
 - 6.2.2.2.2. *Differences*
 - 6.2.2.2.3. *Supports 8 downlinks and 8 up/side links*
 - 6.2.2.2.4. *The HC must support sending and receiving Tclass elements*
 - 6.2.2.3. *Straw Poll –*
 - 6.2.2.3.1. *how many had time to review the document?*
11
 - 6.2.2.3.2. *How many did not have an opportunity to adequately review? 10*
 - 6.2.2.3.3. *How many would not review it? 1*
 - 6.2.2.4. *Second Srimi*
 - 6.2.2.5. *Discussion*
 - 6.2.2.5.1. *Move to limit debate and fix the vote at 4:25. Accepted with no objection. Each individual gets one minute*
 - 6.2.2.5.2. *In favor of this – it adds a lot of detail that was not there before. It is better than what it replaces.*
 - 6.2.2.5.3. *In favor of this – this is the best way to use Tspecs.*

6.2.2.6. *Vote on the motion – any objection to adopting by unanimous consent? None*

6.2.2.6.1. *Motion accepted by unanimous consent.*

6.2.3. Motion: remove the text “that initiated the frame exchange sequence” from the first sentence of clause 7.1.3.1.7 which states, “The Power Management field is 1 bit in length and is used to indicate the power management mode of the (Q)STA that initiated the frame exchange sequence”

6.2.3.1. *Moved Keith Amman*

6.2.3.2. *Second Duncan Kitchin*

6.2.3.3. *Discussion*

6.2.3.3.1. *Support this change – it was an incorrect comment resolution.*

6.2.3.4. *Vote on the motion: Passes 31: 0: 1*

6.2.4. Closing discussion

6.2.4.1. *Would like to return to the FEC issue. People want to solve the problem and keep FEC in the draft. There was concern that there wasn't time to review this. Another option would be to revive the FEC Ad Hoc group to work between sessions and come back with a solution.*

6.2.4.2. *Who would like to lead this teleconference? Lior volunteers.*

6.2.4.3. *We will hold teleconferences once a week.*

6.3. Next session

6.3.1. **There is a scheduled vote at 8:30 to vote to send the draft out to letter ballot.**

6.3.2. **The draft presentation starts at 7:30PM. Around 8:00pm is when the vote is likely to take place.**

6.3.3. **Move to recess until 7:30PM (Duncan) – no objection.**

6.4. Recess at 4:30PM

7. Thursday Evening TGe, May 16, 2002

7.1. Opening

7.1.1. **The meeting is called to order at 7:30 by John Fakatselis**

7.1.2. **Agenda review**

7.1.2.1. *A fixed time to review the draft*

7.1.2.2. *Make motions for accepting the draft and forward to letter ballot*

7.1.3. **Presentation**

7.1.3.1. *“802.11 WG Assigned Numbers Authority”*

7.1.3.1.1. *Duncan Kitchin*

- 7.1.3.1.2. *We have a problem with ID numbers and capability bits that are selected by the TGs, and they are colliding.*
- 7.1.3.1.3. *Proposal to create a single person to own all the numbers, and a mechanism to assign them.*
- 7.1.3.1.4. *Will ask the chair to assign a member to run this, and a web document to contain all the numbers.*
- 7.1.3.1.5. *The Task Groups will make motions to request numbers.*
- 7.1.3.1.6. *The last number of any resource will be reserved as an "escape bit" to extend the space.*
- 7.1.3.1.7. *There will be an appeal mechanism with a time limit.*
- 7.1.3.1.8. *Initially covering element IDs, management frame action codes and capability bits. Can be extended by a motion.*
- 7.1.3.2. **Discussion**
 - 7.1.3.2.1. *This needs to allow for provisional assignment. A mechanism is also needed to return the numbers if the mechanism is later removed.*
 - 7.1.3.2.2. *Can this be automated?*
 - 7.1.3.2.3. *Also the status and result codes might need to be added.*
 - 7.1.3.2.4. *Automating this is probably not the best idea.*
 - 7.1.3.2.5. *One of the other issues is the ordering of elements in management frames. Could the ordering also be made the same as the order of ID codes, solving that issue?*

7.2. Review of the Draft

7.2.1. Presentation of the draft

- 7.2.1.1. *Draft 802.11e-D2.22*
- 7.2.1.2. *The editor Srinivas Kandadas reviews all the changes in the draft for the group.*

7.2.2. Discussion on the draft

- 7.2.2.1. *Did some people review the draft in the last few hours? Yes, some did, but not totally.*
- 7.2.2.2. *How many voting members? About 30.*
- 7.2.2.3. *Does this draft purport to address all technical comments? To the best of our knowledge. We addressed about 1600 comments. Some editorial comments have not been resolved because we ran out of time.*
- 7.2.2.4. *What is the final count of the comments that were addressed? In 084r14?*
- 7.2.2.5. *Are there any TBDs in the draft? As far as we know there are none. There was one place where a new notation was called for and we left it.*

- 7.2.2.6. *We are at the state where different people read the document and have different interpretations. If you have the luxury of time, you have a person work on the wording to make it comprehensible. The baseline document is also very hard to understand. But nobody has ever gone through a readability quality improvement process on the base standard or any of the supplements currently being developed. We have failed to grasp how to make this document maintainable for many years. Somebody in IEEE will have to merge all these supplements into a single document, which will be a daunting task. How do we as a WG make the end result more readable and maintainable?*
- 7.2.2.7. *Status of comments – out of 1300 comments, we have resolved 1000 or more (due to duplicates). Probably closer to 1200 comments have been resolved.*
- 7.2.2.8. *The chair notes that we are not obligated to answer every comment. We just need to produce a better draft. Some comments are unresolvable.*
- 7.2.2.9. *If there are a significant number of outstanding comments (over 100) we might benefit from having a delay of a few weeks to allow the draft to be reviewed before starting another LB. We might have a better result if we slow down at the moment.*

7.3. Motions to adopt the draft

- 7.3.1. **Motion: Instruct the editor to issue a new revision of draft as 3.0, including the changes agreed by TGe up to the end of the Sydney meeting, and presented as draft 2.23.**
- 7.3.1.1. *Moved John Kowalski*
- 7.3.1.2. *Second Adrian Stephens*
- 7.3.1.3. *Vote – Passes 33 : 0 : 1*
- 7.3.2. **Motion: Request the WG to issue a 40 day letter ballot, which may be conducted by electronic means, asking the WG whether to forward 802.11e draft 3.0 to sponsor ballot, asking the sponsor group ask the IEEE–SA to adopt 802.11e draft 3.0 as standard supplement 802.11e.**
- 7.3.2.1. *Discussion*
- 7.3.2.1.1. *If we start before May 28th, the LB will close before the next meeting.*
- 7.3.2.2. *Moved John Kowalski*
- 7.3.2.3. *Second Adrian Stephens*
- 7.3.2.4. *Vote – 32 : 0 : 2*
- 7.3.3. **Discussion**
- 7.3.3.1. *The 802.11i group is using an automated tool ? Could we use it?*
- 7.3.3.2. *Several members feel the tool is detestable.*

7.3.3.3. *The chair will consult with the other chairs and editors on this.*

7.4. Old Business

7.4.1. None

7.5. New Business

7.5.1. The group wishes to thank the Editor, Srinu Kandalas, for his hard work during this week in making the new draft possible.

7.5.2. The group also thanks Keith Amman for maintaining the comments list for several months.

7.5.3. The editor also thanks the team of sub-editors for their help.

7.6. Motion to adjourn – no objections.

7.7. The meeting is adjourned at 8:30PM.

8.

**IEEE P802.11
Wireless LANs**

May 2002 Sydney Interim TGg Meeting Minutes

Date: May 13-17, 2002

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Abstract

Minutes

2002-05-13 10:40AM

The chair asked for a volunteer for secretary. Kevin Smart volunteered.

The chair called the meeting to order.

The tentative agenda was shown in document 02/288r0

The chair presented his chair's status update (02/307r0). He glossed over several parts because this is history. There were three new participants in TGg, so they were advised to read the document on the server. Document 02/203 has the comments with the resolutions. We would like to complete the comment resolution and perhaps have another letter ballot after this meeting.

The five special committee chairs from the previous meeting all agreed that they would be able to fulfil their duties this week.

The chair went over the proposed agenda. Submissions are in order, but they should wait until we are working the the section where it is applicable.

Terry Cole made the motion to adopt the proposed agenda.
Dick Allen seconded.

Sean Coffey wanted to know how much time we had for dinner. Matthew has reserved 90 minutes for dinner each night.

Carl pointed out that we are recessing for dinner twice (the second one is at 9:30). We proposed replacing that with a bar. Matthew agreed to correct that flaw.

The document was changed to 288r1 with the corrections. Adopted by unanimous consent.

The modified agenda (02/288r1) was adopted by unanimous consent.

Motion: Move to adopt the minutes from the St. Louis Plenary (02/164r0)
Moved: Stuart Kerry

Seconded: Srikanth Gumatti

Count: 24/0/0 Motion is adopted and the minutes were adopted.

The chair is making a call for submissions. Terry Cole has documents 299, 300, and 301. Steve Halford also has a document without a number (Title: Spectral Control Issues).

This is **not** the last call for submissions. There will be another call and offline notices are also in order.

There are a couple of options to proceed. We agreed to have Steve Halford continue where we left off in March.

Steve Halford will edit 02/209r5 (the comment resolution spread sheet).

Comment numbers are the line numbers of the Clause 19 tab.

Comment 16: Change the silent extension to non-silent. The proposed resolution is to not make any changes.

Kevin Smart pointed out that other non-802.11 devices may have problems with the non-silent extension. He made no proposal, but pointed out some of the issues.

The proposed resolution was adopted by unanimous consent.

Comment 17: The group agreed that there was no change required.

Richard Williams said that the text was changed so that it was clarified. This note was included in the resolution. Therefore, we are referring them to the revised subclause 19.4.5 (the CCA clause).

This resolution was adopted by unanimous consent.

Comment 18: The comment was rejected because the document states that regulatory requirements must be met. There we no changes needed. We asked Al Petrick (the commentor) if this resolves his issue. Al put that comment in there because the .11b document references the FCC document. He is requesting the reference be included in the draft. Editor: 19.4.3.8.1 now calls out the FCC document that needs to be referenced. This seems to resolve the issue. The commentor was satisfied, so the resolution was adopted by unanimous consent.

Comment 19: Similar to 18, the resolution is the same as 18. No discussion. Everyone feels that this is the same as 18. This is adopted by unanimous consent.

Comment 20: No change was required. Adopted by unanimous consent.

Comment 21: Adjacent channel issues. The text was modified that this comment should be resolved. There is a document that will be presented that may clarify this issue. We are going to wate for Steve Halford's paper until we resolve this.

Comment 22: There as a new section added 19.4.3.8.6 that should satisfy the commentor. This was adopted by unanimous consent.

Comment 23: There was an error in this comment because the things they were complaining about did actually exist. The resolution was adopted by unanimous consent.

Comment 24: Postponed until the joint meeting with TGe.

Comment 25: Steve is willing to reject the comment until he has the required data to present. We adopted the "no change recommended" by unanimous consent.

Comment 26: Held for the joint meeting with TG3.

Comment 27: No changes were made. Adopted by unanimous consent.

Recessed for lunch.

2002-05-13 1:15 PM

The meeting was called to order. Steve continued on reviewing the suggested changes.

Comment 28: Short preamble should be optional.

Comments 29 through 36 are the same.

Jan Boer: Thinks that the short preamble should be optional.

Sean Coffey: The .11b mandatory modes are mandatory for .11g as well. The .11b part should operate as efficiently as possible, so the short preamble should be made mandatory.

Jan Boer: Where it might hurt is when working with .11b only networks. This doesn't help anything.

Terry Cole: The text has been greatly improved since draft 2.0.

Chris Heegard: You can still work in a .11b network with the long preamble.

Jan: We should take the straw poll and see if I am the only one.

Terry: There were several comments that we should always use the short preamble and no long.

Straw poll: Leave the long and short as mandatory or make the short preamble optional.

Leave the long and short as mandatory

13

Make short preamble optional.

3

Terry Cole: Are we missing something? Do the other people not care?

Chair: I believe they don't care.

Sean Coffey: Let's have more discussion.

No one else wanted to discuss the preambles, so we adopted the resolution by unanimous consent. (28-36)

Comment 37: Remove optional modulation types. This was discussed in General Comment row 11. The straw poll didn't show the necessary 75% for removal. This was resolved as before.

Comment 38: It is unclear what the maximum signal level that can be tolerated.

Straw poll: 1) Use -20dBm as the limit for all modulations or 2) Use -10 dBm for 1, 2, 5.5, and 11

Carl Andren: Perhaps we should have -10 dBm for OFDM modes as well.

Richard Williams: 1, 2 have a -4 dBm limit in 802.11.

Steve Halford: That was relaxed for .11b.

Matthew Shoemake: That is the way I understand it as well.

Two separate straw polls:

OFDM modes: Should the draft remain the same as it is now at -20 dBm or should it be raised to -10 dBm?

-20 dBm:

15
-10 dBm:
0

Non-OFDM modes (Barker, CCK, and PBCC): Would you like to see the maximum stay at -20 dBm or at -10 dBm?

-20 dBm:
11
-10 dBm
4

Based on the straw poll, the majority would like to see it stay where it is right now. We resolved this comment with this straw poll result by unanimous consent.

This resolution covers several comments (38-49). Adopted by unanimous consent.

Comment 50: Bluetooth interference issues.

Kevin Smart: I believe that we discussed some of these coexistence issues at last meeting.

Sean Coffey: 802.15.2 is only talking .11b and Bluetooth

Dick: If they are only talking .11b and Bluetooth, we should request they include the OFDM waveforms as well.

John Terry: The FCC just made some changes to allow for adaptive hopping to allow for better coexistence.

Matthew Shoemake: I had an action to talk with Bob Heile about coexistence. I talked with Stuart and the coexistence issue has been raised higher. RevCom is now going to make sure that 802 devices will coexist with each other.

Sean Coffey: Can you define the term "Coexist"? A lot of us has been discussing coexistence, so we should be able to have some input on the coexistence issues. We need the opportunity to respond to their issues.

Matthew Shoemake: Should we talk this over with Stuart?

Sean Coffey: If there is going to be a policy, we need to be able to respond. We also need to know what the definitions of the terms are.

Matthew: We should bring Stuart in to discuss this before we ignore this comment.

We are leaving 50 for now

Comment 51: Changed to editorial and resolved as editorial. Adopted by unanimous consent.

Comment 52: Text changed. Adopted by unanimous consent.

Comment 53: Frequencies were changed to the appropriate Japanese frequencies. Adopted by unanimous consent.

Al Petrick came in to talk about the coexistence. We now have .11, .15, and .16. RevCom is concerned that we will not coexist. We are looking into forming a group to discuss the coexistence issues. On Friday we will bring this up as a

Sean Coffey: I felt that this group should have a say in the coexistence. I am confused with the definition of coexistence. I want to see what we are required to do in writing. I understand that Jim Lansford is the chair of some group (TAG).

Al Petrick: This group will have a voice in coexistence. We will have a voice in resolving the issues with RevCom.

Terry Cole: Do you think that such policies will affect .11g in moving forward?

Al: We want to understand what the real issues are. We want to get to the bottom of that now so that we can keep moving forward. We would like to have all three groups agree on what we do so we can continue.

There will probably be a group that is formed to solve this problem. We don't want to slow down any group. This week is primarily information gathering. There may be some vote in Vancouver.

Sean Coffey: All three groups may have different proposals.

Al: We want to stop any bottlenecks.

Jim Zyren: There is a big difference between .15 and Bluetooth. Bluetooth is being built, but .15 is not.

Dick: I agree with Jim Z., but the Bluetooth group will be at the 0.5 version of the adaptive hopping. They should complete their work by the first of next year.

Continuing on.....

Comment 50. How do we move forward since we just had that discussion.

Jim Z.: We need to ensure that the .11g can stand on its own without knowing the policy.

Dick: We should be proactive and request 802.15.2 to include .11g waveforms. Then we could know the impact. If we don't do anything, we may get the draft thrown back to us. This can solve the problem before.

Chair: We want

Dick: We are the new kid on the block. 15.1 and .11b has been studied. We already know what is recommended. We should leverage that work and get some .11g waveforms included.

Sean: How long has .15.2 been around? 2 years. Why should this group wait?

Dick: We should do something before revcom throws it back at us. We should try to buy some insurance.

Jim Z.: We should leverage adaptive frequency hopping. Perhaps we should ask .15 to use AFH to help solve this problem. Are they proposing AFH? Yes. Could we address this by requesting 802.15.2 to look at 802.11g. Perhaps it is simple "the same as."

Do we want to officially request 802.15 to do something with the 802.11g PHY? Perhaps we should have a motion.

Jim: We should let 802 guide us in the future.

We resolved question 50 by stating that the coexistence policy is being established.

Comment 54: 19.4.3.8.6 seems to resolve this comment (except for the picture request). This seems to satisfy 54-58.

Richard Williams: We are establishing a policy in length based on the preamble type...

The length is calculated differently for OFDM packets and CCK-OFDM packets

Richard and Carl had a discussion to clarify the misunderstanding. Carl requested Richard to come up with some test to clarify this.

The resolution is resolved by the changes in 19.4.3.8.6.

Adopted by unanimous consent.

Comment 59: Editor has made the corrections. Adopted by unanimous consent.

Richard Williams: 19.4.3.10 may have a similar problem.

Comment 60: Editor references table 115 in 18.4.7.1

Chair: The comment wants a minimal power level

Assume that he meant maximum because minimum doesn't make sense.

Resolution adopted by unanimous consent.

Comment 61: Editor removed the CCK-OFDM reference. Adopted by unanimous consent.

Comment 62: The editor referenced FCC as an example and said that all regulatory domain information needs to be followed. This was adopted by unanimous consent.

Comment 63: Editor looked and fixed. Adopted by unanimous consent.

Comment 64: Same as 62. Comment 65 is a duplicate.

Comment 66: Changed to editorial and completed as suggested. Adopted by unanimous consent.

Comment 67 is the same.

Comment 68: Added units and removed.

Comment 69: Adopted the comment as suggested.

2002-05-13 3:00 PM Recessed

2002-05-13 3:37 PM

Meeting called to back to order

The network is having a problem due to the limited bandwidth. Terry Cole will put together a flash with the documents.

Comment 70: Comment changed to editorial and fixed by the editor. No objections.

Comment 71: is the same as 70.

Comments 72-75 Changed to editorial and modified as suggested. No objections.

Comment 76: Changed to editorial. Editor fixed the problem. No objections.

Comment 77-78: Changed to editorial. Editor fixed the problem. No objections.

Comment 79 is similar but was still fixed by unanimous consent.

Comment 80-82: Editor fixed the reference. Resolved by unanimous consent.

Comment 83: Same as 80-82. Fixed the reference from 9.3.2.2 to 9.2.1. Resolved by unanimous consent.

Comment 84, 86, 88, 90: Clarifying text was added. Resolved by unanimous consent.

Comment 85, 87, 89, 91: A new section was created with adjacent channel rejection (19.4.3.10.2). The group felt that this resolved the comment. Resolved by unanimous consent.

Comment 92: 19.4.3.9 talks about the spectral mask and the regulatory requirements. We are required to follow whichever is more restrictive. Richard Williams (commentor) said that he wanted some redundancy to clarify for end users. The editor will take that as an advisement and add some text to resolve this. Accepted by unanimous consent.

Comment 93: Comment accepted by editorial change. Done by unanimous consent.

Comment 94: Requesting some redundancy. Switched to an editorial comment. Editor is advised to resolve as 92. The editor believes this is done. Done by unanimous consent.

Comment 95: Comment was taken and the paragraph was modified. Done by unanimous consent.

Comment 96: Reference was corrected. Done by unanimous consent.

Comment 97: Text should be added to clarify this issue. Done by unanimous consent.

Comment 98: The comment was accepted and text has been modified. Done by unanimous consent.

Comment 99, 100, 101: The last sentence was removed as suggested. Done by unanimous consent.

Comment 102: CCK-OFDM reference was removed. Resolution adopted by unanimous consent.

Comment 103: Similar to 102. CCK-OFDM was removed. Resolved by unanimous consent.

Comment 104: Comment accepted and correction was adopted.

Comment 105: Project underway in Europe to make sure that OFDM is acceptable in the 2.4 GHz band. Jim Z: doesn't think that the ETSI rules pose any problem to adoption in .11g. Blown off by unanimous consent.

Comment 106: The paragraph in question was extensively modified. This comment was covered by the changes. Adopted by unanimous consent.

Comment 107: The editor added a reference to Table 115 which should solve the problem. Adopted by unanimous consent.

Comment 108: Copied the resolution to Comment 50 of this section. This was adopted by unanimous consent.

Comment 109: Similar to 108, but more general in that it deals with the coexistence. We will deal with this as a coexistence issue like we did earlier. See resolution to comment 50.

Sean Coffey: This is an extreme position. It is ridiculous that we can work with something that has not been finalized. We don't necessarily agree with this comment. Opinions vary widely. We can't just address this comment because there is a wide spectrum of opinion. We are also awaiting guidance from IEEE 802;

Dick: Isn't it dangerous to say that we can't resolve these things.

Sean: Is is a requirement to have everything resolved.

Dick: We should just say that we have resolved the issue and not leave the door open.

Terry: Jim said "we are going to go ahead and we expect 802 to craft a policy that will protect .11g" I agree with that.

Chair: We all agree we need to take a hard line.

Jim: Perhaps we should craft some words to support our stance. 802 has to protect the existing standards. Suggest resolution "There is no 802 policy that requires action from the task group at this time"

Dick: We should refer to the 802.15.2 coexistence document.

Steve: It isn't an approved draft.

Dick: We believe that the current position of the 802.15.2 draft facilitates coexistence with approved standards.

Dick: We believe we have adequately addressed the coexistence issue.

John Terry: This wording may not change the vote because if there is nothing to force the change.

Chair: Doesn't 802.15.2 weaken our position?

Jim: We should say that it isn't part of our PAR. There is no requirement to reference coexistence.

This was adopted by unanimous consent and will be copied into the other coexistence related comment resolutions.

Comment 110-113: Moved to the MAC subcommittee.

Comment 114, 115: Editor addressed that in 19.6.4.4. This was resolved as an editorial comment. Adopted by unanimous consent.

Comment 116: Resolved by General Comment 13. Done by unanimous consent.

Comment 117-118: Moved to MAC subcommittee:

Comment 119: Moved to options

Comment 120: Tie this to general comment 25 and proceed.

Comment 121: Postponed based on a potential paper presentation.

Comment 122: No change necessary. This comment seems to run counter to the spirit of this TG. This resolution was done by unanimous consent.

2002-05-13 5:24 PM

Recessed for dinner

2002-05-13 7:11 PM

Called the meeting back to order.

Steve is continuing on with his fearless leadership.

Starting to work with 209r6 (209r5 was put on the server as a snapshot of our work).

Comments 123-139: Steve would like to hold off until his presentation regarding adjacent channel information.

Richard: Does the comment mean that .11b doesn't work with .11b? It seems confusing.

Comment 131 is a little different. Al Petrick would like to see a picture to show how the spacing and mask should work. This is somewhat driven by the work in .11b. He would like to show how .11b and .11g masks relate to each other and how things are going to work together. We haven't given the explicit spacing and mask (although it is implicit). Al has agreed to let us handle this comment with the other channel mask comments.

Comment 140: There is only one mandatory mode. No change was adopted by unanimous consent.

Comment 141: No change required. Refer to General Comment 25. Done by unanimous consent.

Comment 142: The editor believes that he has clarified the CCA paragraphs. See 19.3.7, 19.4.5, etc. We will resolve this comment based on those references.

Richard Williams: What is CCA mode 2?

Editor: Yes, there is an inconsistency. The editor will address this in a future revision.

We will resolve this with these modifications. We agreed to resolve this by unanimous consent.

Comment 143: This is now defined with the CCA modifications. (19.4.5) Resolved by unanimous consent.

Comment 144: More CCA. Similar to 142. Resolution is identical. Resolved by unanimous consent.

Comment 145: This is resolved in 19.4.5. We want to keep things away from detecting a microwave oven. This resolution may need to change based on their comment. This document doesn't say that it uses .11a. Perhaps we should point out that we do not use clause 17 CCA. CCA is one of those exceptions. This requires no change. Clarify the CCA exception with a reference. Mark Webster: How do we define carrier sense? It wasn't defined in .11a, so we need to solve this inconsistency. The editor will ensure that the CCA mechanism is clarified. Carrier sense also needs to be defined.

Mark Webster: Carrier Sense? For legacy systems it is the Barker patterns. For OFDM we use the preambles. We can use the short and/or long preamble.

This was resolved by unanimous consent.

Srikanth: Will be have the opportunity to comment on the editor's changes so we can have comments on the editor's comments.

Editor: We can go through the changes so people can see the changes.

Chair: We will try to do that.

Srikanth: We will call it resolved until we can review it later.

Once again it was resolved by unanimous consent.

Comments 146-148: Resolved by 144. Done by unanimous consent.

Comment 149: Carl was happy with the text. Done by unanimous consent.

Comment 150: We believe this is a CCA issue. Copy the comment from 148. Done by unanimous consent.

Comment 151: We believe this is a CCA question. Copied the comment resolution. Done by unanimous consent.

Comment 152: The comment was accepted and the text was modified. Done by unanimous consent.

Comment 153: Similar to 152, so the same resolution is appropriate. CCK-OFDM is missing. Section 19.6.2.5 is where some of the information lives. Done by unanimous consent.

Comment 154: Similar to 92. Follow the same resolution to 92. Done by unanimous consent.

Chair wants to know who wants to go for another hour. No one was awake to say they want to continue working. We recessed for the evening.

2002-05-13 8:25 PM.

We dismissed for the night.

2002-05-14 1:07 PM

Called the meeting to order

Chair has more information regarding coexistence. There will be some activity at the higher levels of 802 regarding coexistence. Bob Heile wants to have a representative of TGg to meet and have a preliminary discussion of coexistence. The chair is looking for a person. Sean Coffey was interested in doing something like that yesterday. The chair needs to bring our choice at 3:00 PM to Bob later today.

Looking for discussion regarding the member who should attend that group.

Sean Coffey was elected by unanimous consent.

The chair would like to jump into comment resolution. The next group would be to look at non-clause 19 and appendicies. Terry Cole wasn't present, so John Terry went looking for Terry Cole to lead our discussion.

The chair is looking for submissions during the joint session with TGe. Also looking for other submissions. Steve Halford will be ready to present later this afternoon. Carl Andren is looking at the server for other possible submissions.

We are ready to start working on the "Non-clause 19 & Appendicies" tab in 02/209r7. The discussion is being led by Terry Cole.

Starting with 02/299r0 to assist with the comment resolution.

Comments 2-8: We need new modulation types. He suggested adding OFDM and CCK-OFDM into 10.4.2 and 19.4.4.

Richard Williams: ERP-PBCC shouldn't it just be PBCC?

We modified it to just being PBCC.

The text was updated. We are adopting the proposed changes by unanimous consent.

How is 7.3.1.4 comments related? The two sections are related through the corrected tables.

There was a reminder to sign the e-Attendance book.

Comments 83,84, and 85: relate to how CCK-OFDM and OFDM have the same codes. There is a comment to that effect in 19.6. Which is better? To uniquely define the codes for OFDM and CCK-OFDM? Or to do things separately.

Discussion:

Richard Williams: Is the reason this doesn't arise in .11b?

In 802.11b there is 11 Mbps CCK and PBCC, how is is resolved?

Chris Heegard: In 11b the rate doesn't specify the modulation? It is the same situation here. Don't we support rates and modulations.

Marty: Yes, we only have rate and not modulations.

Chris: That is lame.

Richard: The commentor is saying that 802.11b has this problem.

Terry: He is commenting on 802.11g, but he may have run into it in .11b.

Terry: We didn't see any clear advantage, so we are asking for a straw poll.

Chair: Does the resolution to this affect the resolution to other comments?

Terry: No, I don't think so.

Capability Information field specifies modulation type.

Chris: I don't think it is a big restriction.

Terry: We thought it was worth doing something. That is why we give are g

Chris: Arguing that something should more general doesn't seem to do anything.

In 19.6, we have modified the text so that the same CCK-OFDM and OFDM rates will be supported.

This was accepted by unanimous consent.

Comments 10 & 11: Support Rate element. It currently supports up to 8 rates, so there is a problem or a limitation. There are as many as 7 mandatory rates and a many as 14 total rates. We could remove the 8 limitation, but there may be some legacy issues. We could add an extension that for "Supported Rate Extension" that would add an element to the table, etc.

Marty: Wouldn't it be good enough to say that the first eight must the legacy elements.

Chris: I propose that we just remove the limitation and see if someone complains.

Sean: There are seven mandatory rates, so we only have one slot to ... This seems like there will be some problems.

Carl: I agree with Chris.

We will adopt dropping the "1 to 8" and replacing with "multiple".

Kevin: Do we need to worry about the order?

Terry: There is no limitation

This was agreed to by unanimous consent.

Bill Carney and Terry Cole had a discussion regarding mandatory rates. It is clear that this text is confusing.

Marty:

Chair: What you want, Marty, is a clarification in the Draft about the word *mandatory*. Why don't you get together with the editor to clarify that. Marty, you and Carl can get together and make an editorial change.

Comments 12-17: Legacy indication element in IBSS -- paper presentation by Jeyhan.

Jeyhan is presenting 02/235r2.

There is some language about 30 second interval. Marty thinks that we should be able to set this value with a default. Jeyhan thinks that this needs to be the same, so we should pick a value between 6 and 30 seconds.

The special committee thinks that we need to make some change, but we didn't have a position for this paper. The paper only has a position for and IBSS. We need to have some words for an AP and and IBSS.

Other questions?

Marty: The stations are going to scan and possibly clobber the data.

Jeyhan: We are only considering the IBSS case.

Editor: You are also including a time-out

We need to use the same information elements in the IBSS and BSS.

We are modifying the document to replace "up to 30 seconds" to "

Motion: Move to direct the editor to incorporate the modifications to Legacy Information Element in Document 02/235r3

Moved: Jeyhan Karaoguz
Seconded: Dick Allen
Vote: 12/6/9 The motion fails.

How do we progress from this.

Editor: Should we make a motion to have the editor add a paragraph for the IBSS case?

The text says that this is in a beacon frame. It is from an AP....

Chair: We are going to leave these unresolved and move on. Terry can get together with the interested parties

Comment 18: The proposed solution was to reject the comment with no change. We were concerned that by reordering we may be breaking things. Marty says that was a reasonable response. Marty made a plea, but was willing to accept the resolution of the special committee.

The comment was rejected and resolved by unanimous consent.

Comment 19-21: PBCC and ERP-PBCC.... Editor says that the text is already in to have it, but it may be redundant. Someone said that we should leave it for consistency. The meaning is if we implement on set of PBCC we should implement both ERP-PBCC and PBCC.

We need to decide what we want and have it documented.

The question is whether or how we control B8 or the extended rate PBCC element.

The recommendation was two mib elements matched to the two bits.

The conclusion was to leave the extended rate PBCC bits and have two MIB elements to set the bits.

This was adopted by unanimous consent.

Comment 22: The editor fixed this in the draft and it was adopted by unanimous consent.

Comment 23-36: Short preamble... See clause 19 row 28 in the basic resolution. Group agreed to adopt this with the MIB element. Jan Boer agreed that the editor has cleaned this up and is satisfied.

The textual change was shown in 7.3.1.4 and adopted by unanimous consent.

The group adopted this resolution by unanimous consent.

In paragraph 7.3.2.9, we agree to replace AP with sender by unanimous consent. This takes care of Comments 12-17.

Comment 37-38: Seems to be something that TGe and TGg need to resolve. There are some overloaded bit problems.

Bits, Information Elements, and order in management frames.

Terry proposes to change to bits 9 and 10 for TGg. This was presented in 02/300R0. There were no real comments. TGh and TGi use what they were planning. Then TGg and TGe have to change to the other bits.

There is no objection to moving to bits 9 and 10. (as shown in 02/300r0 slide 5) Changed by unanimous consent.

Richard Williams: The extended rate PBCC bit may not be totally necessary....

There was not enough support to pull the ERP-PBCC bit.

Comments 39-50: Denial codes. We didn't feel that adding denial codes is necessary or desirable. We recommend deleting all the extra denial codes.

Resolution was adopted by unanimous consent.

We need to make sure we let the commentors know that the AP can still deny service based on the mandatory rate sets. We can be denied if we don't support all of the basic rates of the rate set.

We are trying to decide if we should never be denied if we don't have

Frank: An .11g device should always be able to connect to an .11g network. If the 11g device cannot connect it will be bad for the industry.

Dick: The network manager needs to have control over who and what gets on.

Comment: If you have and .11b device you can be denied if you don't have a WEP key.

Richard W: This is unique in that we have rates that are purely optional.

Sean C: Is there any limits we want to put on.

Jan Boer: I think that it is important that all .11g STAs can associates. This is especially important in the beginning. Later we could exclude

Steve Halford: We should mimic the .11a standard in regard to this

We worked on adding some text to the comment resolution to help clarify the position. The group unanimously agreed to that resolution.

Comment 51: Added more reserved bits for word boundaries. Done by unanimous consent.

Comment 52-58 (but not 55): Concern with RTS/CTS with fragments. The special committee agreed the problem exists and we should adopt 02/150 (which was done in the last meeting). There was not a need to specify an additional protection mechanism. The group agreed that RTS/CTS would not be used to protect a series of frame exchanges.

This was adopted by unanimous consent.

Comment 55: The text is confusing.

The text (in 7.3.2.9) was changed by unanimous consent.

Comment 59-77: See General Comment 5. This should resolve all of these comments. We read through the minutes from the St Louis meeting to get the wording and the resolution completed. We declared these comments resolved by unanimous consent.

Comment 78-80: The Text of 9.6 was modified (editorial) and accepted as the resolution by unanimous consent.

Comment 82: Same as General Comment 11. Closed by unanimous consent.

Comment 86: Use of short preamble...

Recess for dinner...

Document 02/209r7 has all the changes through revision r7 or 02/209. (2002-05-14 7:00 PM)

Comment 81: Todor Cooklev's comment. This is a two part question. The first part is not correct because the receive shall be able to receive both types of frames at any time. This is a non-issue. The second part we believe that we are covered through existing mechanisms. No changes were required. This was adopted by unanimous consent.

Comment 86: Marty thinks that the draft might be okay, but it needs more scrutiny. He withdraws his comment. He believes that the virtual carrier sense mechanism needs to be investigated.

Comment 87-94: Need Annex A. Done under General Comments. Annex A PICS was added. This is considered done by unanimous consent

Comment 95-96: SDL... put on hold due to unknown status of SDL....

Comments 97-106: Missing MIB updates. Group added the MIBs in the last meeting.

Comment 107: Commentor believes that the draft has been clarified with other editorial changes. The commentor agrees that this satisfies his comment.

Comments 95-96: SDL resolution. The special committee said that the Task Group has latitude on how and where to put SDL. There will not be a full SDL model. We need to review this and bring it up in the joint session.

Comment 108: This was changed to editorial and the editor has incorporated it. This was done by unanimous consent.

Comment 109: Changed to editorial. Editor directed to make the change. Done by unanimous consent.

Comment 110: Changed to editorial. There was some discussion on the validity of the comment. Richard Williams didn't believe this was an issue. In spite of the disagreement, the Editor made that change. The resolution was adopted by unanimous consent.

Comment 111: The comment was changed to editorial. The editor was directed to add some text. He did so and the resolution was accepted by unanimous consent.

Comment 112: This was changed to editorial. The editor made the appropriate changes. The commentor was satisfied. The was adopted by unanimous consent.

Comment 113: Editorial comment. There was an unintentional typographical error. The editor made the correction. The group adopted this resolution by unanimous consent.

Comment 114-115: No change was suggested. This was adopted by unanimous consent.

Comment 116: No change was suggested. This was adopted by unanimous consent.

Comment 117: There is some concern that we are causing some problems with how we are forcing the modulation type of the control responses. If we have a PBCC-22 frame, we shall reply with OFDM-12. We may want to ACK with PBCC, but the text seems to preclude that problem.

Richard Williams: The ACK needs to be deterministic so that the virtual carrier sense mechanism can work properly.

Mark Webster: NAV information is often spread through these control frames. The basic rate set should be used so everyone can decode the path.

Srikanth: Let's get someone that can explain the MAC requirements.

Let's postpone until tomorrow (when we wake up). (Half of the group is asleep at the late hour of 2100.)

Question about presentations for tomorrow's Joint TGg/TGe meetings.

There were four papers to be presented.

The meeting was recessed for the night.

2002-05-15 8:13 AM

Joint Meeting between TGg and TGe

The meeting was called to order by John Fakaselis.

There were four papers to be presented for joint review, but we don't have a precise plan for running the meeting. We have made the decision to be able to take motions during this meeting.

Matthew Shoemake: We have about 1:45 together. We have four papers that will be presented. I will do another call later. Terry Cole took a set of comments that are related to MAC issues that we want to present.

No further documents were identified.

The documents were in no particular order, but no one volunteered to go first, so the order listed was the order we were going to present.

The first paper to be presented is Terry Cole's "Slides to Assist with Joint Meeting of TgE and TgG."

Presenting Document 11-02-300r0

"Boring" stuff:

1. Capability Bit Overloading

Bits b8 and b9 are overloaded in the current draft. The good news is that we still have enough bits to solve the problem. The idea is to try to solve the problem here in the joint TGg and TGe meeting. Terry's proposal: TGg use b9, b10 and TGe use b12, b13, b14, and b15. That way we can solve the problem without involving the other groups.

2. Information Element Overloading

3. Management Frame Orders

The chairs recommend that the editors should get together and come back with a joint recommendation. They may also need to get together with the other groups.

There was no discussion, so Carl and Srinu were directed to get together and come back to the groups with the editors' recommendation by tomorrow 2002-05-16. This was done with no other discussion. The scope includes: capability bits, information element, and management frame orders.

TGe Chair is making a statement regarding SDL. TGe has decided to not follow the precedent regarding SDL and is not planning to supply the SDL. They don't see a way of coordinating the SDL. Therefore, they are NOT making a requirement of SDL. The individual pieces will do SDL as they feel appropriate. They will continue upon this approach until they hear otherwise.

TGg Chair: TGg is heading in a similar direction regarding SDL.

Marty: I believe this is the right direction, but I am concerned that the state diagrams in 802.11 as a whole follow some sort of methodology.

Terry: I have a practical question. Annex C is a portion of the standard. Once the standard is all combined, how can we drop this?

Answer: The documents say that Annex C text should be removed

TGg Chair: Marty, your question is another question of coordination.

Jim Z.: How do these questions get answered?

TGg Chair: When we talk about motions they will go to the joint plenary.

Jim Zyren: Instead of draft modifications, we are talking with these overloaded functions.

TGg Chair: We are just ...

TGe Chair: TGg has any right to ask the MAC groups to make any appropriate changes. If there a conflict with the PAR, we need to change the PAR. We want to leave it up to the editors to solve these overloading problems.

Terry: That was the end of trying to resolve MAC comments. From this point forward, these are my comments. I want to make sure that the TGg PHY can work with the existing MAC as well as future MACs. What should happen to a .11b network once .11g devices are added? We believe the .11b devices perform about the same, but the .11g devices work better and more efficiently. In trying to design this we recommended some MAC changes.

Next presentation 11-02-181r1 by S. Choi.

S. Choi: RTS/CTS comments. There are some issues with RTS/CTS. We should try to minimize the usage of RTS/CTS in .11g networks. We should use the CFP to create a .11g CP that .11b devices will think is the CFP. This essentially makes a period the protects .11g devices from .11b devices. This allows .11g devices to avoid usint RTS/CTS.

Motion: Move to adopt the .11g CP mechanism specified in document 11-02-181r1 into the IEEE 802.11g draft by making the change specified on slide 22.

Moved: S. Choi

Seconded: Albert Young

Choi: This will allow us to have higher performance with .11g networks. Strongly support.

Menzo: Did you compare the efficiency in throughput with .11e MAC?

Choi: If you combine the .11g PHY with the .11e MAC, most of the problems go away. This is a temporary solution. This is a complimentary mechanism.

Adrian: What we have here is a scheduling mechanism. I have a concern because we don't have adequate signalling to control the size of the .11 CP. Speaks against.

Choi: I agree partially, but I would try to minimize the size of the .11 CP so only a few .11g CP can be done.

Terry Cole: I speak against the motion. I don't believe this is flawed, but I would like to contest the this causes no harm to .11b stations. This seems like it will reduce throughput to the .11b network. This limits the CP to an OFDM CP and a common .11b/g CP. I have simulated this in 11-02-301. I have examined other mechanisms and have decided that we should do nothing. The RTS/CTS is robust enough.

Choi: Gave a rebuttal to Cole's position.

Marty: Why do we need to use the legacy bit with the system at all? The AP should understand.

Choi: I am not really touching the legacy bits at all.

Menzo: Concerned about time-sensitive transmissions. I believe that the two periods will cause inefficiencies. I am going to vote against it.

Choi: If you use .11e in the future, this will not be necessary. If you are concerned with it, you can try to minimize the usage of this.

Lior: My understanding is that this proposal is based on CF awareness of legacy devices, but there are many devices that are not CF aware.

Choi: True, there are several devices that are not CF aware, but the AP can manage this.

Chris: I am confused about the timing of this. TGg and TGe are well along. What is the need of having an interim solution.

Sean Coffey: I am not clear on a couple of things. Where does the ER-PBCC fit in? Is it only in the .11g CP?

Choi: In .11g only pure OFDM has the problem. We don't need RTS/CTS with ER-PBCC.

Debate was limited by unanimous consent.

Vote (technical): 10/37/32 vote fails

Document 11-02-325 by Chris Heegard. Dual precoding with FEC packets

Motion (for TGe): Move to incorporate the normative text in section 2 of 11-02-325r0 into the IEEE 802.11e draft.

Moved: Chris Heegard
Seconded : Richard Williams

John Kowalski: Is it possible for a non-FEC capable to interpret the packet.
Chris: No. The first portion is in the clear, but the second through the end are not.

Adrian: Does the use of this extend the frame?

Chris: No. This introduces no length extension. All pre-coding is initialized to zero.

Mark Webster: Would this be used only on the RS packets?

Chris: Yes.

Question: Is this only for .11a?

Chris: This applies for .11a and .11g. It will work for .11b, but it is not necessary.

Jim Zyren: Directed to the chair. What is the policy on patents? Is a question regarding patents on this mechanism in order?

Jim Zyren: Chris are you aware of any patents or applications that may be relevant to this presentation?

Chris Heegard: I know of no patents and TI has submitted to the IEEE a letter regarding intellectual property.

Jim: Can you comment to any patent applications that may apply?

Chris: I have no comment.

This discussion will continue at the TGe session at 1:00 PM.

Steve Halford: We are putting this off until a time that we can't do this as a joint session.

TGg Chair: We could reconvene as a joint TGg/TGe session at 1:00 PM.

Question: There was a special order for TGe at 1:00 PM.

Is there any objection to continuing this at

Motion: Move to resume the joint TGg/TGe at 1:00 PM.

Moved: Richard Williams

Seconded: Sean Coffey

Question called.

Chris Heegard/Sean Coffey

Vote: 40/5/16 The question is called

Vote for original motion (procedural): 40/22/13 motion passes

The meeting is recessed until 1:00 PM.

Called the meeting to order at 1:10 PM.

The chair is asking to limit the discussion to 15 minutes. This was done by unanimous consent.

Chris Heegard: I would like to say I learned that there was a problem with the FEC about six months. I have worked on that and have gone through several iterations. At the last meeting, there were some objections because it scrambled the header. We fixed that flaw. I believe that people should support this.

Steve Halford: Point of Order. We haven't had a chance to ask questions.

Mark Webster: This scrambler-descrambler is essentially identical to what is in .11b?

Chris: Yes

Question: Any information on performance benefits such as PER?

Chris: Historically there were some simulations. There were some problems due to this scrambler. If you fix this problem, you get back to the original curves.

TGg Chair: S. Choi didn't you present a paper on this?

Yes: Document 11-02-050r0.

Sean Coffey: Document 11-02-239 was a document that we

Asked for unanimous consent for adopting the motion. There were two objections.

Chris asked a question: Is someone trying to propose a different solution? I believe that this is a solution to this problem.

No one else is presenting a solution.

Lior: We are not voting wheter FEC should be there or not. It is there. We are just trying to fix the flaw. I speak in favour this.

The question is called:

Vote on the motion (technical): 20/12/20 motion fails.

Chris Heegard moves:

Motion: I move that we remove the FEC from the 802.11e draft.

Moved: Chris Heegard

Seconded: Thomas

Motion: Move to table.

Moved: John Kowalski

Seconded: Peter Johansson

Not debatable.

Vote: 26/19/5 (motion passes, the motion is tabled to TGe's table)

There are no further topics for the joint TGg/TGe session.

2002-05-15 1:27 PM

The joint meeting is adjourned.

2002-05-15 1:45 PM

TGg's meeting started again.

Continuing on with comment resolution.

Comments 95-96: SDL. There was a joint agreement in the previous meeting that we should put editing notes that we should delete Annex C. This was agreed to do this by unanimous consent.

Comment 117: Revisited from last night.

Gunnar: Talked about the fragmentation and RTS/CTS.

This implies that all ACKs must go out as

Mark Webster: The fragments are sent with a higher rate, so the data is protected by the ACK. The assumption is that the ACK is heard throughout the network. It is only the ACK that protects from fragmentation.

Terry: Do we know what control responses should be?

Richard Williams: Does everyone agree that this forces ACKs to be in the basic rate set.

Gunnar's suggestion: Don't use fragmentation with ERP frames. If you use ERP frames, ACK with the same rate.

Mark Webster: If you are in a fragmentation mode, you use ACK from the basic rate set. If you are not in a fragmentation mode, ack at and OFDM rate.

Gunnar has a proposed solution, but we don't seem to have unanimous consent.

Richard: Perhaps we should just leave this section the way it was so that we always ACK with something from the basic rate set.

Richard: Request a straw poll.

Case 1: Control response shall be in basic rate set (as in 802.11).

Case 2: Control response to ERP frames shall be in the modulation and rate as received, except if fragmenting. When fragmenting using ERP frames, you shall use the basic rate set for control response frames (as in 802.11).

Vote:

Case 1: 7

Case 2: 7

There was a lot of discussion about this poll.

Richard: I chose 1 because it seemed simpler and more direct, but 2 seemed to cause us problems.

Dick: I liked 2 because it gives us maximum efficiency. The ACK is to tell the person who sent the frame you got it.

Mark: I voted for 2 because if you want to ACK in OFDM.

Richard: I sympathize with the view. I was leaning to 2, but we have a bunch of issues. I get the feeling that the ACK philosophy is being changed.

XXXX: We are making that the channel is symmetric with #2. That is not necessarily true because the power may be different.

Carl: Our original text said that the ACK would come at the highest mandatory rate less than or equal to the rate.

Dick: It seems more likely that the small ACK will get through better than the data frame.

These issues exist today with current devices.

Terry: Perhaps we should add a third solution. That limits the ACK to the highest mandatory rate less than or equal to the received rate.

Straw poll: Which should we continue to word-smith to try come to consensus.

1: 3

2: 0

3: 11

It looks like we want to work on the third one.

Carl Andren has some ideas: He worked with the text.

Reminder of the social event.

Recessed at 3:04 PM 2002-05-15

2002-05-16 8:12 AM

Meeting called back to order.

The latest version of the draft is on the server so that the whole group can look at it.

We have until about 5:00 PM until we have to complete the review to go to letter ballot.

We have several tabs that need to be completed.

The order doesn't matter much, we just have to have all the issues resolved.

Are there any submissions other than Anuj (4-Channel Special Committee Report) and Steve Halford (11-02-347)? There may have been one from James Barker...

One issue. Kevin Smart has offered to be the official and permanent secretary. The chair would like to have a motion or unanimous consent.

Motion: Move that Kevin Smart be made the official and permanent secretary of TGg.

Moved: Carl Andren
Seconded: Sean Coffey

The motion is adopted by unanimous consent. Kevin Smart is the new secretary

The wine last night had a "g" as in "TGg" on the label...

We spent about two hours to try to resolve the rateACKs are done at. We split into a special committee to try to resolve that issue. We are doing this by unanimous consent.

Back to "Non-clause 19 and Appendicies" comments... (Working from 11-02-209r9)

Comment 118: We are adopting the proposal by the special committee by unanimous consent.

Comment 119: We believe the commentor was correct. This was handled with text regarding control responses and we have added a statement about fragments. We see no further change necessary. This was adopted by unanimous consent.

Comment 120: We handled this through the resolution of 117. This was done by unanimous consent.

Comment 121, 123: Are the same as 118. Already done by unanimous consent.

Comment 122: The task group adopted the special committee's recommendation by unanimous consent. The commentor also agreed.

Comment 124-141: The people don't believe that PAR allows for MAC changes. It is clear that minimal changes or additions are required to make g devices work. The TG chair didn't oppose these minor changes. There is no prohibition in our PAR and there is a precedent to these types of changes (802.11a and 802.11b) and pieces of the MAC are deliberately extensible for new PHYs. The resolution was adopted by unanimous consent.

Comment 142: TGg included the inclusion of MIBs and PICs. Already resolved.

Comment 143: This is an edge case.

Jim Z: Is suggesting that we put this aside and bring some MAC guys in to help us resolve this. Steve had identified a document from Menzo that could solve this.

Richard Williams: The commentor is asking for a statement in the document that states that this is not a perfect solution to the problem. We don't have to overhaul the document to resolve this.

Jim: Before we vote, would it be possible to table this for a while?

The chair is asking for unanimous consent to put this on hold. There was not objection, so we moved on by unanimous consent.

Richard: The other solution is to pull out Annex E.

Terry: There would be many other problems if we pulled it out.

Dick: There was a second part to the comment that we may have commented.

Terry: We have solved the second part.

Comment 144: Section 7.3.1.4 has been updated, so this should be resolved. Done by unanimous consent.

Comment 145: This is being handled through editor coordination. This not part of a no vote. The resolution is adopted by unanimous consent.

Comment 146: Perhaps we need to coordinate with TGe. The TGe document should take precedence to the aCWmin value. The editor is instructed to coordinate with the editor of TGe. Perhaps we should have a default aCWmin that can be overridden based on the use of other MAC. If we add the word *default*, then we get this functionality that seems to solve our problem. This was adopted by unanimous consent.

Comment 147: aCWmin issue. We debated it, but we don't believe it is an *unfair* advantage. We improve network efficiency while maintaining reasonable fairness. This was the original intent and we still believe this is correct. This was adopted by unanimous consent.

Comment 148: An exact copy of 146.

Comment 149: Same as 147. Agreed to by unanimous consent.

Comment 150: We solved this earlier on Comment 10-11 of this section. Resolved by unanimous consent. The commentor also agreed.

Comment 151: The original language was AP centric, but we have changed the text to allow for IBSSs. Section 9.6 covers this comment. We are not aware where this is a problem. We have added clarifying text.

Carl: We have added Annex E to handle some of these situations.

Jeyhan: I believe that we can use the same resolution to the commentors of 12-18.

Editor: We also want to do it in Appendix E.

We resolved this by unanimous consent.

We completed this tab.

We are staying there to solve 143 and 117.

Carl will work on 117.

Comment 143: Choices: Remove Annex E or Note in Annex E that it is not a perfect.

Menzo: This is fine by me, but I can bring a little light to the problem. He gave a situation where this can happen.

This merely identifies the problem, but does not solve it, but the commentor was not asking for a solution.

2002-05-16 10:03 AM

We recessed for the break.

2002-05-16 10:34 AM

Carl showed the modified text.
We made some minor modifications.
We resolved this issue by unanimous consent.

We have a one more comment to resolve.

Tab "Clause 19.5 and 19.6" is our next order of business. Sean Coffey will lead that discussion.

We are starting discussion with 11-02-209r9, with 11-02-209r10 to be issued upon completion of the resolution of this tab.

Comment 2: Basically requesting removal of PBCC option. The group adopted the proposed resolution by unanimous consent.

Comment 3: The comment was primarily concerning the switch from PBCC-22 to PBCC-33. Many errors have been corrected and details have been given. This was accepted by the commentor. The group adopted the proposed resolution.

Comment 4: Worked on the status. Resolved by General tab Comment 11. Done by unanimous consent.

Comment 5 is the same as 3: Resolved by unanimous consent.

Comment 6: Resolved by General tab Comment 11 by unanimous consent.

Comments 7, 8: Text as shown in 19.4.3.8.5 will be included in 19.5 and 19.6. This was done by unanimous consent.

Comment 9: Exact copy of 6.

Comment 10, 12, 15, 17, 19, 22: The numbers will be supplied for further review.

Comment 11, 13, 16, 18: The numbers will be supplied for further review.

Comment 14: Copy of 6. We agreed by unanimous consent.

Comment 20, 21: Dangling references. The editor has made many correction. Done by unanimous consent.

Comment 22: The commentor is talking about options and believes that multiple PHYs being defined. We believe that options do not make separate PHYs. This resolution was adopted by unanimous consent.

This afternoon's meeting is not exclusively for the joint session.

2002-05-16 11:58 PM

Recessed for lunch.

2002-05-16 1:05 PM

Called the Joint TGg/802.18 Meeting to order.

Started out by having a report of the status of the 802.18 TAG.

The purpose of 802.18 is to work with regulatory bodies and to work with the wireless working groups.

He doesn't have much to present.

ET 99-231 There will be a report in order shortly. They will take action on it in the meeting today.

We may not have the text for a period of time.

Jim Zyren: Another issue with the FCC. Amateurs are asking for primary status 2400 2402 Satalite downlink band. RF lighting is also something to keep in touch with.

It looks like the RF lighting will go from the OET to the 8th floor.
The amateur thing was reported during the midweek report. They are looking for comments.

One thing under consideration is to look at doing something like the 900 MHz band (safe harbour). The would be presumed to not be causing harmful interference.

Carl will be working this afternoon to get a draft on the server as soon as possible. He will send a message to the reflectors as soon as possible.

TGg Chair: The only thing that we have related to RF issues is on our Comment 105 on our Clause 19 tab. Carl doesn't know the answer to the question of OFDM in 2.4 in Europe.

Dick: Someone showed him the EC regulations. It shows there are rules for FH and DS (with the definition of DS as anything other than FH).

Jim Z: That is true. He quoted the section. He doesn't think there is a problem in looking at it.

Dick: It would still be worthwhile to research it for Europe and tier 1 countries.

Jim: Primairly we need to worry about FCC, NTP, and ETSI. Nearly everything else is covered by those.

Carl will take and Action Item to look into this issue. He is signed up. He will report on this issue in Vancouver. There is unanimous consent for this request.

In Vancouver, we will have a joint TGg/802.18 meeting. We will have a report on these regulatory agencies.

Joint meeting ends at 1:22 PM.

TGg meeting resumes at 1:22 PM.

There are two presentations that the chair would like to get to. One from Steve and Anuj. The chair is doing one last call for papers. One more paper from Mark Webster 11-02-367 (Adjacent cell interference). Steve Halford 11-02-365.

Adjacent Channel.... Mark Webster.

First paper by Mark Webster "Adjacent Cell Interference: Comapring 802.11a & 802.11b Specs" 11-02-367r0.

Mark is having some concerns between the adjacent cells. He didn't do any analysis. He just compared the cells.

Perhaps we should have a tighter mask...

Richard W: So this 16 dB hotter? How do get these numbers (slide 5)? Answer: you get them from the standard.

These were just qualitative results based off the sensitivity levels. He is just presenting data that is in the spec. He wants to work with Anuj to get more educated.

This was just an informative presentation.

Steve Halford is presenting 11-02-347r1

Dick: Thanks for the analysis.

Steve: This isn't really a new change for .11a devices. It is just more back-off. Is the 6dB more interference really much of a problem? We have run some tests where adjacent channels have causes problems. One advantage of g over a is the range advantage. We will still have the range advantage of 24-54 Mbps.

Chris: Do you know of any patents or applications that apply to this.

Steve: No. I know of no patents or applications regarding this.

Richard: This is addressing the comments regarding the adjacent channel interference?

Steve: Yes.

Richard: So, we just keep the same adjacent channel rejection test?

Steve: This primarily protects legacy systems. Do we now need to rewrite the ACR tests? People seem to be reluctant to add more receiver test. The receiver performance is a function of design. This proposal solves the issue of legacy systems.

Motion: Move to adopt proposed spectral mask on slide 17 of Document 11-02-347r1 for ERP/OFDM and CCK-OFDM modulations.

Moved: Steve Halford

Seconded: Mark Webster

Discussion:

Motion: Move to table.

Moved: Sean Coffey

Explanation: Sean Coffey: This is a lot to absorb in a short period of time. I am not comfortable with it for the moment.

Second: Dave Richkas

Point of Order: What are requirements (procedural, technical).

Answer: Procedural (simple majority)

Objection to doing it by unanimous consent.

Vote on motion to table: 18/11/5 (the motion is put on the table)

Recess from 2:50 until 3:20 PM.

It looks like we won't have time to get to letter ballot this week.

We had a request to not have any evening meetings in Hawaii (November Plenary)

Report on Special Committee Findings of 4 channel scheme. Document 11-02-368r0 was presented by Anuj Batra.

Basically the proposal was to define Channel 0.

European Channel Selection Scheme: Also possible.

In Korea, Four non-overlapping channels is currently being used.

These channels are already defined, it is just a possibility.

The group consensus was that it was generally a good idea, with five main concerns.

Questions: Is this for both for OFDM and CCK?

Answer: Yes.

Question: You showed it for CCK. Does it also apply for OFDM?

Steve Halford: I will address that to some extent in my presentation.

Questions: Is this for .11g devices? What about .11b?

Answer: This is for .11g. We are not sure about the impact on existing .11b devices.

Jim Z: Do you have any comments on how this might impact PBCC-22 or -33?

Answer: I don't this will have much impact.

Mark Webster: You mentioned that this would only be for 802.11g devices only. Our document says that in pure 802.11g mode, we will be limited to OFDM. Does that mean this is applicable for OFDM.

Answer: The four channel scheme doesn't require any particular modulation scheme.

Matthew Shoemake: Legacy devices don't know about channels 0 and 12, but they could join channels 4 and 8.

Anuj: What we do when a

Jan: You can only use Channel 0 in a pure .11g network?

Anuj: Yes, but there could be a firmware change to allow for this option.

Matthew: There may be an maintenance PAR for .11b where this could be an allowed option for .11b devices. It is also up to the network administrator

Jan: We are supposed to be backward compatible with .11b, this seems to break that (especially for channel 0). This seems to have some interoperability issues.

Sean: This requirement is for the mandatory modes. The options don't have to be backwards compatible.

Chair: If you put OFDM in your basic rate set, legacy devices won't be able to join.

Steve: This is being proposed as an option. That would mean that .11g devices would have the same problems as Jan pointed out for legacy devices. It seems dangerous to do this without making it mandatory.

Anuj: All I am proposing to do is to define channel 0 and allow channel 12 for North America.

Jim Z:

Anuj: I am looking at this in two steps: 1) define channel 0 and 2) allow use of channel 0 and 12 in North America.

Jim Z: What is the impact of 20 MHz channel spacing for other or optional modulation types.

Jim Z: Do you know of any patents or applications that apply to this proposal?

Anuj: I don't have to answer that, do I?

Chair: No, you don't need to answer.

Steve Halford: Do you have a feel for the back off in your tests?

Anuj: We used Cisco and Orinoco. We did experiments because people sometimes believe that more.

Presentation of Document 11-02-365r0 was presented by Steve Halford.

There were a couple of minor errors that will be corrected in 11-02-365r1.

Questions:

It is great to get extra channels, but it seems late in the game to be adding this.
In order to do this: How close is close?

What does adjacent channel interference mean in terms of performance?

What does it mean to have an extra 6dB of interference?

No answer.

If you use the proposed mask (from the previous presentation), the additional backoff is less, but the absolute number should be about the same.

Richard: How does the 12.xx dB interference number compare to Mark Webster's 16 dB number.

Steve: The simulation is more strict than the required transmit mask. This gain is bounded by the 16 dB number.

The back off numbers may change as better PA designs come to market.

Steve yielded to Anuj.

Motion: Move to add definition of CHNL_ID=0 to correspond to center frequency of 2407 MHz in the IEEE 802.11g draft.

This is not to be considered mandatory in the PICS.

Moved: Anuj Batra

Seconded: Richard Williams

Discussion:

Dick Allen: I am concerned that we may be shooting ourself in the foot. This opens the door for more comments and seems dangerous. I believe this is a good idea.

This motion says that channel 0 exists. It does not mandate any functionality.

Dave: Argue in favour. It is a simple firmware upgrade. It is just adding a definition.

Jan: I agree with Dick that this is dangerous. There may be problems with backwards compatibility. I agree

Steve: I agree with Dick and Jan and Dave. The inclusion of this opens us to more comments in the future. Perhaps this is better handled in the future. I don't see the necessity of this at this time.

Dick: I agree with Steve. I believe this motion is pre-mature. We should table this.

Richard: I disagree. People outside of the US use four channels and get benefit from that. Adding channel 0 allows people in the US to do what everyone else in the world is allowed to do.

Jim Z: I don't believe that this is as innocuous as it may seem. There are areas in the world where you can use more channels because they have more bandwidth. Speaks strongly against.

John Terry: I believe the motion is innocuous. I believe that the concerns about opening the can of worms gets worse as time goes on. I think the motion is fine. Speak in favour.

Mark Webster: I speak strongly against. There were regulatory reasons that the table was added the way it is. We need to consider those reasons. We need to fully understand before proceeding.

Willem Mulder: Strongly against. Cell size, backoff, and forbidden bands. Wants more analysis.

Steve: Simply defining the channel does nothing and there is nothing to prevent you from doing this today. As such, this is just a small step. Strongly against. This just opens us to more comments. Calls the question.

Anuj is willing to withdraw the motion to allow andfor more conference calls. There is a request for members to participate in the conference calls.

The motion was withdrawn and Anuj was enabled to have conference calls by unanimous consent.

Our agenda has time for new business. There was no new business. We are returning to comment resolution.

Carl: There is only one straw poll that hasn't been resolved (9 us slot times).

Straw poll: 9us slot times in OFDM only network?

Yes:

No:

Terry: Was this raised in an letter ballot comment?

Yes, Richard Van Nee (clause 19 comment 121).

Discussion:

Mark Webster: I am not sure I understand the question

Carl: If you have an OFDM only network you will have a 9 us slot time or a 20 us slot time.

Sean: The suggest comment says "extended rates".

Steve: Let's wait until we can hear from Richard in Vancouver.

Terry: Would like to get a draft.

Motion: Move to direct editor to produce an updated draft of IEEE 802.11g immediately following the May 2002 session with revision marks from Draft 2.1. The editor may insert editors notes to draw attention to items that may change. The draft shall only reflect the motions and resolutions that have been adopted.

Richard Williams: Are there any edits that we haven't agreed upon? No with the exception of editorial comments.

Bill: Have we formally adopted all of the changes? Yes. We have not adopted all of the comments, but we have a snapshot look of where we are in preparation for the Vancouver meeting.

Moved: Terry Cole

Seconded: Kevin Smart

Vote: 27/0/3 (motion passes)

Continuing on with Sean Coffey leading the session.

Clauses 19.5 and 19.6.

Comment 24: Editorial comment. Adopted by unanimous consent.

Comment 25: Addressed with Comment 24. Adopted by unanimous consent.

Move to adjourn.

Moved: Chris Heegard

Second: Steve Halford

Done by unanimous consent.

2002-05-16 5:28PM

**IEEE P802.11
Wireless LANs**

TGh minutes, May Interim meeting, Sydney, AU

May 16, 2002

Evan Green
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Meeting called to order Monday May 13, 2002 10:30am

Opening discussion: Can TGh complete its work prior to ITU-R resolving RADAR detection?

Should we include a placeholder reference in the TGh standard to ITU-R JTG 4-7-8-9? Andy Gowan suggests that TGh should create simulations to show that this new standard will be able to detect the radar systems identified so far by ITU. Will the radar community accept this without physical tests?

Mika explained that it is up to the 802.18 group to communicate with ITU-R. Carl Stevenson and David Skelrn suggests that TGh members who are concerned about radar detection engage in ETSI BRAN who is working closely with ITU-R.

David Skelrn reported that the BRAN group has made progress with ITU-R. Agreement is that DFS is needed and ... Ericsson has proposed an algorithm, though may not be the best approach, is generally agreed should be able to detect radars. He did note a concern that new RADAR systems may continue to be identified, such as the most recent two, that could keep delaying the process.

Upshot: TGh may need to prod the .11 membership into not keep rehashing that TGh is to write a standard vs BRAN's work to negotiate with ITU-R.

Andy Gowan suggested that if IEEE members could execute tests on prototype DFS enabled systems it could raise confidence in DFS in the ITU-R. He indicated that regulatory labs are available that can simulate RADAR signals to facilitate these tests and that confidentiality could be maintained.

Discussion regarding revising PAR to drop the "in Europe" from the title.

Peter Ecclsine reminded the group that this language was included to expedite the completion of TGh Carl Stevensen reported that the US RADAR community, in ITU-R meetings, is pointing to this language as an indicator that vendors are unwilling to implement DFS in the USA.

Strong plea for participation from IEEE members to participate in ITU-R and also engage with the FCC. It is perceived in ITU-R that there is little interest from US companies. Its not too late for US companies to influence US position on WRC agenda 1.5 on 5GHz global allocation. (Carl Stevensen could clarify).

Plans for this meeting are to resolve comments from the letter ballot with an objective to go in to a recirculation ballot in July meeting. In the mean time try to change no votes into yes votes through the comment resolution process. Process for comment resolution is to go through the comments line by line in the spreadsheet.

Call for submissions:

Peter Larsson: Method for detecting RADARs

Motion by Peter Ecclsine to approve agenda as modified in document 306r1. Seconded by Peter Larsson. No discussion.

Yes: 14
No: 0
Abs: 0

Motion by Stuart Kerry to approve minutes of St. Louis meeting seconded by Chris Hanson. No discussion

Yes: 15
No: 0
Abs: 0

Comment resolution:

Comment spreadsheet is in document 302r1. Intended process is to proceed line by line and record resolution in the spreadsheet document.

Straw Poll:

Option 1: Leave the words “in Europe” in the title of the TGh draft standard and associated PAR?

Option 2: Should we change the title of TGh draft standard and PAR title to delete “in Europe” without changing the scope of the PAR?

Option 3: Should we revise the title and scope of TGh draft standard and PAR to address a global solution rather than focused on Europe?

Option 1: 14
Option 2: 2
Option 3: 3

Straw poll: Should we remove the TPC request/report from the draft?

Yes: 1
No: 16

Motion by Colin Lanzl to limit discussion to 15 minutes for each comment. Seconded by Charles Wright. No discussion.

Yes: 17
No: 0
Abs: 0

Straw poll: Should we keep IBSS DFS information in beacon frame mandatory (7.3.2.1)?

Yes: 6
No: 2

Straw Poll: Should we [a] eliminate the power capability element (7.3.2.9) or [b] add a dynamic range (minimum power capability) or [c] leave it as it is?

Option a: 2
Option b: 13
Option c: 1

Tolerances: A small group of experts will meet this evening to propose a set of tolerances for transmit power. The results will be reviewed by the group and incorporated into the draft.

Straw poll: A STA in an IBSS when receiving channel sw announcement with mode bit zero set to one:

[a] shall act on it

[b] shall not act on it

[c] may optionally act on it

a: 5

b: 0

c: 16

Straw poll: Should we redo the measurement request element as suggested by Jin-Meng Ho comment on 7.3.2.14?

Yes: 0

No: 9

Abs: 7

Straw poll: Should we eliminate the OSR defined in section 7.3.2.15.4 including removing all references to it?

Yes: 11

No: 7

Abs: 5

Presentation by Peter Larsson document 02/344r0

Straw Poll: Should we include the randomisation of quiet periods:

[a] as proposed by the “main solution” in doc 02/344r0 or

[b] using the mechanism provided by the existing quiet element (add how-to) or

[c] no randomisation (no changes to existing draft)?

Option a: 5

Option b: 3

Option c: 11

Abs: 5

Motion by Chris Hansen to remove OSR from the TGh draft D2.0.

Discussion: Seven comments noted asking to remove this feature.

Seconded: Colin Lanzl

Yes: 8

No: 2

Abs: 1

Motion by Amjad to add fifteen minutes discussion time for comment 332.

Seconded by Charles Wright

Yes: 12

No: 2

Abs: 0

Straw poll: In an IBSS, should we allow any STA to make measurement requests to any other STA?

Yes: 17

No: 1

Abs: 1

Straw poll: Should we add a timestamp to autonomous measurement reports?

Yes: 7

No: 3

Abs: 11

Straw Poll in the working group. [from penary session]

Option 1 – leave the words “in Europe” in the title of the TGh draft standard and associated PAR. 84 in favor

Option 2 – change the TGh draft and PAR title to delete “in Europe” without changing the scope of the PAR: 9 in favor

Option 3 – revise the title and scope of TGh draft standard and PAR to address a global situation rather than focused on Europe. 26 in favor

option 1: 84

option 2: 9

option 3: 26

Official letter ballot results reported to the group by Mika:

Yes: 140

No: 77

Abs: 53

Motion by Andrew Myles: To keep the title and scope of the TGh PAR unchanged.

Seconded by Peter Ecclsine

Discussion: None

Yes: 12

No: 0

Abs: 1

Presentations by Chris Hansen

- 02/353r1 Minutes of TGh ad hoc on TX power tolerances
- 02/354 Proposed draft text for link margin and RSSRI

Presentation by Charles Wright 369r1 Proposed Resolution for Definition of Unknown Bit

Motion by Peter Ecclsine: TGh to consider out of scope any proposal that would allow an equipment vendor to avoid conformance to the ETSI EN 301893 (harmonized standard).

Seconded: Gil Bar-noy

Discussion:

Yes: 8

No: 1

Abs: 2

Motion (technical) by Gil Bar-noy: Any STA compliant to TGh must be able to detect RADAR primary user as defined by ETSI EN 301893 (harmonized standard for 5GHz RLAN in

EU).

Seconded: Victoria Poncini

Discussion: Noted that this motion could preclude potential solutions where a central facility is used to detect RADAR. Also noted that it is likely that EN 301893 will require every STA to detect RADAR.

Yes:

No:

Abs:

Motion (procedural) by Amjad to table the above motion.

Seconded: Chris Hansen

Discussion: None

Yes: 6

No: 2

Abs: 5

Preparations for the next meeting

Plan Vancouver to finalize the comment resolution

Change 23 no votes to yes and go out recirculation ballot

TGh meeting adjourned May 16 21:30

IEEE P802.11
Wireless LANs

Minutes of TGi for Sydney Meeting May 2002

Date: May 18, 2002

Author: Dorothy Stanley
Agere Systems

1 Call to Order & Agreement on Agenda

Meeting called to order on Monday, May 13, 2002 10:30am by Dave Halasz.

Chair: Is there a volunteer for secretary? Dorothy Stanley and Donald Eastlake.

Chair: The status of our work is that we've just had LB 35. The process is iterative. We need to process comments in comment resolution. Determine how to transform no votes into yes votes.

Chair reviewed proposed agenda:

Proposed Agenda:

Chair's Status

Monday

- Submissions
- -Quick grouping of issues – ad hoc, fast re-auth, editor, AES modes

Tuesday

- Divide up comments into groups (more than 1200 comments)
- Comment resolution

No meetings scheduled on Wednesday.

Thursday

- Continued Comment Resolution
 - Prepare for next meeting

Chair: Are there any comments on the agenda?

Comment: Would like to give a presentation on the "Louie" proposal. Also, we went through this process before, and dividing up into groups didn't result in concrete actions in improving the text of the draft. Need to find ways to get comment resolution into the draft.

Chair: Different people have different opinions on when to go to letter ballot. You'll see this when we go through the comments - one position is – don't go to letter ballot until completely finished. Grey area, have an iterative process, refine from there. Example ad-hoc not completely addressed. Didn't have a complete understanding of the solution. The thing holding us back was that needed an association, then realized that that wasn't true. Now we do have a path going forward. Once you come out with something, solutions become clear. In draft 1, solution for ad-

hoc wasn't clear. Not with draft 2 have a vision for a solution. Use .1X as an example – had 11 drafts. We're on draft 2.

Comment: Will there be more discussion on extended IV?

Chair: Yes, there. This would be the type of presentations we'd see in this session.

Comment: Russ had a document on this. See both 02/ 282, and 02/281.

Chair: Any other comments? Any objection to adopting the agenda?

Comment: Is it your intention of having all the submissions today?

Chair: Yes.

Comments: Presentations may not be ready today.

Chair: Modify the agenda to include presentations on Tuesday.

Chair: Any objection to the modified agenda?

Comment: Are submissions restricted to resolving comments?

Chair: Do you mean that the submission would address something that we want to address anyway?

Comment: Wouldn't address current problem?

Chair: Do this Thursday. Any objection? None.

Comment: We went and tried to implement and have feedback, including problems found, inconsistencies in the draft.

Comment: We should consider this as submissions/presentations.

Chair: Are there any presentations?

Jesse – On Tuesday –02/322 - “Louie”

Tim Moore – Monday –02/ 298

Marty – Extended IV – Monday – 02/318

Onno – Extended – Monday – 02/281

Tim Moore – Pre-Authentication

Tim Wakefield/Dave Smith – 02/319 AES Modes

Stephan - Thursday – Public Access Wireless LAN

Paul – Thursday – Test Vectors

2 Monday: Presentations

2.1 Presentation: Onno Letanche – Document 281

This document (02/281) describes the frame format including the extended 48-bit IV. The associated mixing function is described in Document 02/ 282, by Russ Housley & others.

Use 2 words of the original IV, add 4 bytes. Use an extended IV bit to indicate the presence of the extended IV.

Most significant bytes – left to right.

Independent of QOS byte presence.

Chair: Are there any motions related to this?

Comment: Motions to include this proposal will be included in later presentation motions.

Comment: Are the 48 bits contiguous? No – 2 bytes, then key id bytes, then extended. Then format of AES mode is different.

Response: Current definition of CCM includes the 48-bit extension. OCB mode definition does not.

Comment: Formats need to align for TKIP and AES.

Comment: Would result in a segmented key ID field.

Comment: Could vote to move the WEP bits.

Comment: Dealing with existing hardware.

Comment: Reminds me of 8086 situations.

Comment: If the format that you're proposing gets adopted, then that must be adopted for AES.

Comment: Not necessarily

Chair: Make use of reserved bit. Possible to have different formats, indicated by the reserve bits.

Comment: Index is the same.

Chair: Do you see this as a smooth migration?

Comment: End up with a field in the middle of a count. It can work, but won't be pretty.

Comment: First 2 bytes increment more quickly. Last 4 are more static.

2.2 Presentation - Marty Lefkowitz – 02/318

Implicit Initialization Vectors

Use a reserved bit to toggle every 65K packets.

History of the IV in an 802.11 packet.

1999 WEP properties – It is reasonably strong, self-synchronizing, exportable, optional, efficient.

Some apply, some don't.

Solution to IV Issues:

- Enforce IV change for every packet. Then 3 options:
- Rapid re-keying, extend IV, combination of both.
- Rapid re-keying hard to get right.
- With extended IV – 100 years, still need to deal with group key.

Adding 4 more bytes – split IV

More overhead: .02-6% overhead.

Interoperability with legacy stations

Mixed network with OCB – want the format to be the same.

Advantage of 48 bit IV: More secure, makes re-keying simpler

Use one of the reserved bits as an edge-sensitive toggle when overflow occurs during the counting of the IV. Incrementing the upper count cannot be officially incremented until after the replay window expires from the packet that contained the last count.

Group key, Beacon/response contains the current upper and lower IV count.

48-bit is good – implicit IV doesn't decrease over the air performance

Comment: Where did .5 second MPDU lifetime come from?

Response: In 802.11 spec.

Comment: Need to make the language clear about when the count starts.

Comment: Need to clarify that can't queue packet for more than .5 second.

Comment: Do you think could miss 65K packets?

Response: Assume a 2 priority system, after the 65K one time, have 16K of the low priority packets

In the queue, need to kill them off. The data sources sending packets at the same rate. Timer mechanism prevents this scenario.

Comment: If your scenario is true, then the air interface isn't adequate.

Chair: any objection to recessing until 1pm? No objection.

2.3 Presentation – Tim Moore- Suggested Changes to RSN (02/392) Documented text in 02/298.

Took Draft 2 and tried to implement it. 2 changes to it – 48-bit IV, took out pairwise re-keying from state machine.

General comments on draft 2 –

Draft 2 is difficult to follow, we re-wrote large pieces of the document, added clarifications in response to internal developer questions.

Legacy support – needed to specify what combinations of legacy/RSN support.

Authentication – went back to 802.11 open authentication – reverted back to 802.11 state machine.

Did .1X as an authenticated key management protocol over an 802.11 data link.

-Some issues in 1X state machine

Some issues in EAPOL-key message

Encrypt with key mapping key only; can't start a second association otherwise.

Comment: Did you look at having a new authentication type, completely at the 802.11 level?

Response: Yes, looked at 3 options. Couldn't prototype what you're suggesting. Think about .1X as a key management protocol, not an 802.11 authentication method.

Information element – difficult to work out the valid combinations; need to add a table of combinations and reference code.

Found pre-shared key is a special case for users. Needed to add an authentication type to make this easy to use for users; Helped configure the UI to help the user make it work.

PRF – needed reference code and test vectors.

TKIP – Used 48 bit IV, used explicit frame format

Michael – assumes unicast keys with different integrity in each direction.

Broadcast key – used one key

Countermeasures – trying to stop handing out new keys for the attacker to attack. So, rather than stopping the MAC, stop handing out keys. If attacker is attacking one station, doesn't affect others. Discussed this with Niels.

Document is most of chapter 8. The implementation is still not complete. We have .1X going, but don't have 3 interoperable solutions yet.

How to proceed with Document 02/298? Feed changes one at a time? Take all as a whole? Need feedback.

Chair: Suggest taking that up as an ad-hoc discussion.

Comment: TGi has never had a line by line review of the draft, When we believe it is stable, we will need to do this.

Comment: That's what we did with the developers.

Comment: Operational phase is "With our developers". Could do line by line here, but not the same.

Comment: Point was rather that we as a group don't know what's in our document. Difficult to know what we mean by consensus on it.

Comment: Some of the problem comes from the way IEEE changes documents. Editorial directions make it difficult to understand what's really going on.

Comment: Some of the clarifications may not be appropriate for the standard, but extremely useful for developers.

Comment: Need implementer's notes.

Comment: Way beyond what's usually there.

Comment: Write a "dummies guide" to TGi.

Comment: Can you separate into what has and has not changed?

Comment: Would have to go back and look. Some small changes but technical. Some were to clarify interpretation. There were places where it could be read two different ways. Probably 20% were technical changes. 60% were for clarification.

Chair: Going through line by line is a good idea. Suggest doing it before we go to letter ballot again.

Chair: Go through other presentations now.

2.4 Presentation – Dave Smith – 02/319-AES Modes

Paramount objectives of a solution –Trustworthy and reliable security, open and free deployability

OCB is relatively new and untried; history would indicate that there is some risk.

OCB has no compelling performance

HP supports the CBC-MAC (CCM) approach.

Chair: Will most implementations be in hardware – if want this in software. Assumptions on hardware numbers questioned. Processor and speed of the access point?

Response: HP labs did the study

Chair: Know of specific APs that could do OCB.

Response: Really depends on quality of the APs.

Chair: Impact of software was 3% - may not be true for some APs.

Response: Difference between the two is relatively small.

Chair: For the vast majority of current hardware, this isn't true.

Comment: What's a McKinley?

Response: An intel Pentium, HP RISC processor.

Comment: What do you mean by .11 speeds?

Response: 11 Mbps speeds

Comment: You just mention the authentication algorithm

Response: Mean CTR mode with CBC-MAC (CCM)

Comment: Were you planning to propose something?

Response: Strongly urge group to consider CTR/CBC-MAC, don't rule it out.

Comment: Want it to be mandatory?

Response: It's not ruled out.

Comment: Biggest issue is really with patents? Does anyone else have any new info?

Chair: I have talked to a couple of the patent holders. No matter what we do, you have to worry about IBM. Mentioned that this is a concern.

Comment: Seems to me that you're going to have to throw it out unless they get together.

Chair: With draft 3, go through a line by line. Do we have a solution that can pass as a standard? IP reasons would say no today.

Comment: (Presenter) Had major issues with patents on token rings.

Comment: Has been a majority in favor of CCM.

Comment: A number of system companies are concerned about the patent issues.

Comment: Companies that distribute to customers.

Comment: When will we go to draft 3?

Chair: Would love to see by next meeting. But there is a lot to deal with.

2.5 Presentation: Jesse Walker- 02/322 The Louie Architecture

Needed a “Crypto-king”, in all cases. Doing this work to make sure that everyone understand how these systems have to work to be secure. Not necessarily expecting that all of this will be adopted.

Will apply to IBSS, BSS, hotspot, home, enterprise.

Motivation: Reduce complexity, modular architecture, address gaps on the current architecture, enable proper problem partitioning. People who do security for a living look at our document, and say that there is no way to determine if the proposed solution is secure.

Address gaps in the current architecture. How to bind authorization onto the PSK. How to bind to the right man-in-the-middle designed into 802.1X based networks.

Security is often designed in after the application domain is finished. The security application partitions differently.

Motivation – architectural gap. Authenticating the EAP server doesn't tell the client anything about the AP.

Comment: What goes wrong if you don't have it? How?

Response: When the naming of keys wasn't right, then a few years later someone comes along with a successful attack. Not showing the attack, showing where they will come.

Comment: Credential gave you a key. Tied it to a hash value. Tie the hash value to the credential.

Comment: TLS/RADIUS as been around for years, and hasn't been attacked.

Response: To make this work, need the CIO department in the background, to detect hackers. Want protocols to deploy in many different scenarios. We haven't constrained the problem to where an IT department exists.

Comment: Key distribution more than key transport; binding proper level ids to key is the critical function of key distribution.

Continue to base on 802.1X, evolve it.

Utilize the same key passing procedure for initial contact roaming and IBSS

Utilize proven security procedures

Eliminate AP-AP transactions

Define a complete architecture – advertisements, registration, unicast key distribution, multicast key distribution, revocation.

Every network must have a crypto-king – EAP server, IBSS

Support multiple security domains in one physical location.

Registration with a shared secret

Comment: Use of MAC addresses should be avoided.

Comment: Difference in RFC 2401- keys are identified – destination address/SPI

Response – Should have been just SPI. Danger in using MAC addresses.

Comment: Then need different key-id space. Receiver always passes out the keys; Multi-cast – sender registers keys.

Comment: Need an identifier to use to look up which key to use. Current design uses MAC addresses.

Comment: Confused on how data packet is related to key-id.

Comment: Want to bind the user certified key to the identifier used at the MAC layer. Why do you need the registration?

Response: In unicast key distribution, Louie gets the message from Alice, Louie knows that he's done an authentication previously, so can issue a key.

Comment: Need to know that user/MAC address/key.

Response: Problem is impersonations.

Comment: Are you protecting against someone with valid addresses using their credentials with another MAC address.

Response: Yes.

Comment: Why even do registration with a shared secret?

Response: Need an admission process in to the home network.

Case: Registration with a public/private key pair. For case where certs have been deployed – for example pgp.

Case: Initial Discovery

Broadcast/multi-cast comments

Multicast/broadcast encapsulation is a different animal than unicast; infeasible to prevent forgeries by group members.; it is inappropriate to protect m/b messages that are not idempotent (can be re-sent without harm)

Updating key not sufficient; must also update IV and key id

Revocation only needed when someone leaves the group(has been kicked out); can be accomplished by distributing a new key for the group;should only happen from a central policy decision point.

Case: Distributing Broadcast/Multi-cast keys

Louie makes admission control decision; keys come from Louie, not from AP; Louie must push messages to the AP.

Case: Activating Bcast/Multicast keys

Examples – IBSS, Home/SoHo, Enterprise; enterprise executes EAP method, then eap for key distribution.

Issues: Need buy-in from Tgi participants

Affects - .11i, .1X, AAA, EAP

Revocation, bcast/mcast incompatible with RADIUS, requires adoption of Diameter or COPS for back end.

Next steps: 2 IETF contributions – aaa-key-distribution; EAP enrollment document

Comment: In an IBSS, how do you know who Louie is?

Response: Members pick someone for this role. Louie distributes a set-up key. New member must be able to communicate verbally. Gets a registration key.

Comment: What is the period of Louie advertising?

Response: Haven't discussed this. Is undefined. Do you need these broadcasts all the time, or just while registration is active?

Comment: Now need this in addition to the probe request.

Response: View this as lower frequency than probes.

Comment: Roaming. Associated, need to determine AP/BSS. Look at invitations – security domain. Active scan – probe request, listen for probe response. Need to get the Louie info.

Comment: Send out Louie discovery message. Can this be included in the probe?

Response: De-couple the security domain from the .11.

Comment: Keys need to be bound and used in very specific contexts. Protocol must include info to enable verification that a key is used only in this context. Experience of Louie authors is that it's dangerous to assume that the key won't be mis-used.

Comment: Why should the key ID position matter?

Response: Open yourself to attack.

Comment: Scanning question: Where is Louie? Really, is there a Louie out there that meets my security domain?.

Response: Can scan and roam, with risk that your old credentials won't work. Working on pre-authentication algorithms to solve this.

Comment: In the current scheme, get the ciphersuite back.

Response: This is insufficient.

Comment: One security scheme per BSS no longer valid? Have NetID. Need to determine that as we roam, we are in the same security domain.

Response: When you scan and ask for the info, get all of the info in one message. Will need to be able to put it in the beacon and the probe response – this will be the cost.

Comment: Do you assume that Louie is in the same subnet or physical LAN?

Response: Yes, using LAN broadcasts. APs will proxy these invitations. When cross subnet boundaries, have a problem. Why? No ghost of a chance ratifying something that used higher layer. Most people turn off broadcast in routers.

Comment: Is there a back-up Louie?

Response: Yes, use existing RADIUS duplicate systems. Session resume in TLS requires keeping state. If replicate the server, need to propagate state to the backup.

Comment: Does back-up RADIUS server send out the Louie invitation broadcasts?

Response: Don't know.

Comment: Every broadcast/multi-cast source gets its own key. Once the AP you're talking to gets the newly generated key, it sends out message that says "come and get the new key". Issue on roaming – what happens if you get one of these messages when roaming?

Comment: Have many of the same problems with any solution.

Comment: Have to support mixed legacy+new systems. Need to switch over to use broadcast mechanism that the legacy system will support.

Comment: Try to reduce crypto complexity, since we have many other system problems. Separate crypto functions, know that they are secure.

Comment: Critical to identify the problems that we are trying to solve.

Comment: Performance issues. Are we creating more arcs/messaging? Centralized policy control at Louie. Correctness, security, performance. Look at performance early. Tge looked at modeling, not quantitative analysis.

Comment: A useful exercise to understand the security problems that are being solved. Even if this one piece never sees the light of day, understand basic problems. Move decision from Louie back to X, to simplify broadcast/multicast. What additional risks are introduced?

Response: Louie is a philosophical divergence from .1X. In unicast, crypto complexity has been reduced by a large amount. Adding key management decoupled from MAC layer.

Comment: We have mandated .1X, driving this logically to apply to IBSS.

Comment: Broad consensus within .11i that .1X is the horse we want to ride.

Chair: Recess until after dinner, 7pm.

2.6 Presentation – Tim Moore 02/328 – .1X Pre-authentication

Text has been incorporated into document 02/298.

.1X is a unicast message – Bernard's basic insight.

802.1X happens after association. Pre-auth to other APs via this initial connection.

It's completely optional. Take the hit for authentication when you roam.

If the AP lost the keys, then it will send an 802.11 de-authentication message.

APs must be on the same level 2 network; IETF looking at EAP over IP. Could leverage this.

APs must be able to do .1X before association. APs already handle this in some ways, handle 802.11 authentication before having an association id.

Comment: Does this mean that we don't use IAPP?

Response: Don't use it for security association. Use it to forward the .1X message.

Comment: How many APs to pre-authenticate with?

Response: Probably keep the best 2 APs. Current systems keep state for 30 minutes or so.

Comment: AP you're trying to associate with may not have the resources to support you.

Response: AP can chose to not respond.

2.7 Continuing discussion

Chair: Discussion on how to move forward on changes in document 298.

Comment: Would some of the changes cover the comments?

Response: Absolutely.

Chair: Lump-sum it, or take it one thing at a time?

Comment: Can see reasons for each approach.

Comment: Need more time to look at it.

Comment: Is there a document with the comments?

Reply: Yes, document 298.

Chair: Review of agenda: Submissions will point us into the direction we want to go in. Before going into comment resolution, are there changes we want to make based on the submissions? Give ourselves some more time to look at it. Make it as several motions. There are several others for which motions might be ready. Several sections called out by the editor. More than 1200 comments, including many that said "resolve the editor's comments". Once we've taken care of the bigger issues, then go to detailed comment resolution. What do we want to do for tonight? Think about any motions?

Comment: Submissions attempted solutions. How do we proceed?

Chair: For example, can make motions on the extended IV. Might want to socialize ahead of time.

Comment: Do we know how many comments are technical versus editoria?

Chair: The majority are technical. Giving you a feel for them.

Comment: Divide up into equal numbered subsections, send subgroups off to work this.

Chair: Does anyone have motions they'd like to bring?

Comment: Yes. How much more time do people want to review document 02/298?

Comment: Tomorrow at 1:00?

Comment: Tim will bring a motion forward tomorrow at 1:00 to accept the whole thing.

Comment: Have a proposal, to add a name for the AES based algorithm.

Motion:

Moved, to direct the Editor to amend the TGi draft by replacing occurances of "AES-OCB", where it refers to an RSN protocol, with "Strong Confidentiality and Robust Authentication Protocol", which

may be referred to as SCRAP where appropriate. Occurances of “AES-OCB” referring to the cryptographic algorithm invented by Phil Rogaway are not affected.

Moved by: Donald Eastlake

Second: Jesse Walker

Discussion:

Comment: I think this is a good idea. Get a new name.

Comment: Important to have a new name. Must we have acronym names? No. But probably they should be pronounceable.

Comment: Do we really want a name with the work “crap” in it?

Comment: This sounds almost demeaning.

Comment: Move to postpone until tomorrow?

Comment: WRAP - Wireless

Motion to amend to accept suggested changes, to Wireless Robust Authentication Protocol

Motion reads:

Moved, to direct the Editor to amend the TGi draft by replacing occurances of “AES-OCB”, where it refers to an RSN protocol, with “Wireless Robust Authentication Protocol”, which may be referred to as WRAP where appropriate. Occurances of “AES-OCB” referring to the cryptographic algorithm invented by Phil Rogaway are not affected.

Motion: Donald

Second: John

Discussion –

Comment: No mention of encryption.

Motions: 13-0-4 Motion passes

Move to replace “authentication” to “authenticated” – Don Eastlake

Second: Jesse

Discussion: None

Vote: 13-0-4

Main Motion:

Moved, to direct the Editor to amend the TGi draft by replacing occurances of “AES-OCB”, where it refers to an RSN protocol, with “Wireless Robust Authenticated Protocol”, which may be referred to as

WRAP where appropriate. Occurances of “AES-OCB” referring to the cryptographic algorithm invented by Phil Rogaway are not affected.

Motion passes: 16-0-2

Comment: Can anyone tell me how much more robust?

Comment: Infinite improvement. Both TKIP and WRAP have 128 bit keys. TKIP can theoretically be broken in 2^{30} , WRAP in 2^{64} . However, need to get the keying right in both cases.

Comment: Re-keying may not be sufficient?

Comment: Disagreement. Some believe it is adequate, some not.

Chair: Take time to prepare for tomorrow, Any objection to recessing to 1pm tomorrow.

No objection. Recessed until 1pm tomorrow.

3 Tuesday 1:00PM

Chair: Meeting called to order.

Chair: We are at the point where we had given people time to review 02/298.

Motion for Tim to work with Jesse to incorporate document 298, except for section 1.4.2, into TGi Draft 2.

Motion introduced: Tim Moore

Seconded: Jesse Walker

Discussion:

Comment: 1.4.2 addresses how to integrity check management messages. Isn't complete, so don't want to put it in yet.

Vote: 17-1-5 Motion passes

Motion to instruct the editor to define a new category of network, the Transient-Security Network (TSN), as an RSN that also supports pre-RSN equipment.

Motion introduced: Jesse Walker

Seconded: Tim Moore

Discussion:

Comment: Confused on what that it means. An AP with a legacy station?

Response: Equipment – legacy (WEP), and AP-TSN.

Vote: 19-0-9 Motion Passes.

Chair: Any other motions? Seeing none, discuss how to go forward. Suggest we go through and identify the comments that are addressed by doc 298, and the motion just passed. Then afterwards, identify the ones that are still open, and divide into groups.

Comment: Is there an overview of the comments?

Chair: See the comment document. There is nothing that says this is the comment summary. Then we need to categorize the ones that are remaining. Before we get started, Jesse how should we move forward. Have an access database. Take a 15 minute recess, then come back and deal with the comments.

Comment: Can't everyone get the access database?

Chair: comments are on the server. Will put Access db there to.

No objection to recess.

Return from recess, proceed with comment resolution, going through database of comments.

Comment: For editorial revisions. Need to provide more informative text to provide background, and references, together with where to find them. Perhaps add "required reading" list to each section.

Comments that are not resolved cover some of the following topics:

- 2264-BSS to IBSS switching – rules for association

- Lack of de-authentication at the MAC level.

- RSN definition

- AES Mode

- Key distribution protocols

- Interaction with 802.11e/QAP

Chair: Any objection to recessing until 7:00pm? No objection.

3.1 Tuesday Evening

Continued Comment Resolution.

No meeting time scheduled for Wednesday.

4 Thursday morning 8:00 AM

Comment: How to proceed to get new key descriptor from 802.1X?

Chair: Will check with Stuart to see if this needs to go to working group.

Chair: Result, Stuart suggests appointing chair as liaison to .1X

Chair: Opening notes. There is a .1X meeting next week. I'll be attending. Issue how to coordinate. I'll request to be a liaison between .1 and .11i on Friday. We'll be asking for a key descriptor (experimental); also some questions on state diagrams. This approach removed the need to generate letters, etc.

Also: Do we need an interim meeting? Don't think we do. There are some larger issues to discuss. Jesse will send out an e-mail listing the remaining issues to discuss. Then, can prepare submissions for the Vancouver meeting.

Comment: Shall we have additional conference calls?

Chair: Probably a good idea. Discuss at the end of the day when to schedule these.

Continued comment resolution:

Al Petrick – Announcements:

Reminder: electronic attendance.

Reminder: Tge has a new draft. It's on the server, look at it and give comments.

Reminder: Small group looking at operating rules. Welcome to join us.

Continued Comment Resolution. Some of the open issues include:

Deferred issue: 28 bits of IV insufficient: #309 – New submission needed, Jesse to discuss with Phil Rogaway. Also attempt to get definition of OCB algorithm in an IEEE document.

IBSS – unacceptable to member.

532 – Security policy

Unitdata to have association ids?

RSNE – what station does with it.

Disassociate frames being authenticated.

Longer KeyID field.

Process issue for .11 – data flow architecture across the subgroups

Multi-cast

4.1 Thursday morning 10:30am discusison

Discussion: Revisit the meaning of the motion to incorporate document 298

Comment: Does this mean that 298 is now normative?

Chair: Yes

Comment: Intend to flag new items.

Comment: Does this mean that flagged items need 75% to take them out?

Chair: Yes.

Comment: We've stumbled across an item like TSN that is new. Worth having a confirmation ballot on items like this.

Chair: TSN was a separate motion.

Comment: Its purpose was to give a new place to new normative functionality in the draft.

Chair: Paraphrase, you saw within 298, wanted to clarify that this is new functionality.

Comment: If everything else is clarification of existing, won't raise it. But if new material, will flag it.

Comment: Motion was unclear if chair and seconder disagreed.

Chair: If you incorporate 298, then someone wants to change it, the change will require 75% approval.

Comment: ok.

Comment: Think we as a group have been lax in our review of what is going into the draft. It's causing problems here. Procedurally how do we address this.

Chair: In any tg, 50% of people don't know what they're voting on. Not sure you can do anything procedurally about it. Does it happen here? Yes.

Comment: Need to have the line by line review of the draft. Need to do this before going to draft 3.

Chair: Further discussion? None.

Resume comment resolution. Some of the items discussed include:

Protection of management frames – need to discuss.

Applicability of FIPS algorithm to selection criteria. NIST has said that if a standards body adopts it, they will select it. Reject the comment?

Comment: This is backwards. We want to rely in NIST, not have them rely on us.

Comment: FIPS doesn't apply to these WLAN systems.

Comment: Need to understand its applicability, since we do get questions from the market on use of these systems and whether or not they meet FIPS.

Recess for lunch.

4.2 Thursday Afternoon Comment Resolution 1:00PM

Resume comment resolution.

Comment resolution – first pass completed. Editor will put a copy of the updated Access Database on the server.

Recess until 7:00 pm, continue then with presentations and planning for next meeting.

4.3 Thursday Evening

Chair: We had 3 presentations; then discuss next meetings/conference calls.

Comment: Have 2

Chair: OK, total of 4 presentations.

Carlos – 2

Stephan

Paul

4.3.1 Stefan Rommer, Mats Naslund (Ericsson) – Extra MIC for use in Public Access WAN

-Security between the AP and a WLAN serving node is important, Security in AP is important.

Operators are concerned about robust billing

Protect against packets on the wired side.

Alternatives:

-Extend .11i security association from mobile to the WSN (problems with fragmentation)

Let higher layers and/or other standards perform the needed functions, a layer 2 solution is preferred, 802.10 is not well supported.

Comment: Why is layer 2 desired?

Response: Closer to the hardware.

Comment: Would only apply to a single subnet

Comment: Wouldn't need vpn

Comment: Use proprietary solutions, not good for usability and market acceptance

4th option: Add needed functions to 802.11i; add another MIC, calculate over MSDU; AP would not verify the MIC, at LLC layer – 802.10.

Why specify in .11i?

- A single standardized WLAN solution will promote interoperability
- Possible to re-use existing 802.11i functions, e.g. the key management
- Possible to re-use existing algorithms

WSN acts as RADIUS Proxy and can extract the Master Key

A key for the new MIC can then be derived both at the mobile and at the WSN

Comment: Who is actually calculating the second MIC? The WSN.

Comment: Don't you have to tie the WSSN into the authentication process?

Response: Yes.

Comment: Single or two stage auth process?

Response: Single

Comment: Need to do 2 key distributions. They can't both know the same key otherwise can forge.

Comment: Why not put MIC on the end of the data packet? Would, want to standardize it.

Comment: Has no effect on the AP.

Comment: Has an effect on the terminal.

Comment: This is either an 802.10 or an IPSEC problem. In either case, has been solved.

Add MIC in the WSN, de encryption in the AP

MIC should be applied to the whole MSDU

TKIP = re-use

AES – not easy, encryption and auth tied.

CCM – add CBC-MAC in WSN.

But-problem with split of functions.

Conclusions: Public access sites need extended protection, robust billing requires at least integrity, MIC an option, .11i can provide it.

Comment: What is the real problem?

Response: Wired side protection. Asking for a change in the auth process to enable another node in the middle.

Comment: Don't trust the AP. Don't understand the whole trust model.

Comment: Just went through solution with Louie to look at current trust model.

Comment: Don't trust the link between the AP and the WSN. But want to send between the station and the WSN.

Comment: Sounds like a reasonable assumption to not trust the AP in public spaces.

Comment: Why? Difference between rogue APs and this.

Comment: Assuming service provider is providing service to hotspots, don't care who the hotspot provider is.

Comment: But have to set them up, have relationship with them.

Comment: Local site won't have IT department.

Comment: Seems like this problem has been solved – either 802.10 or IETF

Comment: This would be an option? Yes.

Comment: Billing is an application, application level solution.

Comment: Make security extensible so that extra bytes can be added. Will require an external application on the station side. Not sure we're gaining anything here.

4.3.2 Next presentation: Paul Lambert (02/362r2)

Test vectors that cover more than was in the spec: WEP, TKIP, AES-OCB, current with D2.0., PRF, key hierarchy,

PRF sample code.

Will update per Tim's document (298)

Is in the archive.

Comment: Cool!

Comment: Will put up r3 on the server, to fix formatting, number on the page. Will produce and R4 to include changes for this meeting. Took a long time to get the PRF right.

Mike Sabin did a lot of the work on this.

Comment: Can you do the test vectors for CCM?

Response: Yes, can add these.

Comment: Will try to connect the key generation to the encryption

Comment: How big is a nonce? Doesn't really matter, but need to specify an interoperable solution.

Comment: Is there value in the?

Response: Yes. Will continue to work this.

Comment: Straight ascii versus putting in a table.

Response: Ok, will look at doing this.

4.3.3 Next presentation: Carlos Rios 02/331

Postmortem Opinions on D2

Did Well/Badly/Not at all

-Need to address non-AS provisioned IBSS and simple BSS

-Need to address key management

Table of the consequences – draft rejected.

298 – still complex and incomprehensible. Will take many months to converge, concerned that this isn't a path to a standard.

Louie – the culmination of WLAN security, great idea, not fully fleshed out. Probably robust, not timely

Consider adjunct RSN – 02/360r1. Includes robust shared key solution for terminals which don't have 802.1X. Includes MAC layer management messages – optional for 298 challenged situations. Comprehensive, timely. Get something that will work this year.

Comment: was voted down, but 87 people voted yes.

Comment: If I was one of the 87, I'd be embarrassed. Danger that it would look good, but not work.

Comment: ARSN is a good name.

4.3.4 Next Presentation: Carlos Rios 02/360 – Adjunct RSN proposal

Doc 370 is the more descriptive text.

Simple Infrastructure Networks – no AS.

-No auth methods exist for IBSS or simple BSS, legacy auth us deprecated in favor of ULA

-Non 802.1X roaming is undefined; add IAPP PMK transport.

Comment: To make algorithms work, need to coordinate sequence spaces and IVs. How does ARSN do this? Exchange nonces, etc.

Response: Yes.

Comment: Short hand-off time for roaming, how is this accomplished?

Response: Don't use all of 802.1X. Just IAPP, assuming this is a few ms.

Comment: Skeptical of this. Measurements show 50ms (Bill Arbaugh). Microsoft has done measurements also.

Response: Might be tied to passive scanning.

End of presentation.

4.3.5 Closing Discussion

Chair: Bunch of stuff addressed by 298, by WRAP, also by Paul's test vectors. Many comments still to be addressed. Schedule a conference call when we have the list of un-resolved comments. Then come up with a plan to address remaining comments. Opinion from editor – when will the list be available?

Comment: Publish a list next week. Then up to people to present proposals.

Chair: Also put up the current version of the Access Database.

Comment: Ok. Will also produce a document.

Chair: Another week for folks to look at it.

Discussion: May 29, Wednesday, 8am Pacific/10Central/11 Eastern/5pm Netherlands

June 26th, Wednesday 8am Pacific/10Central/11 Eastern/5pm Netherlands

Chair: Any objection to adjourning for the week? None.

Meeting adjourned.

**IEEE P802.11
Wireless LANs**

Minutes of Wireless LAN Next Generation Standing Committee Meetings

Date: May 12-16, 2002

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Abstract

Minutes of the Wireless LAN Next Generation Standing Committee meetings held during the IEEE 802.11/15 Interim meeting in Sydney from May 12 through 16, 2002.

Executive Summary:

1. Judging from the attendance (79 signed-up) interest was again high
2. 19 Presentations were made on topics ranging from OFDM-HDR, Next Generation WLANs, WWLAN-WWAN-WPAN Interworking, UWB, Radio Resource Measurement, Multi-hop, High Data Rate WPANs [docs 11-02-294,308,9,10,12,20,33,34,35,36,37,38,39,45,55,58,59,71,85 and .15_SG3a-02-104 and 149]
3. Two motions to request the WG to form new study groups were passed:
 - a. to form a new IEEE 802.11 Study Group called Radio Resource Measurement (54,4,6)
 - b. to form a new IEEE 802.11 Study Group called the High Throughput Study Group (HTSG), (44,1)
4. .11 and .15 chairs will continue to discuss and consider formal response to ETSI invitation to participate in joint Wireless Interworking Group (WIG) meetings starting in September at Monterey.
5. Outstanding action item from previous meeting was noted: The WNG SC request the 802.11 WG to form a liaison with Cable Labs for the purpose of coordinating the use of 802.11 WLANs in DOCSIS cable modem systems. (64,0,4)
6. The closing plenary summary document is 02-352r0

The following names were on the sign-up sheet (79).

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Tuesday May 14, 8:00-10:00 AM

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1. Bruce Presented the morning's agenda (doc. 02-335r1)
 - a. Agenda for the week with edits was approved
 - b. BRAN#28 update (doc.02-296) by Erwin Noble on behalf of Erik Schylander
 - i. Request from BRAN made to hold joint meetings on WWAN-WLAN (Wireless Interworking Group=WIG) starting in Sept at Monterey
 - ii. Bob Heile noted that the discussion should include WPAN as well as WWAN and WLAN
 - iii. Richard Paine noted that we should be including the Telephone companies/service providers to a greater extent in the WWAN-WLAN IW (inter-working) discussions
 - iv. Straw Pole – Should WWAN-WLAN IW topic continue to be discussed passed (37,0,7)
 - v. .11 and .15 chairs will continue to discuss and consider formal response to the ETSI invitation to join WIG
 - c. MMAC Update doc. – Takashi Aramaki
 1. HDR – HiSWANa discussed within MMAC since late 2001; no action required to liaison letter from MMAC to 802.11 on HDR
2. March minutes were approved without comment
3. Outstanding action item from previous meeting was noted: The WNG SC request the 802.11 WG to form a liaison with Cable Labs for the purpose of coordinating the use of 802.11 WLANs in DOCSIS cable modem systems. (64,0,4)
4. Presentation #1 Bruce Kraemer, Intersil (doc. 02-335r1) - discussion of Goals for week and related Committees
 - a. Straw pole – To allocate a 2 hour time slot at the Vancouver Meeting devoted to next generation WLAN passed (40,1,14)
 - a. Call for contributions for this 2 hour session in Vancouver
 - b. Suggestion from the floor that the papers should concentrate on impediments as well as technologies
5. Presentation #2, Garth Hillman, AMD (doc.02-334r0) - 'WNG Status and Challenge'
6. Presentation #3, Jon Rosdahl, Micro Linear (doc 02-291r0) - 'Throughput Limits with Existing MAC' which carries on from 02-138r0 presented in St. Louis
 - a. 802.11a & HDR Throughput Limits given existing MAC
 - b. E.G., At infinite AIR (air interface rate) throughput limit is 75.24 Mbps for one TX and RX network
7. Presentation #4, Jon Rosdahl, Micro Linear (doc 02-309 r0) - 'Burst Transmission and Acks for HDR over 100 Mbps'
 - c. Burst Ack to multiple data frames after contention free pole (CFP) was presented as an example of a change to the existing MAC which appeared to be very beneficial

- d. New limit as data rate goes to infinity is 287.43 Mbps for one TX and RX network
- e. Reducing overhead generates significant benefits
- f. Jon feels our first goal should be to tweak existing MAC for the HR extension as this will give us the most immediate benefit.

Wednesday May 15, 1-5 PM

- 8. Presentation #5, Harry Worstell, AT&T (doc. 358r0) – Status Update on Radio Resource Measurement and announced the intention to present a motion at this session to form a Study Group on Radio Resource Measurement
- 9. Presentation #6, Simon Barber, Instant 802.Networks Inc. (doc, 359r0) – Monitoring 802.11 Networks
 - a. Many MIBs exist - .11, .1x, Bridge (not 802.11), .11d (country string)
 - b. What's missing
 - i. Associated Stations Tables
 - c. Goals
 - i. Security
 - ii. Management
 - iii. Automated sniffers
 - iv. Frequency Planning
- 10. Presentation #7a Richard Paine, Boeing (doc. 02-337r0) – presented a draft Radio Resource Measurement PAR for comment
- 11. Presentation #7b Richard Paine, Boeing (doc. 02-338r0) – presented a draft Radio Resource Measurement 6 Criteria for comment
- 12. Motion (385r0) (as finally amended) – To request the WNG Chair to request the 802.11 Working Group to form a Study Group for the purposes of writing a PAR and criteria to address Radio Resource Management to amend the published IEEE 802.11 Standard was made by Harry Worstell (AT&T) and seconded by Victoria Poncini (Microsoft)
 - a. Friendly amendment to replace 5 Criteria with Criteria was accepted without comment
 - b. Friendly amendment to remove (like RSSI) was made by Victoria Poncini and seconded by Colin Lanzl (Aware) was accepted without comment
 - c. Passed (54, 4, 6)
- 13. Presentation # 8 Albert Young, Ray Link (doc. 02-345r0) – Enabling Interworking between WWAN, WLAN, WPAN
 - a. Market = mobile Internet
- 14. Presentation # 9 Oliver Muelhens, Philips Research (doc. 02-333r0) – QoS Enabled Multi-hop meets High Data Rate
 - a. Multi-hop QoS WLANs – Infrastructure (i.e., cluster based), central control, range extension
 - b. Concluded with HDR means QoS enabled Multi-hop
- 15. Presentation #10 Richard Paine, Boeing (doc 02-336r0) – UWB Teleconference Summary
 - a. FCC also just changed Part 15 to reduce the number of required hops from 75 to 15 for frequency hopping phys and to eliminate the requirement for a 10dB processing gain from direct sequence radios

- b. FCC just passed very conservative rules (3-10 GHz and – 40 dBm) governing UWB radios
 - c. The – 40dBm and spectrum are not sufficient to implement a 100 Mbps WLAN based on UWB however given the FCC’s penchant for changing the rules it may be possible to implement a 100 Mbps WLAN in the near future
 - d. Concluded by saying that he planned to bring a motion to the WNG to ‘form a Study Group for investigating 100 Mbps WLAN technology’ at a future session of the WNG
 - e. Richard had prepared a draft Criteria (02-339) and PAR (02-338) for discussion
16. Presentation #11a Rick Roberts, Extreme Networks, (doc. 802.15_SG3a 02-149r0) – Applications/Requirements for next generation WPANs
 17. Presentation #11b Rick Roberts, Extreme Networks, (doc. 802.15_SG3a 02-104r0) – Technical Requirements for next generation WPANs
 18. Presentation #13 Sebastien Simoens, Motorola (doc. 02-312r0) - Need for .11a HDR Extension in Enterprise
 - a. Need for EN LANs increasing
 - b. IT managers see 100 Mbps as the magic rate
 - c. Many choices for
 - i. Phys – e.g. turbo codes, higher QAM OFDM, hybrid ARQ
 - ii. Coding – convolutional (K=7)
 - iii. Consider Peak as well as average throughput
 - iv. Very much in favour of formation of OFDM-HDR SG
 19. Presentation #14 Bruce Kraemer, Intersil (doc. 335r3) – Reviewed the process for forming a SG and then a TG.
 - a. Points of Contention/Scope of PAR will need to be discussed in the SG
 - b. SG typically takes 6 months
 - c. Simple motion is enough to launch SG
 - d. Comment – primary issue WAS availability of standards making resources
 20. John Terry, Nokia lead a discussion of the motion to form an OFDM High Rate Study Group
 21. Motion proposed (doc. 02-355r0) – to form a new IEEE 802.11 Study Group called the High Throughput Study Group (HTSG), to investigate the feasibility of providing throughputs greater than the existing 802.11 standard via physical layer specifications and, optionally, any enabling MAC enhancements. Upon confirmation of feasibility and per 802 operating rules, the HTSG shall draft a PAR and 6 Criteria to be submitted to the 802.11 WG.
 22. 4:45 PM Straw Pole on Motion passed – (34, 18)
 23. Motion to recess until 5PM to give ~ 15 minutes for the motion to be edited in subcommittee passed (26,3)
 24. Motion (doc. 02-355r0) – to form a new IEEE 802.11 Study Group called the High Throughput Study Group (HTSG), to investigate the feasibility of providing throughputs greater than the existing 802.11 standard. Upon confirmation of feasibility and per 802 operating rules, the HTSG shall draft a PAR and 6 Criteria to be submitted to the 802.11 WG. With the first HTSG meeting starting not earlier than the September 2002 session
 25. Motion to amend the main motion by “removing the last sentence” was made by Jon Rosdahl (Micro Linear) and seconded by Bill Carney (TI) failed (19,34)

- 26. Vote on main motion passed (44,1)
- 27. Motion to adjourn passed (44,1)

Thursday May 16, 6:30-9:30 PM

- 28. Joint Meeting with 802.18 Radio Regulatory Carl Stevenson presenting
 - a. RF Lighting at 2.4 – has reappeared
 - i. OET (office of Engineering and technology) has been contacted with 802 objections
 - ii. RF Lighting folks have been uncooperative
 - b. American Radio Relay League petition to the FCC has been objected to by 802
 - c. Safe harbour provision for Part 15 devices is being proposed to the FCC
 - d. HTSG may include a new Phy such as channel bonding which may have impact on radio regulatory. Carl was not aware of any limitations off the top of his head
 - e. Similarly UWB is a Phy candidate and there could be regulatory impact
 - f. Action – WNG should send Carl an email with a list of related questions
- 29. Presentation #15 Chris Ware, Motorola, (doc. 310r1) – Requirements for Home Networking
 - a. MAC needs evolving for the HE (home environment)
 - b. Many types of devices, many rates, many technologies, user installed, multiple hops, coexistence
 - c. Requirements
 - i. Scalable
 - ii. Power Constraints
 - iii. Multiple Hops
 - iv. Hybrid ARQ
 - v. TDD/TDMA seems appealing
 - vi. Zero Config
 - d. Concludes that BOTH Phy and MAC need upgrading
- 30. Presentation #16 Heejung Yu, ETRI (doc 02-294r1) – MIMO-OFDM Considerations
 - a. Model
 - b. Optimal Receiver
 - c. Zero Forcing Receiver \approx MMSE Receiver
 - d. Example
 - e. Simulation Environment (4x4 antennas)
- 31. Presentation # 17 Gunnar Nitsche, Systemonic, (doc. 320r0) - 1/4 Gbps WLANs
 - a. Rather than simply 2x sampling rate better to increase FFT from 64 to 128 pts
 - b. Also, include MIMO techniques
 - c. Also, could increase modulation

- d. Need then to use space –time codes
 - e. Altogether $2.25 \text{ (BW)} \times 1.5 \text{ (MIMO system)} \times 8/6 \text{ (higher modulation)} \Rightarrow 1/4 \text{ Gbps}$
32. Presentation #18 JimTomcik, Qualcomm (doc. 02-371r0) – Thoughts on HDR 802.11
- a. Service Drivers and Requirements
 - b. Service req'ts – Delay, Jitter, Guaranteed QoS, many users
 - c. Data Rates – voice (32 Kbps), audio (192 Kbps), video (1.2[MPEG1] – 35 Mbps [HDTV])
 - d. DCF Mode efficiency – graphic
 - e. PCF Mode efficiency – graphic
 - f. HCF Mode efficiency – graphic
 - g. Can reservation (slotted) based systems do better (e.g., HL2)? A – yes stays at ~80%
 - h. Comparison matrix
 - i. DCF, PCF, HCF - Still best effort
 - j. QoS easier in slotted systems
 - k. Hot Spot Applications can really use the added throughput and QoS
33. Presentation #19 Yasuhiko Inoue, NTT (doc. 308r0) – Next Gen Wireless LANs
- a. Basic Rate 100 Mbps with options of 2x and 4x
 - b. Target frequency is BOTH 2.4 and 5 GHz band [In Japan only 4 ch in 5.25-5.35 bands but 4.9-5.0 for outdoor use within 5 years]
 - c. Access control mechanism – how do we develop a new MAC Protocol
 - i. Extend existing MAC
 - ii. New MAC but with interoperability
 - iii. New MAC
 - d. Concludes - >100 Mbps, BOTH Bands, Backward Compatibility (not TDMA in Japan's 4 channels)
34. July IEEE 802.11 Plenary (Vancouver) Plans
- a. Organize Radio Measurement Study Group
 - b. Organize High Throughput Study Group
 - c. Review results of BRAN#29
 - d. Respond to MMAC Liaison letter
 - e. Response to ETSI IW request
 - f. Cable Labs Liaison
 - g. Longer Term WLAN
 - i. MAC
 - ii. ETSI/MMAC coordination
 - iii. Radio Regulations
35. Move to Adjourn – by Jon Rosdahl, seconded by Richard Paine

